

A detailed photograph of a Siemens industrial control cabinet. The cabinet is open, revealing a complex internal arrangement of electrical components. On the left, there are several rows of terminal blocks with numerous colored wires (red, blue, black) connected to them. In the center, there are two large, white, three-phase circuit breakers or contactors. To the right of these, there are more terminal blocks and a large, orange, flexible cable. On the far right, there is a smaller, blue, rectangular component, possibly a relay or a small motor, with its own set of wires. A black fan is visible on the right side of the cabinet. The Siemens logo is prominently displayed in the top left corner. The overall appearance is professional and industrial.

SIEMENS

www.usa.siemens.com/controls

2016 Product Catalog

Industrial Control



SIEMENS

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Superior design meets rugged performance

With Siemens Command 52 and BlackMax 30mm pilot devices, you can be confident in the ability to handle every situation.

www.usa.siemens.com/pushbuttons

With Siemens innovative technology and design for rapid installation, our complete range of oil tight Pilot Devices provides a solution that will be aesthetically and functionally impressive. The extensive portfolio is modular, well-proven in practice, and is 100% fit for industrial environments.

Whether the application requires Chrome or BlackMax, incandescent or LED, standard duty or hazardous location, plastic or glass – Siemens has done the work for you.

See Section 10 of this catalog.

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Things you should know about the 2014 Industrial Catalog

	This Catalog contains all selection and order-relevant data.	More information can be found on the on-line version of this catalog at www.usa.siemens.com/iccatalog
Delivery time (DT)	Preferred types are available from stock Normal quantities of the products are usually delivered within the specified time following receipt of an order. In exceptional cases, the actual delivery time may differ from that specified.	The delivery times specified here represent the state as of 1/2014. For up-to-the-minute information, please visit our Industry Mall website at www.usa.siemens.com/industrymall <i>Note: Delivery Time (DT) does not appear on all selection pages due to space constraints or coil voltage variations.</i>
► Preferred type A 9 to 10 working days B 11 to 13 working days C 14 to 23 working days D 24 to 38 working days X On request		
Price units (PU)	The price unit defines the number of units, sets or lengths to which the price and weight apply.	
Packaging sizes (PS)	The packaging size defines the number of units, sets or length, for outer packaging. Only the quantity defined by the packaging size or a multiple thereof can be ordered.	

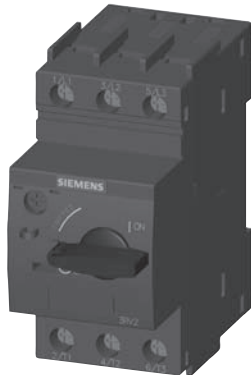
Symbols

On many selection pages in this catalog, you will find these symbols to aid in the quick identification of critical product features.

Connections	Combicon connection	
	Insulation piercing method	
	Fast Connect	
	Spring-type terminals	
	Flat connectors	
	Solder pin connections	
	Ring terminal lug connections	
	Screw terminals	
Types of coordination	Type of coordination "1"	
	Type of coordination "2"	
Distinguishing between units	Complete units	
	Modular system	
Support function	Configurator available in the Industry Mall	

Section 1

IEC Motor Starter Protectors



SIRIUS 3RV Motor Starter Protectors (MSPs) are built for a wide range of applications and meet the requirements of control users worldwide. Each MSP features a manual ON/OFF switch, a Class 10 adjustable bimetallic overload relay (Class 20 available in the two largest frame sizes), and magnetic trip elements for short circuit protection.

3RV10 / 20 MSPs can be used in a variety of applications:

- * Manual Motor Starter
- * Manual Self-Protected Combination Motor Controller, Type E
- * Combination Motor Controller Type F when combined with a 3RT contactor
- * IEC Circuit Breaker for export applications

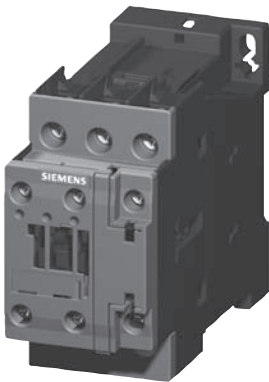
3RV17 / 27 are UL listed as a Circuit Breaker for branch circuit protection of both motor and non-motor loads

3RV28 is UL listed as a Circuit Breaker for transformer protection

3RV29 is an infeed system for quick installation of MSP and contactor assemblies

Section 2

IEC Contactors



High contact reliability, a narrow design, long life time, and the ability to operate under extreme conditions (up to 60° C), ensure that SIRIUS 3RT Contactors are suited for almost any application. A large array of easily installed, standard accessories may be used to customize the contactors for different applications.

3RT*0 – 3 Pole Standard

3RT12 – 3 Pole Vacuum

3RT*3 – 4 Pole with 4 normally open poles for switching Resistive loads (AC-1)

3RT*4 – 3 Pole for switching Resistive loads (AC-1)

3RT*5 – 4 Pole with 2 normally open & 2 normally closed poles

3RT*6 – 3 Pole for switching capacitors

3RA*9 – Contactor Accessories

3RA*3 – Reversing contactor assemblies

3TB5 – 3 Pole with true DC coils

3TC – 2 Pole for switching DC loads

3TF6 – 3 Pole Vacuum, 630 & 700A

Section 3

IEC Overload Relays



Complete motor protection can be achieved through the SIRIUS family of overload relays (OLR's).

3RU11 / 21 – Thermal OLR's, up to 100 A, are ambient compensated bimetallic in Trip Class 10

3RB20 / 30 – Solid State OLR's, up to 630 A, with an internal power supply and 4:1 FLA adjustment range in Trip Class 10 or 20

3RB21 / 31 – Features of the 3RB20 / 30 plus adjustable Trip Class 5 to 30, ground fault detection, and remote reset

3RB22 / 23 – Features of the 3RB21 / 31 plus status LED's and external power supply

3RB24 – Features of the 3RB23 plus communication via IO-Link

3UF7 – SIMOCODE pro intelligent motor protection is more than just a programmable overload relay. By linking the motor and automated control circuits, SIMOCODE allows for predictive and conditional maintenance on critical systems.

IEC Combination Starters

Section 4

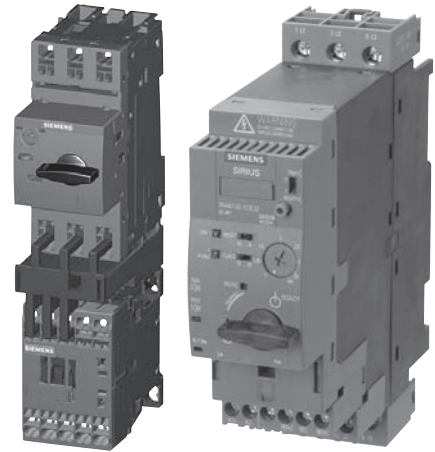
The SIRIUS 3RA1/2 Combination Starters consist of a pre-wired and mechanically connected 3RV MSP and 3RT contactor, allowing for quick installation of a complete branch circuit. The Non-Reversing or Reversing assemblies come on a Fast Bus mounting shoe or as a Panel Mount version.

The SIRIUS 3RA6 Compact Starters provide the functionality of an MSP, Contactor and Electronic Overload Relay in one easy to install housing, saving wiring and installation time. Available in both non-reversing and reversing starters that can be mounted on a Fast Bus shoe. The SIRIUS 3RA6 Infeed system further saves line side wiring in multiple motor panels.

3RA11 / 21 – Non-Reversing Combination Starters

3RA12 / 22 – Reversing Combination Starters

3RA6 – Compact Non-Reversing & Reversing Combination Starters



Fast Bus Power Distribution System

Section 5

The UL508A Fast Bus Multi-Motor Control System is a 3 phase insulated busbar system used to reduce wire connections and hole drilling when building control panels. Quickly mount Sirius 3RA combination starters and/or Siemens circuit breaker assemblies.

The Siemens Fast Bus system uses standard off-the-shelf components, with both domestic and international approvals, to allow for economical installation, compact panel designs, touch safe equipment, that allow for easy expansion and maintenance.

FB – Installation kits for quick ordering & installation

FBCB – Circuit breakers pre-assembled on Fast Bus adapter shoes

3RA – Combination starters for Fast Bus mounting (see section 4)

8US – Fast Bus components for Field assembly



Hybrid Motor Starters

Section 6

SIRIUS 3RM1 motor starters are compact devices with a width of 22.5 mm, combining a large number of functions in a single unit. They consist of combinations of relay contacts, power semiconductors (hybrid technology), and a solid state overload relay for operational switching of three phase motors up to 3 HP @ 480 V.

Hybrid technology provides reduced size, lower heat losses and longer service life in motor starter applications. Even the reversing units are only 22.5mm wide.

3RM10 – Non-reversing starters

3RM11 – Non-reversing starters with safety related shutdown

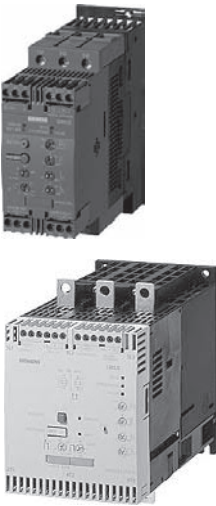
3RM20 – Reversing starters

3RM21 – Reversing starters with safety related shutdown



Section 7

Solid State Soft Starters



SIRIUS Solid State Soft Starters are designed to ramp up your efficiency at every turn. Easy to specify, integrate, operate, and maintain, our controls fulfill your need for more thoughtful system-wide solutions. With innovations, such as 2 phase control up to 300HP@ 480V to a high end Profibus DP capable soft starter, Siemens is your trusted source for soft start control.

3RW30 – Soft Starters in compact frame sizes up to 75HP for standard applications

3RW40 – A compact Soft Starter from 7.5 to 300HP, with built-in bypass contacts, overload protection and device self protection

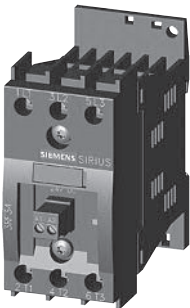
3RW44 – A high feature Soft Starter offering, from 15HP to 900HP, with built-in bypass contacts, overload protection, torque control functionality, multiple parameter settings, braking and slow speed capability, programmable inputs and outputs, and kick start and multiple starting and stopping modes

Class 73 – Non-Combination Enclosed Soft Starters

Class 74 – Combination Enclosed Soft Starters with circuit breaker or fusible disconnect

Section 8

Solid State Switching Devices



Designed for high operating switching frequency the Sirius Solid State Relays and Contactors feature a long lifespan of rugged reliability in adverse conditions, quiet operation, compact size, and snap on function modules for convenient flexible use.

3RF20 – 1-Phase Relays in a 45mm wide “hockey-puck” design

3RF21 – 1-Phase Relays in a 22.5mm narrow width design

3RF22 – 3-Phase Relays in a 45mm wide design

3RF23 – 1-Phase Contactors, a 22.5mm wide relay mounted to a heat sink

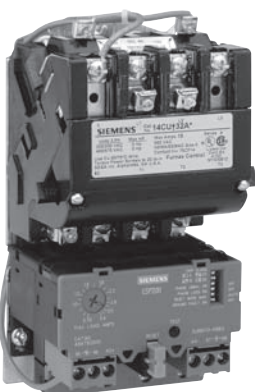
3RF24 – 3-Phase Contactors, a 45mm wide relay mounted to a heat sink

3RF29 – Function Modules, such as, converters, load monitors and power controllers

3RF34 – 3-Phase non-reversing and reversing Contactors for switching

Section 9

General Purpose Control



Siemens NEMA controls are built rugged to withstand the most severe and demanding industrial and continuous duty commercial applications. Siemens offers the most complete and diverse product line in the world of NEMA. This includes standard full NEMA sizes and motor matched half sizes exclusive to Siemens. All are available as open or enclosed devices with a wide selection of accessories and spare parts.

Manual Starters & Switches

Non-Reversing & Reversing Starters & Contactors

Multi-Speed Starters

Reduced Voltage Starters – Autotransformer and Wye-Delta

Combination Starters

Pump Controllers

Overload Relays – Solid State & Bimetallic with Replaceable Heaters

Current Sensitive Relays

Lighting & Heating Contactors

Control Power Transformers

Pilot Devices

Section 10

Siemens offers an extensive array of Pilot Devices and Signal Columns for a wide variety of applications.

3SB2 – 16mm SIRIUS Pilot Devices for applications where panel space is a premium

3SU1 – 22mm SIRIUS ACT Pilot Devices offer maximum flexibility, industry best time install savings and environmental ratings in round-metal and round-plastic versions

Class 50 – Standard Duty Control Stations

Class 52 – 30mm is the classic pushbutton design for the NEMA markets offering both standard die cast metal and the ultra rugged BLACK MAX for corrosion resistant applications

Class 51 – 30mm in NEMA 7 & 9 for hazardous locations

8WD – Signal Columns offer twist and connect technology in both 50mm and 70mm diameter styles. Single element signal beacons add additional options for OEMs and panel builders



Function Relays

Section 11

The SIRIUS family of compact, DIN rail mountable function relays offers complete solutions for monitoring, switching, interfacing and timing applications.

3RN – Thermistor Motor Protection

3RP – Solid State Timing with single or multiple timing functions

3RS10 / 20 – Temperature Monitoring in solid, liquid and gaseous media

3RS17 – Interface Converters

3RS18 – Relay Interfaces

3TG10 – Compact Power Relays/Contactors

3TX70 – Interface Relays & Semiconductor Interfaces

3TX71 – Plug-in Relays & Timers

3UG4 – Line Monitoring of voltage and insulation or load monitoring of Current & Cos Phi, Level Monitoring of conductive liquids, and under speed monitoring



Terminal Blocks

Section 12

For the wiring of machines and control systems, Siemens Terminal Blocks meet or exceed the requirements of CSA, IEC, NEMA, UL, VDE and other international standards. Meeting these requirements, combined with worldwide acceptability and availability, enables Siemens Terminal Blocks to be used domestically, as well as, in equipment which will be exported.

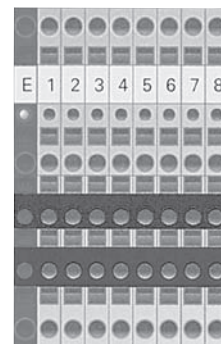
8WA1 / 8WH1 – Terminals with Screw Connection

8WH2 – Terminals with Spring-Loaded Connection

8WH3 – Terminals with Insulation Displacement Connection

8WH5 – Terminals with Combination Plug-in Connection

8WH6 – Terminals with iPo Plug-in and Installation Connections



Section 12 contains the 'Table of Contents' of the Terminal Block Supplemental Catalog, Order No. PDCA-TERMB-1013; Labeling Plates for Ink Plotter System; and, Special Label Instructions for 8WA terminal block labeling plate inscriptions.

Section 13

Safety Systems



Siemens Switches and Machine Safety devices provide the means for protecting workers and equipment where hazardous conditions exist. Compliance with NEMA, OSHA and international standards (IEC) are a critical requirement for machine OEMs and end users. Siemens has provided safety relay and contactor products to the international community for almost 50 years.

- 3SB38** – Two-Hand Control Stations
- 3RK3** – Modular Safety System (MSS)
- 3SE03** – North American (NEMA) Limit Switches
- 3SE5** – International (IEC) Limit Switches
- 3SE5 / 3SE2** – Interlock Switches & Hinge Switches
- 3SE6** – RFID Non-Contact Safety Switches & Magnetic Monitoring Systems
- 3SE7** – Cable-Operated Switches
- 3SK1** – Modular Safety Relays
- 3TK28** – Safety Relays with special functions.

Section 14

AS-Interface & IO-Link Systems



Actuator-Sensor Interface is the simple and effective networking system for the field level. It is extremely rugged even under the toughest of conditions. With compatible safety components, AS-Interface offers safety applications according to Safety Category 4. AS-Interface is easily linked to higher-level networks for a complete automation solution — simple, safe and fast in the field.

IO-Link is an open communication standard based on point-to-point connection between a Master and up to 4 devices. For an OEM wiring multiple motor starters, IO-Link technology can greatly reduce control cabinet wiring for motor starters while increasing diagnostics. For End Users, IO-Link provides a cost effective way in to monitor common analog values such as motor current, power consumption, temperature and voltage without adding an additional network.

Section 15

Programmable Relays & Power Supplies



The LOGO! Programmable Relay is a compact, easy to use and low cost solution for simple control tasks. Functions can be changed at the touch of a button through the integrated operator panel or remote display.

SITOP offers a broad offering of compact single- and 3-phase switched mode power supplies and 24VDC power security components, which provide reliable solutions for the most common power interruptions, helping to minimize downtimes and increase the efficiency of production.

SCALENCE Managed and Unmanaged Industrial Ethernet Switches with up to eight RJ45 ports.

- 6ED1** – LOGO! Programmable Relays
- 6EP1** – SITOP Power Supplies and Power Security Components
- 6EK5** – SCALENCE Industrial Ethernet Switches

Control Circuit Protection

Section 16

Siemens UL 489 miniature circuit breakers and accessories are designed to provide branch circuit and feeder protection.

Siemens UL 1077 Supplementary Protectors are designed to provide additional protection where branch circuit protection is already provided or, not required at all. Since Siemens Supplementary protectors are made to trip faster than other components, they are able to provide additional protection for more sensitive devices inside a panel.

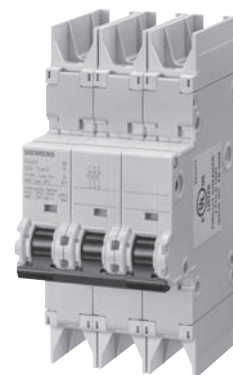
5SJ4 – Miniature Circuit Breakers up to 480Y / 277 VAC, 63A

5SY – High feature Supplementary Protectors from 0.3 to 63A

5SP – High amperage Supplementary Protectors from 80 to 125A

3NW7 – Cylindrical Fuse Holders meeting UL 512 and IEC 60269-1, -2, -3

3NC1 – Open type Cylindrical Fuse Holders meeting UL 512



Circuit Breakers

Section 17

Siemens offers a full line of interchangeable and non-interchangeable thermal-magnetic trip circuit breakers with a wide variety of interrupting ratings from 10KAIC to 200KAIC. These circuit breakers are available with multi-functional internal accessories, which are field installable on most breakers, and a full line of external accessories. Electronic trip circuit breakers are available for 150A through 1600A breakers.

Molded Case Circuit Breakers

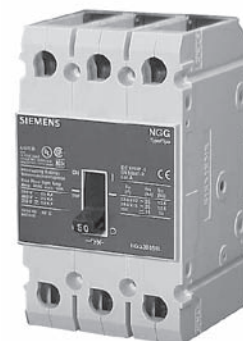
BQ and QJ – 240VAC Breakers

CQD – 480VAC Breakers

GG, Sentron, and VL – 600VAC Breakers

Insulated Case and Power Circuit Breakers

WL frame – 600VAC



Switches

Section 18

Siemens offers a complete line of both enclosed and open style switches to meet a wide range of applications.

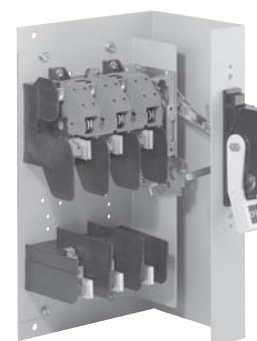
HF & HNF – Heavy Duty Safety Switches with Side Mounted Operating Handle

3LD2 – Rotary Switches in Non-metallic Enclosures

VBF & VBNF – Open Switches with Flange Mounted Operating Handle

MCS – Open Switches with Flange or Rotary Operating Handle

CFS – Open Compact Fusible Switches with Rotary Operating Handle



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SIRIUS 3RV motor starter protectors up to 100 A



Size S00, S0



For motor protection CLASS 10

Selection and ordering data

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For motor protection CLASS 20

Selection and ordering data

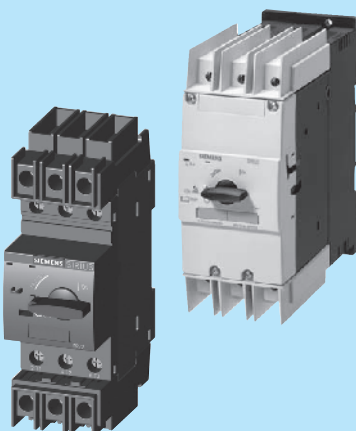
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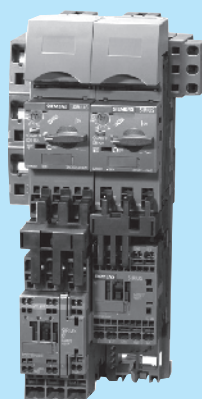


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SIRIUS 3RV29 infeed system

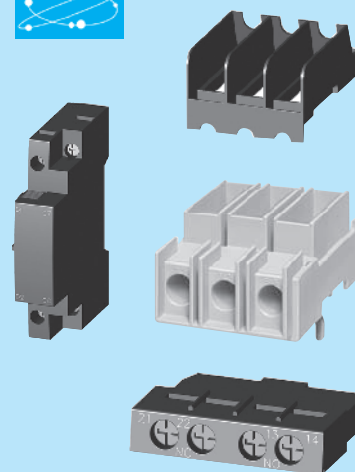


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3RV MSP auxiliaries and accessories

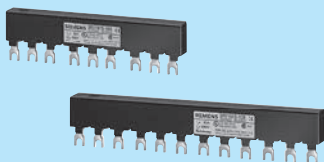


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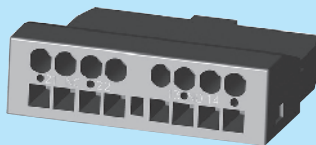


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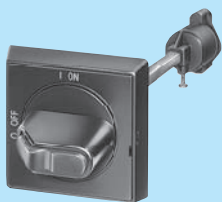


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3RV Motor Starter Protectors

For Motor Protection


3RV20 Class 10
up to 40A

SIRIUS



Description	Ordering Information
<p>The 3RV20x MSP's are UL approved as Self Protected Combination Motor Controllers which are also called Type E. In this application, all the required functions for a motor branch are provided in one device: disconnect, short circuit protection, motor control and overload protection. A type E terminal adaptor is required. The 3RV20x MSP's are also approved for use as follows:</p> <ul style="list-style-type: none"> Manual Motor Controller: Motor starter, motor disconnect, control and overload—protection. Group Installation: Motor starter only, motor disconnect, control and overload protection. Tap conductor Protection in Group Installation acc. NEC: Motor starter only; motor disconnect, control and overload protection. <p>When the 3RV20x is used with one of the 3 above mentioned approvals, the 3RV20x can be installed downstream of one circuit breaker or fuse set.</p> <p>For more detailed application information and rules how to apply, size and rate the 3RV20x in control panels in general, in group installations or in accordance to international IEC standards visit our website: www.usa.siemens.com/controlpaneldesign</p>	<ul style="list-style-type: none"> ON/OFF rotary handle with lockout and visible trip indication. Adjustment dial for setting to motor FLA. Class 10 overload trip characteristics. Short circuit trip at 13 times the maximum setting of the FLA adjustment dial. Short circuit current rating: Ambient compensated up to 140° F (applies to side by side mounting). Phase loss sensitivity. Test trip function. Terminal versions: screw, spring, ring lug. Auxiliaries and Accessories see pages 1/7–1/17. General Information see pages 1/29–1/32. Technical Data see pages 1/18–1/28. Dimensions see page 1/33.

Note: Select MSP by motor Full Load Amperes. Horsepower ratings are for reference only.

Illustration	FLA Adjustment Range [A]	Single-Phase HP Ratings		Three-Phase HP Ratings ¹⁾				Instantaneous short circuit release [A]	UL short-circuit breaking capacity @ 480V [kA]	Size S00 ^{2) 4)}	Size S0 ^{2) 4)}
		115V	230V	200V	230V	460V	575V			Order Number	Order Number
	0.11-0.16	—	—	—	—	—	—	2.1	65	3RV2011-0AA●●	—
	0.14-0.2	—	—	—	—	—	—	2.6	65	3RV2011-0BA●●	—
	0.18-0.25	—	—	—	—	—	—	3.3	65	3RV2011-0CA●●	—
	0.22-0.32	—	—	—	—	—	—	4.2	65	3RV2011-0DA●●	—
	0.28-0.4	—	—	—	—	—	—	5.2	65	3RV2011-0EA●●	—
	0.35-0.5	—	—	—	—	—	—	6.5	65	3RV2011-0FA●●	—
	0.45-0.63	—	—	—	—	—	—	8.2	65	3RV2011-0GA●●	3RV2021-0GA●●
	0.55-0.8	—	—	—	—	—	—	10	65	3RV2011-0HA●●	3RV2021-0HA●●
	0.7-1	—	—	—	—	—	1/2	13	65	3RV2011-0JA●●	3RV2021-0JA●●
	0.9-1.25	—	—	—	—	1/2	1/2	16	65	3RV2011-0KA●●	3RV2021-0KA●●
	1.1-1.6	—	1/10	—	—	3/4	3/4	21	65	3RV2011-1AA●●	3RV2021-1AA●●
	1.4-2	—	1/8	—	—	3/4	1	26	65	3RV2011-1BA●●	3RV2021-1BA●●
	1.8-2.5	—	1/8	1/2	1/2	1	1 1/2	33	65	3RV2011-1CA●●	3RV2021-1CA●●
	2.2-3.2	1/10	1/4	1/2	3/4	1 1/2	2	42	65	3RV2011-1DA●●	3RV2021-1DA●●
	2.8-4	1/8	1/8	3/4	3/4	2	3	52	65	3RV2011-1EA●●	3RV2021-1EA●●
	3.5-5	1/8	1/2	1	1	3	3	65	65	3RV2011-1FA●●	3RV2021-1FA●●
	4.5-6.3	1/4	1/2	1	1 1/2	3	5	82	65	3RV2011-1GA●●	3RV2021-1GA●●
	5.5-8	1/4	1	2	2	5	5	104	65	3RV2011-1HA●●	3RV2021-1HA●●
	7-10	1/2	1 1/2	2	3	5	7 1/2	130	65	3RV2011-1JA●●	3RV2021-1JA●●
	9-12.5	1/2	2	3	3	7 1/2	10	163	65	3RV2011-1KA●●	3RV2021-1KA●●
	11-16	1	2	3	5	10	—	208	65	3RV2011-4AA●●	3RV2021-4AA●●
	14-20	1 1/2	3	5	5	10	—	260	65	—	3RV2021-4BA●●
	17-22	1 1/2	3	5	7 1/2	15	—	286	65	—	3RV2021-4CA●●
	20-25	2	3	5	7 1/2	15	—	325	65	—	3RV2021-4DA●●
	23-28	2	5	7 1/2	10	20	—	364	50	—	3RV2021-4NA●●
	27-32	2	5	7 1/2	10	20	—	400	50	—	3RV2021-4EA●●
	30-36 ³⁾	3	5	10	10	25	—	432	12	—	3RV2021-4PA●●
	34-40 ³⁾	3	7 1/2	10	10	30	—	480	12	—	3RV2021-4FA●●

Screw terminals, no auxiliary: ●● = 10

Screw Terminals, with 1NO/1NC Aux: ●● = 15

Spring terminals, no auxiliary: ●● = 20

Spring Terminals, with 1NO/1NC Aux: ●● = 25

Ring Lug Terminals, no Auxiliary: ●● = 40

1) Select motor starter protector by motor full load amps. Horse power ratings for reference only.

2) The motor starter protectors rated up to 32 A can be used as manual motor controllers or as Type E combination motor controllers. For use as a Type E combination motor controller, a Type E terminal is required. See accessories page 1/10.



3) These products are NOT certified as Type E combination motor controllers. They can only be used as manual motor controllers.

4) 3RV2 MSP's can only be used with Innovations contactors and accessories



Description	Ordering Information
<p>The 3RV203 / 104 MSP's are UL approved as Self Protected Combination Motor Controllers which are also called Type E. In this application, all the required functions for a motor branch are provided in one device: disconnect, short circuit protection, motor control and overload protection. A type E terminal adaptor is required for all S2 frame 3RV2031 above 45A and all S2 frame 3RV2032 as well as for all S3 frame motor starter protectors.</p> <p>The 3RV203 / 104 MSP's are also approved for use as follows:</p> <ul style="list-style-type: none"> – Manual Motor Controller: Motor starter, motor disconnect, control and overload protection. – Group Installation: Motor starter only, motor disconnect, control and overload protection. – Tap conductor Protection in Group Installation acc. NEC: Motor starter only; motor disconnect, control and overload protection. <p>When the 3RV203 / 104 is used with one of the 3 above mentioned approvals, they can be installed downstream of one circuit breaker or fuse set.</p> <p>For more detailed application information and rules how to apply, size and rate these MSP's in control panels in general, in group installations or in accordance to international IEC standards visit our website: www.usa.siemens.com/controlpaneldesign</p>	<ul style="list-style-type: none"> ▶ ON/OFF rotary handle with lockout and visible trip indication. ▶ Adjustment dial for setting to motor FLA. ▶ Class 10 overload trip characteristics. ▶ Short circuit trip at 13 times the maximum setting of the FLA adjustment dial. ▶ Short circuit current rating: ▶ Ambient compensated up to 140° F (applies to side by side mounting). ▶ Phase loss sensitivity. ▶ Test trip function. ▶ Auxiliaries and Accessories see pages 1/7–1/17. ▶ General Information see pages 1/29–1/32. ▶ Technical Data see pages 1/18–1/28. ▶ Dimensions see page 1/33.

Note: Select MSP by motor Full Load Amperes. Horsepower ratings are for reference only.

Illustration	FLA Adjustment Range [A]	Single Phase HP rating ¹⁾		3 Phase HP Rating ¹⁾				Inst. Short-Circuit Release [A]	UL AIC (480V) [kA] ⁶⁾	Trip Class 10	Trip Class 20
		115V	240V	200V	230V	460V	575V			Order Number ⁴⁾	Order Number ⁴⁾
 	3RV203 Frame Size S2										
	9.5 - 14	1.5	3	5	5	10	15	208	65	3RV2031-4SA10	3RV2031-4SB10
	12 - 17	1.5	3	5	7.5	15	15	260	65	3RV2031-4TA10	3RV2031-4TB10
	14 - 20	1.5	3	7.5	7.5	15	20	260	65	3RV2031-4BA10	3RV2031-4BB10
	18 - 25	2	5	7.5	10	20	25	325	65	3RV2031-4DA10	3RV2031-4DB10
	22 - 32	3	5	10	10	25	30	416	65	3RV2031-4EA10	3RV2031-4EB10
	28 - 36	3	7.5	15	15	30	40	520	65	3RV2031-4PA10	3RV2031-4PB10
	32 - 40	3	7.5	15	15	30	40	585	65	3RV2031-4UA10	3RV2031-4UB10
	35 - 45	3	10	15	15	40	50	650	65	3RV2031-4VA10	3RV2031-4VB10
	42 - 52	5	10	15	20	40	50	741	65	3RV2031-4WA10	3RV2031-4WB10
	49 - 59	5	15	20	25	50	60	845	30	3RV2031-4XA10	3RV2031-4XB10
	54 - 65	5	15	20	25	50	60	845	30	3RV2031-4JA10	3RV2031-4JB10
	3RV104 Frame Size S3										
	28 - 40	3	7.5	15	15	30	40	520A	65	3RV1041-4FA10	3RV1042-4FB10
	36 - 50	5	10	15	20	40	50	650A	65	3RV1041-4HA10	3RV1042-4HB10
	45 - 63	5	15	20	25	50	60	819A	65	3RV1041-4JA10	3RV1042-4JB10
	57 - 75	7.5	15	25	25	60	75	975A	65	3RV1041-4KA10	3RV1042-4KB10
	70 - 90	10	20	30	30	75	100 ³⁾	1170A	65	3RV1041-4LA10	3RV1042-4LB10
	80 - 100	10	25	40	40	75	100 ³⁾	1235A	65	3RV1041-4MA10	3RV1042-4MB10

1) Select motor starter protector by motor full load amps. Horse power ratings for reference only.

2) Size S2 and S3 are listed as type E combination motor controllers. For required Type E terminals see page 1/10. 3RV2031 MSP's with a current setting limit of 45A or less do not require a type E terminal and fulfill the spacing requirements of UL508.

3) Shaded ratings apply for group installation only. These ratings do not apply as UL listed manual combination starters.

4) Pre-assembled motor starter protector and transverse auxiliary switch with 1NO + 1NC is available. Replace the last digit of the order no. with a "5".

5) 3RV1 MSP's can only be used with 3RT1 contactors and accessories. 3RV2 MSP's can only be used with 3RT2 contactors and accessories.

6) For 100kA SCCR rated MSP's, change the part number from 3RV2031 to 3RV2032. (applies to S2 frame only through 65A).

Refer to pages 1/18 to 1/20 when using an MSP in a Manual Motor Starter or a Manual Self-Protected Combination Motor Controller.

3RV Circuit Breakers

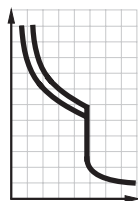
UL 489

3RV
up to 70 A

SIRIUS



Selection and ordering data



Rated Current ¹⁾ [A]	Thermal overload release (non-adjustable) [A]	Short Circuit breaking capacity [kA]			For Motor Protection ²⁾			For Transformer Protection ³⁾		
		480 VAC	480Y/277VAC	600Y/347VAC	Instantaneous Over Current Release [A]	Order Number (Screw Terminals)	Weight [kg]	Instantaneous Over Current Release [A]	Order Number (Screw Terminals)	Weight [kg]

Innovations Frame Size S00⁴⁾

0.16	0.16	—	65	10	2.1	3RV2711-0AD10	0.390	3.3	3RV2811-0AD10	0.390
0.2	0.2	—	65	10	2.6	3RV2711-0BD10	0.390	4.2	3RV2811-0BD10	0.390
0.25	0.25	—	65	10	3.3	3RV2711-0CD10	0.390	5.2	3RV2811-0CD10	0.390
0.32	0.32	—	65	10	4.2	3RV2711-0DD10	0.390	6.5	3RV2811-0DD10	0.390
0.4	0.4	—	65	10	5.2	3RV2711-0ED10	0.390	8.2	3RV2811-0ED10	0.390
0.5	0.5	—	65	10	6.5	3RV2711-0FD10	0.390	10	3RV2811-0FD10	0.390
0.63	0.63	—	65	10	8.2	3RV2711-0GD10	0.390	13	3RV2811-0GD10	0.400
0.8	0.8	—	65	10	10	3RV2711-0HD10	0.390	16	3RV2811-0HD10	0.450
1	1	—	65	10	13	3RV2711-0JD10	0.450	21	3RV2811-0JD10	0.450
1.25	1.25	—	65	10	16	3RV2711-0KD10	0.450	26	3RV2811-0KD10	0.460
1.6	1.6	—	65	10	21	3RV2711-1AD10	0.460	33	3RV2811-1AD10	0.460
2	2	—	65	10	26	3RV2711-1BD10	0.460	42	3RV2811-1BD10	0.460
2.5	2.5	—	65	10	33	3RV2711-1CD10	0.460	52	3RV2811-1CD10	0.460
3.2	3.2	—	65	10	42	3RV2711-1DD10	0.460	65	3RV2811-1DD10	0.460
4	4	—	65	10	52	3RV2711-1ED10	0.450	82	3RV2811-1ED10	0.460
5	5	—	65	10	65	3RV2711-1FD10	0.460	104	3RV2811-1FD10	0.460
6.3	6.3	—	65	10	82	3RV2711-1GD10	0.460	130	3RV2811-1GD10	0.460
8	8	—	65	10	104	3RV2711-1HD10	0.460	163	3RV2811-1HD10	0.460
10	10	—	65	10	130	3RV2711-1JD10	0.460	208	3RV2811-1JD10	0.460
12.5	12.5	—	65	10	163	3RV2711-1KD10	0.460	260	3RV2811-1KD10	0.460
15	15	—	65	—	208	3RV2711-4AD10	0.470	286	3RV2811-4AD10	0.470

Innovations Frame Size S0⁴⁾

20	20	—	50	—	260	3RV2721-4BD10	0.514	325	3RV2821-4BD10	0.516
22	22	—	50	—	286	3RV2721-4CD10	0.516	364	3RV2821-4CD10	0.528

Classic Frame Size S3⁵⁾

10	10	65	—	20	150	3RV1742-5AD10	0.460	—	—	—
15	15	65	—	20	225	3RV1742-5BD10	0.460	—	—	—
20	20	65	—	20	260	3RV1742-5CD10	0.460	—	—	—
25	25	65	—	20	325	3RV1742-5DD10	0.460	—	—	—
30	30	65	—	20	390	3RV1742-5ED10	0.460	—	—	—
35	35	—	65	20	455	3RV1742-5FD10	0.460	—	—	—
40	40	—	65	20	520	3RV1742-5GD10	0.460	—	—	—
45	45	—	65	20	585	3RV1742-5HD10	0.460	—	—	—
50	50	—	65	20	650	3RV1742-5JD10	0.460	—	—	—
60	60	—	65	20	780	3RV1742-5LD10	0.460	—	—	—
70	70	—	65	10	910	3RV1742-5QD10	0.460	—	—	—

1) 100 % rated value acc. to UL 489 and IEC 60947-2 (100 % rated breaker).

2) Circuit breakers for system protection of motor and non-motor loads. Requires use of separate overload protection for motor applications.

3) Circuit breakers for system and transformer protection according to UL/CSA. Specially designed for transformers with high inrush current.

4) Transverse and lateral auxiliary switches can be ordered separately (see "Mountable accessories").

5) Transverse auxiliary switches must not be mounted. Lateral auxiliary switches can be ordered separately (see "Mountable accessories").

Refer to page 1/21 when using as upstream protection of a Manual Motor Controller or a Manual Motor Controller Suitable for Tap Conductor Protection in Group Installations.

Selection and ordering data

		Type	Version	W i d t h	Classic		Innovations			
					Fits 3RV1 Frame Size	Screw Connection Order No.	Fits 3RV2 Frame Size	Screw Connection Order No.		
Auxiliary switches ³⁾					mm	Classic		Innovations		
		Transverse auxiliary switches	1 CO 1 NO + 1 NC 2 NO		S3	3RV1901-1D 1) 3RV1901-1E 1) 3RV1901-1F	S00, S0, S2	1), 2) 3RV2901-1D 1) 3RV2901-1E 1) 3RV2901-1F		
			Solid-state compatible, transverse auxiliary switches for use in dusty atmosphere and in electronic circuits with low operating currents	1 CO		S3	3RV1901-1G	S00, S0, S2	3RV2901-1G	
		Covering caps for transverse auxiliary switch slots (pack of 10)			S3	3RV1901-0H	S00, S0, S2	3RV2901-0H		
		Lateral auxiliary switches (side mount)	1 NO + 1 NC	9	S3	1) 3RV1901-1A	S00, S0, S2	1), 2) 3RV2901-1A		
			2 NO	9		1) 3RV1901-1B		1) 3RV2901-1B		
			2 NC	9		1) 3RV1901-1C		1) 3RV2901-1C		
Width = 9 mm			2 NO + 2 NC	18		3RV1901-1J		3RV2901-1J		
Signaling switch ⁴⁾						Classic		Innovations		
		Signaling switch (side mount) Individual tripped and short-circuit signaling Width = 18 mm	1 NO + 1 NC each	18	S3	3RV1921-1M	S00, S0, S2	1), 2) 3RV2921-1M		
Auxiliary releases ⁵⁾						Classic		Innovations		
		Undervoltage releases (side mount) Width = 18 mm	DC 24 V		S3	3RV1902-1AB4	S00, S0, S2	3RV2902-1AB4		
			AC 50 Hz 24 V 110 V — 230 V 400 V 415 V 500 V	AC 60 Hz — 120 V 208 V 240 V 440 V 480 V 600 V	S3	3RV1902-1AB0 3RV1902-1AF0 3RV1902-1AM1 3RV1902-1AP0 3RV1902-1AV0 3RV1902-1AV1 3RV1902-1AS0	S00, S0, S2	3RV2902-1AB0 3RV2902-1AF0 3RV2902-1AM1 3RV2902-1AP0 3RV2902-1AV0 3RV2902-1AV1 3RV2902-1AS0		
		Undervoltage releases with leading	230 V 400 V 415 V	240 V 440 V 480 V				S00, S0, S2	1) 3RV2922-1CP0 1) 3RV2922-1CV0 1), 2) 3RV2922-1CV1	
			auxiliary contacts 2 NO (side mount) Width = 18 mm	230 V 400 V 415 V	240 V 440 V 480 V	S3	3RV1922-1CP0 3RV1922-1CV0 3RV1922-1CV1	S00, S0, S2	1) 3RV2922-1CP0 1) 3RV2922-1CV0 1), 2) 3RV2922-1CV1	
		Shunt releases (side mount) Width = 18 mm	AC 50/60 Hz 100% ON⁶⁾ 20-24 V 90-110 V 210-240 V 350-415 V 500 V	AC 50/60 Hz 5 sec ON⁷⁾ 20-70 V 70-190 V 190-330 V 330-500 V 500 V	S3	3RV1902-1DB0 3RV1902-1DF0 3RV1902-1DP0 3RV1902-1DV0 3RV1902-1DS0	S00, S0, S2	1), 2) 3RV2902-1DB0 1), 2) 3RV2902-1DF0 1) 3RV2902-1DP0 3RV2902-1DV0 3RV2902-1DS0		

1) This product is also available with spring terminals. The order no. must be changed in the 8th position to a "2": e.g. 3RV1901-2E or 3RV2901-2E

2) This product is also available with ring lug terminals. The order no. must be changed in the 8th position to a "4": e.g. 3RV2901-4E

3) Each motor starter protector can be fitted with one transverse and one lateral auxiliary switch. The lateral auxiliary switch 2 NO + 2 NC is used without transverse auxiliary switch.

4) One signaling switch can be mounted at the left of the motor starter protector. This accessory cannot be used on the 3RV27 and 3RV28 circuit breakers.

5) One auxiliary release can be mounted at the right of each MSP, motor starter protector.

6) The response voltage at the lower limit of the voltage range at 0.85 (T_u=60°C) is valid for 100% (infinite)

7) The response voltage at the lower limit of the voltage range at 0.9 (T_u=60°C) applies for a duty cycle of 5 seconds at AC 50/60 Hz and DC.

3RV Motor Starter Protectors





Accessories

• Revised •
04/2015



Accessories for Busbar

Selection and ordering data

Modular spacing	Number of motor starter protectors that can be connected			Rated current I_n at 690 V	For motor starter protectors Size	Order No.	Order quantity	Weight approx.
	Without lateral accessories	Incl. lateral auxiliary switch	With auxiliary trip unit					
mm				A				kg
Three-phase busbar systems for Classic and Innovations								
 3RV19 15-1AB	45	2	--	63	S00, S0 ¹⁾²⁾	3RV19 15-1AB	1 unit	0.044
		3	--		S00, S0 ¹⁾²⁾	3RV19 15-1BB	1 unit	0.071
		4	--		S00, S0 ¹⁾²⁾	3RV19 15-1CB	1 unit	0.099
		5	--		S00, S0 ¹⁾²⁾	3RV19 15-1DB	1 unit	0.124
 3RV19 15-1BB	55	--	2	63	S00, S0 ¹⁾²⁾	3RV19 15-2AB	1 unit	0.048
			3		S00, S0 ¹⁾²⁾	3RV19 15-2BB	1 unit	0.079
			4		S00, S0 ¹⁾²⁾	3RV19 15-2CB	1 unit	0.111
			5		S00, S0 ¹⁾²⁾	3RV19 15-2DB	1 unit	0.140
 3RV19 15-1CB	63	--	--	63	S00, S0 ¹⁾²⁾	3RV19 15-3AB	1 unit	0.052
			2		S00, S0 ¹⁾²⁾	3RV19 15-3CB	1 unit	0.120
	55	2	--	108	S2 ³⁾	3RV19 35-1A	1 unit	0.150
		3	--		S2 ³⁾	3RV19 35-1B	1 unit	0.214
 3RV19 15-1DB		4	--		S2 ³⁾	3RV19 35-1C	1 unit	0.295
	75	--	2	108	S2	3RV19 35-3A	1 unit	0.161
			3		S2	3RV19 35-3B	1 unit	0.262
			4		S2	3RV19 35-3C	1 unit	0.369


1) Not suitable for 3RV11 motor starter protectors with overload relay function. The 3RV1915-5DB connecting piece is available for connecting motor starter protectors from size S0 to size S00.

2) Not suitable for 3RV UL 489 circuit breakers.




3) Auxiliary trip units and lateral auxiliary switches cannot be used in combination.

Version	Modular spacing	For motor starter protectors Size	Order No.	Order quantity	Weight approx.
	mm				kg


Connecting pieces for three-phase busbars

 3RV19 15-5DB	For connecting three-phase busbars for motor starter protectors of size S0 (left) to size S00 (right)	45	S00, S0	3RV19 15-5DB	1 unit	0.042
	Conductor cross-section, AWG cables, solid or stranded			3RV1 Classic¹⁾	3RV2 Innovations²⁾	
	For 3RV1 MSP	For 3RV2 MSP	Tightening torque			
	AWG	AWG	Nm			
				Order No.	Order No.	

Three-phase feeder terminals

 3RV29 25-5AB	Connection from top				—	3RV2925-5AB 3RV2925-5AB
	—	10...4	3...4	S00		
	—	10...4	3...4	S0	—	
 3RV2915-5B	Connection from below ³⁾				—	3RV2915-5B
	—	10...4	Input: 4, Output: 2 ... 2.5	S00, S0		
 3RV2935-5A	Connection from top				3RV1935-5A	3RV2935-5A
	14...0	--	4-6	S2		

Three-phase feeder terminals for constructing "Type E Starters"

 3RV2935-5E	Connection from top			—	3RV2925-5EB 3RV2925-5EB 3RV2935-5E
	—	10...4	3-4 S00		
	—	10...4	3-4 S0	—	
	8...0	10...2/0	4.5-6 S2	—	

1) Do not mix 3RV1 Classic Accessories with 3RV2 Innovations MSP's

2) Do not mix 3RV2 Innovations Accessories with 3RV1 Classic MSP's

3) This terminal is connected in place of a switch, please take the space requirement into account.

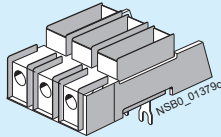


Overview

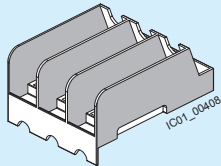
Accessories for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1

The 3RV20 motor starter protectors with screw terminals are approved according to UL 508/UL 60947-4-1 as "Self-Protected Combination Motor Controllers (Type E)".

This requires increased clearance and creepage distances (1 inch and 2 inches respectively) at the input side of the device, which are achieved by mounting a terminal block or a phase barrier.



SIRIUS 3RV2928-1H terminal block



SIRIUS 3RV2938-1K phase barrier

Motor starter protectors/circuit breakers	Size	Essential accessories for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1
3RV201., 3RV202.	S00/S0	3RV2928-1H terminal block or 3RV2928-1K phase barrier
3RV2031-4B1., 3RV2031-4D.1., 3RV2031-4E1., 3RV2031-4P.1., 3RV2031-4S.1., 3RV2031-4T.1., 3RV2031-4U.1., 3RV2031-4V.1.	S2	--
3RV2031-4J.1., 3RV2031-4K.1., 3RV2031-4R.1., 3RV2031-4W.1., 3RV2031-4X.1., 3RV2032	S2	3RV2938-1K phase barrier

-- No accessories needed

Special threephase infeed terminals are required for constructing "Type E Starters" with an insulated threephase busbar system (see page 1/8).

The 3RV20 infeed system also enables the assembly of "Type E Starters", see page 1/14 onwards.

Note:

According to CSA, these terminal blocks and the phase barriers can be omitted when the device is used as a "Self-Protected Combination Motor Controller (Type E)".

Link modules

Feeders can be easily assembled from single devices with the help of the link modules. The following table shows the different combination options for devices with screw or spring-type terminals.

Combination devices	3RV2 motor starter protectors/circuit breakers Size	3RT2 contactors; 3RW30, 3RW40 soft starters; 3RF34 solid-state contactors Size	Link modules	
			Screw terminals	Spring-type terminals
Link modules for connecting switching devices to 3RV2 motor starter protectors/circuit breakers ¹⁾				
3RT2 contactors with AC or DC coil	S00	S00	3RA1921-1DA00	3RA2911-2AA00
	S0	S00		--
	S2	S2	3RA2931-1AA00	--
3RT2 contactors with AC coil	S0	S0	3RA2921-1AA00	3RA2921-2AA00
	S00	S0		--
3RT2 contactors with DC coil	S0	S0	3RA2921-1BA00	3RA2921-2AA00
	S00	S0		--
3RW30 soft starters	S00	S00	3RA2921-1BA00	3RA2911-2GA00
	S0	S00		--
3RW30/3RW40 soft starters	S0	S0	3RA2921-1BA00	3RA2921-2GA00
	S00	S0		--
	S2 ²⁾	S2 ²⁾	3RA2931-1AA00	--
3RF34 solid-state contactors	S00/S0	S00	3RA2921-1BA00	--
Hybrid link modules for connecting contactors with spring-type terminals to 3RV2 motor starter protectors/circuit breakers with screw terminals ³⁾				
3RT2 contactors with AC or DC coil	S00	S00	3RA2911-2FA00	--
	S0	S0	3RA2921-2FA00	--

-- Version not possible

¹⁾ The link modules cannot be used for the 3RV2.21-4PA1., 3RV2.21-4FA1., 3RV2.31-4K.1., 3RV2.31-4R.1., 3RV2.32-4K.1., 3RV2.32-4R.1., 3RV27 and 3RV28 motor starter protectors/circuit breakers.

²⁾ To assemble the feeder between a motor starter protector and a soft starter in size S2, the 3RA2932-1AC00 standard mounting rail adapter must be used.

³⁾ The motor starter protector to contactor hybrid link modules cannot be used for the 3RV2.21-4PA1., 3RV2.21-4FA1., 3RV27 and 3RV28 motor starter protectors/circuit breakers. They are only suitable for constructing direct-on-line starters.

Note:

- Link modules can be used in
 - Sizes S00 and S0: up to max. 32 A
 - Size S2: up to max. 65 A
- Hybrid link modules can be used in
 - Sizes S00 and S0: up to max. 32 A

3RV Motor Starter Protectors


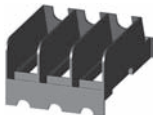

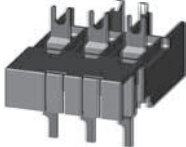
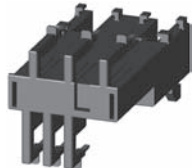
Accessories

• Revised •
04/20/15



Mounting accessories

Selection and ordering data

Version	For motor starter protector size	Classic 3RV1/3RT1 Order No.	Innovations 3RV2/3RT2 Order No.	Order Quantity
Terminal blocks and phase barriers for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508 / UL 60947-4-1				
<p>Note: UL 508 / UL 60947-4-1 demands 1-inch clearance and 2-inch creepage distance at line side for "Combination Motor Controller Type E". The following terminal blocks or phase barriers must be used on 3RV motor starter protectors. The terminal blocks or phase barriers cannot be used in combination with the 3RV19 .5 three-phase busbars. For construction with three-phase busbars, see "Accessories for busbar"</p>				
 3RV29 28-1H	Terminal blocks type E			
	For extended clearance and creepage distances (1 and 2 inch)	S00, S0 S0 S2 S3	— — — 3RT19 46-4GA07	3RV29 28-1H — 3RV29 35-5E —
				1 unit 1 unit 1 unit 1 unit
 3RV29 28-1K	Phase barriers			
	For extended clearance and creepage distances (1 and 2 inch)	S00, S0 S2	— —	3RV29 28-1K 3RV29 38-1K
				1 unit 1 unit
 3RT1946-4GA07				
Link modules for motor starter protector to contactor ¹⁾				
<p>For mechanical and electrical connection between motor starter protector and contactor with screw terminals.</p>				
 3RA29 21-1AA00	Single-unit packaging		Screw Terminals	
	AC/DC	S00	S00/S0	— — 3RA19 31-1AA00 3RA19 41-1AA00 — 3RA19 31-1BA00 3RA19 41-1BA00
	AC	S0	S00/S0	3RA29 21-1DA00 3RA29 21-1AA00 3RA29 31-1AA00 — 3RA29 21-1BA00 3RA29 31-1AA00 —
	AC	S2	S2	— — — — — — —
	AC	S3	S3	— — — — — — —
	DC	S0	S00/S0	— — — — — — —
	DC	S2	S2	— — — — — — —
	DC	S3	S3	— — — — — — —
				1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
 3RA29 11-2AA00	Multi-unit packaging		Spring-type Terminals	
	AC/DC	S00	S00/S0	— — — — — — —
	AC	S0	S00/S0	3RA19 21-1D 3RA29 21-1A 3RA29 21-1B 3RA29 31-1A
	DC	S0	S00/S0	— — — — — — —
	AC/DC	S2	S2	— — — — — — —
				10 units 10 units 10 units 5 units
<p>For mechanical and electrical connection between motor starter protector and contactor with spring-type terminals.</p>				
	Single-unit packaging		Spring-type Terminals	
	AC/DC	S00	S00	— — — — — — —
	AC ²⁾	S0	S0	3RA29 11-2AA00 3RA29 21-2AA00 3RA29 21-2AA00
	DC	S0	S0	— — — — — — —
				1 unit 1 unit 1 unit
<p>Spacers For compensating height on AC contactors</p>				
	Single-unit packaging	S0	S0	— —
	Multi-unit packaging	S0	S0	3RA29 11-1CA00 3RA29 11-1C
				1 unit 5 units

1) The link modules for motor starter protector to contactor cannot be used for the 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors

2) A spacer for height compensation on AC contactors size S0 is optionally available

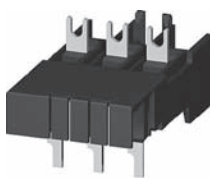

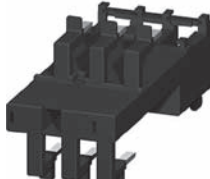

Note
Size S0 link modules can be used up to max. 32 A.
Size S2 link modules can be used up to 65A max.



Selection and ordering data

Size	Order No.	PU (UNIT, SET, M)	PS*	Weight approx. kg
3RW30, 3RW40 soft starters; 3RF34 solid-state contactors	3RV2 motor starter protectors			

Link modules for motor starter protector to soft starter^{1) 3)} and motor starter protector to solid-state contactor

 3RA29 21-1BA00	Connection between motor starter protector and soft starter / solid-state contactor with screw terminals		Screw terminals 				
	Single-unit packaging						
	S00	S00/S0	3RA29 21-1BA00	1	1 unit	0.068	
	S0	S00/S0	3RA29 21-1BA00	1	1 unit	0.068	
 3RA29 21-2GA00	Connection between motor starter protector and soft starter with spring-type terminals		Spring-type terminals 				
	Single-unit packaging						
	S00	S00/S0	3RA29 21-1B	1	10 units	0.068	
	S0	S00/S0	3RA29 21-1B	1	10 units	0.068	
	Multi-unit packaging						
	S2 ³⁾	S2	3RA29 31-1AA00	1	1 unit	0.104	
	S00	S00/S0	3RA29 31-1A	1	5 units	0.104	
	S0	S00/S0	3RA29 31-1A	1	5 units	0.104	
	Multi-unit packaging						
	S00	S00	3RA29 11-2GA00	1	1 unit	0.038	
	S0	S0	3RA29 21-2GA00	1	1 unit	0.072	
	S00	S00	3RA29 11-2G	1	10 units	0.380	
	S0	S0	3RA29 21-2G	1	10 units	0.720	

¹⁾ The link modules for motor starter protector to soft starter and for motor starter protector to solid-state contactor cannot be used for the 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors.

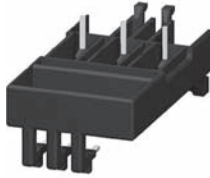
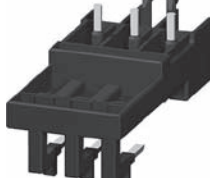
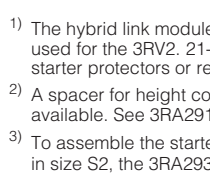
Note:

S0 link modules can be used up to max. 32 A.

S2 link modules can be used up to max. 65 A.

Actuating voltage of contactor	Size	Order No.	PU (UNIT, SET, M)	PS*	Weight approx. kg
	3RT2 contactors	3RV2 motor starter protectors			

Hybrid link modules for motor starter protector to contactor¹⁾

 3RA29 11-2FA00	For mechanical and electrical connection between motor starter protector with screw terminals and contactor with spring-type terminals						
	Single-unit packaging						
	AC/DC	S00	3RA29 11-2FA00	1	1 unit	0.029	
	AC ²⁾ /DC	S0	3RA29 21-2FA00	1	1 unit	0.056	
 3RA29 21-2FA00	Multi-unit packaging						
	AC/DC	S00	3RA29 11-2F	1	10 units	0.290	
	AC ²⁾ /DC	S0	3RA29 21-2F	1	10 units	0.560	
	Spacers²⁾ for compensating the height on AC contactors						
 3RA29 21-1CA00	Single-unit packaging						
	S0	S0	3RA29 11-1CA00	1	1 unit	0.001	
	Multi-unit packaging						
	S0	S0	3RA29 11-1C	1	5 units	0.001	

¹⁾ The hybrid link modules for motor starter protector to contactor cannot be used for the 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors or reversing starters.

²⁾ A spacer for height compensation on AC contactors size S0 is optionally available. See 3RA2911-1CA00

³⁾ To assemble the starter between a motor starter protector and a soft starter in size S2, the 3RA2932-1AC00 standard mounting rail adapter must be used.

Note:

Hybrid link modules can be used up to max. 32 A.

3RV Motor Starter Protectors

Accessories

• Revised •
10/25/15



Mounting accessories

Selection and ordering data

		Type	Design	For SIRIUS MSP size	Order No.	Order Quantity	Weight approx. (kg)
Isolator module ¹⁾							
	3RV2938-1A without padlock	Visible isolating distance for isolating individual motor starter protectors from the network, lockable in isolating position.	S00, S0	3RV29 28-1A	1 unit	0.132	
	3RV29 28-1A without padlock		S2 ¹⁾	3RV29 38-1A	1 unit	0.368	
Auxiliary terminal, 3 pole							
	3RT19 46-4F	For connection of auxiliary and control cables to the main conductor connections	S3	3RT19 46-4F	1 unit	0.10	
Covers							
	3RV1 (size S3) with 3RT19 46-4EA1	Terminal cover for box terminals	Additional touch guard to be fitted at the box terminals (2 units can be mounted per MSP)	S2	3RT29 36-4EA2	1 unit	0.014
				S3	3RT19 46-4EA2	1 unit	0.019
	3RV29 28-4AA00	Terminal cover for cable lug and bar connection	For maintaining the required voltage clearance and as protection against the equipment being touched if distant box terminals are used (2 units can be mounted per MSP)	S3	3RT19 46-4EA1	1 unit	0.03
	3RV29 08-4AA10	Terminal cover for devices with ring lug terminal connection	• Main current level • For transverse auxiliary switches	S00, S0 ²⁾	3RV29 28-4AA00	1 unit	0.01
				S00, S0 ²⁾	3RV29 08-4AA10	1 unit	0.01
	3RV29 08-0P	Scale cover	For covering the current setting scale. Packing unit: Bag with 10 scale covers.	S00, S0, S2 ³⁾ S3	3RV29 08-0P 3RV19 08-0P	10 units 10 units	
Fixing Material							
	3RB1900-0B	Push-in lugs For screwing the motor starter protector onto mounting plates.	Two units are required for each motor starter protector.	S00	3RB19 00-0B	10 units	0.10
Tools for opening spring-type terminals by hand							
	3RA29 08-1A	Screwdriver For all SIRIUS devices with spring terminals	Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black partially insulated	S00, S0, S2	3RA29 08-1A	1 unit	0.045

1) The isolator module for size S2 can be used only with 3RV2 motor starter protectors/circuit breakers up to max. 65 A. Similarly, it cannot be used with the transverse auxiliary switch or three-phase busbars.

2) Compatible with 3RV20 motor starter protectors.

3) Compatible with 3RV20, 3RV21, and 3RV24 motor starter protectors.

3RV29 infeed system

Overview

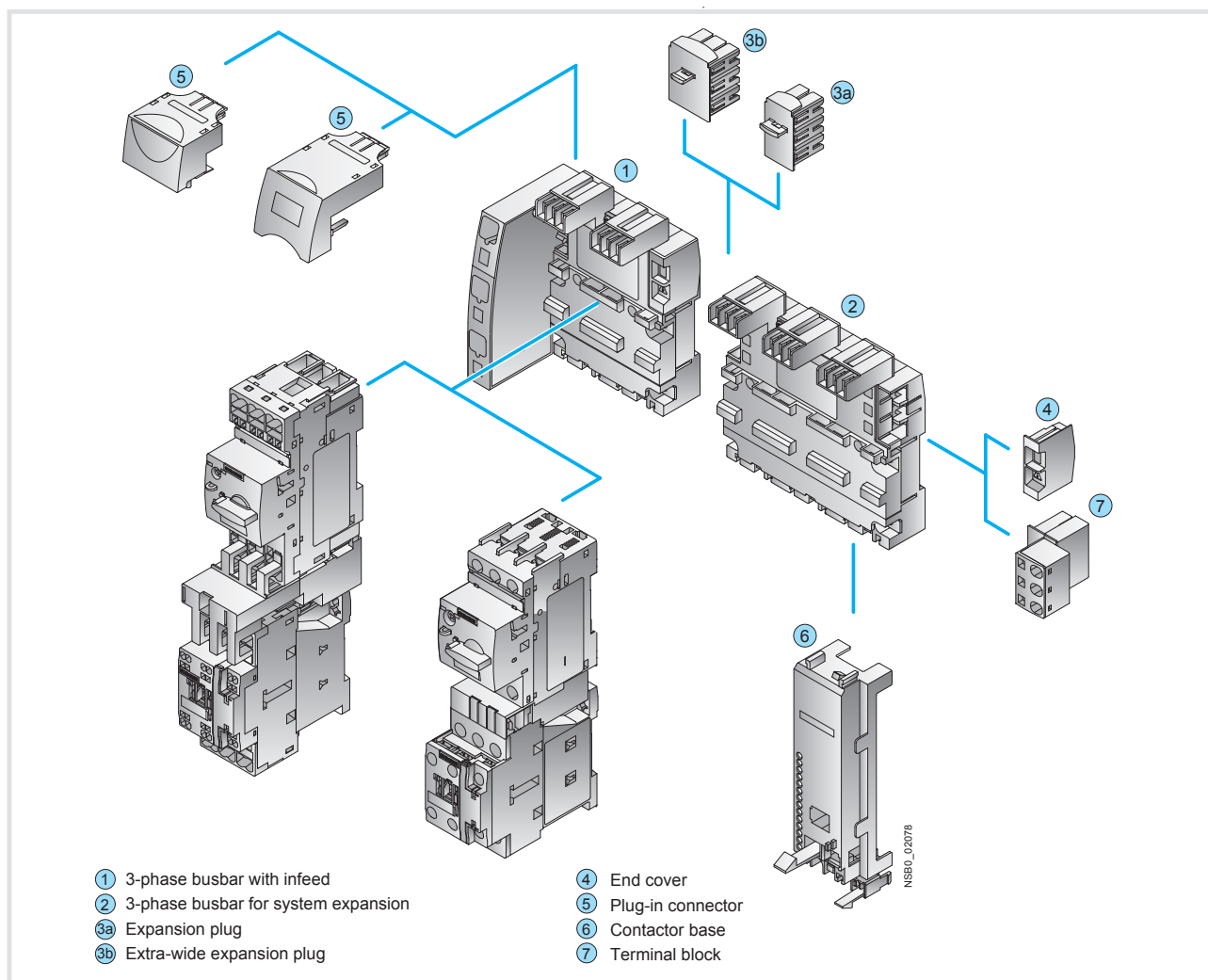
The 3RV29 infeed system is a convenient means of energy supply and distribution for a group of several motor starter protectors or complete motor starters with a screw or spring-type connection in sizes S00 and S0 (exception: this system cannot be used for the 3RV21, 3RV27 and 3RV28 motor starter protectors/circuit breakers).

The 3RV29 infeed system is approved in accordance with IEC to 500V. It is also UL approved and authorized for "Self-Protected Combination Motor Controller" (Type E starter) as well as for Type F starter (Type E starter + contactor). The system is based on a basic module complete with a lateral incoming unit (three-phase busbar with infeed). This infeed with spring-type terminals is mounted on the right or left depending on the version and can be supplied with a maximum conductor cross-section of 4 AWG (with end sleeve). A basic module has two sockets onto each of which a motor starter protector can be snapped.

Expansion modules are available for extending the system (three-phase busbars for system expansion). The individual modules are connected through an expansion plug.

The electrical connection between the three-phase busbars and the motor starter protectors is implemented through plug-in connectors. The complete system can be mounted on a TH 35 standard mounting rail to EN 60715 and can be expanded as required up to a maximum current carrying capacity of 63 A.

The system is mounted extremely quickly and easily thanks to the simple plug-in technique. Thanks to the lateral infeed, the system also saves space in the control cabinet. The additional overall height required for the infeed unit is only 30 mm. The alternative infeed possibilities on each side offer a high degree of flexibility for configuring the control cabinet: Infeed on left-hand or right-hand side as well as infeed on one side and out-feed on the other side to supply further loads are all possible. A terminal block with spring-type connections in combination with a standard mounting rail enables the integration of not only SIRIUS motor starter protectors but also single-phase, 2-phase and 3-phase components such as 5SY miniature circuit breakers or SIRIUS relay components.



3RV29 infeed system



① Three-phase busbars with infeed

A three-phase busbar with infeed unit is required for connecting the energy supply. This module comprises one infeed module and 2 sockets which each accept one motor starter protector. A choice of two versions with infeed on the left or right is available. The infeed is connected using spring-type terminals. The spring-type terminals permit conductor cross-sections of up to 25 mm² with end sleeves. An end cover is supplied with each module.

② Three-phase busbars for system expansion

The three-phase busbars for system expansion allow the system to be expanded. There is a choice of modules with 2 or 3 sockets. The system can be expanded as required up to a maximum current carrying capacity of 63 A. An expansion plug is supplied with each module.

③a Expansion plug

The expansion plug is used for electrical connection of adjacent three-phase busbars. The current carrying capacity of this plug equals 63 A. One expansion plug is supplied with each three-phase busbar for system expansion. Additional expansion plugs are therefore only required as spare parts.

③b Extra-wide expansion plug

The wide expansion plug makes the electrical connection between two three-phase busbars, thus performing the same function as the 3RV29 17-5BA00 expansion plug; the electrical characteristics (e.g. a current carrying capacity of 63 A) are identical.

The 3RV29 17-5E expansion plug is 10 mm wider than the 3RV29 17-5BA00 expansion plug, hence in the plugged state there is a distance of 10 mm between the connected three-phase busbars. This distance can be used to lay the auxiliary current and control current wiring ("wiring duct"). The motor starter protector and contactor can be wired from underneath, which means that the complete cable duct above the system can be omitted.

④ End cover

The end cover is used to cover the three-phase busbar at the open end of the system. This cover is therefore only required once for each system. An end cover is supplied with each three-phase busbar system with infeed. Further end covers are therefore only required as spare parts.

⑤ Plug-in connector

The plug-in connector is used for the electrical connection between the three-phase busbar and the 3RV2 motor starter protector. These plug-in connectors are available in versions for screw or spring-type terminals.

⑥ Contactor base

Motor starters can be assembled in the system using the contactor base. The contactor bases are suitable for contactors sizes S00 and S0 with spring-type and screw terminals and are simply snapped onto the three-phase busbars. Direct-on-line starters and reversing starters are possible. One contactor base is required for direct-on-line starters and two are required for reversing starters.

To assemble motor starters for reversing starters, the contactor bases can be arranged alongside each other (90 mm overall width). In this case the mechanical interlocking of the contactors is possible. The contactor bases are also suitable for soft starters size S00 and S0 with screw connection.

The infeed system is designed for mounting on a 35 mm standard mounting rail with 7.5 mm overall depth. This standard mounting rail gives the contactor base a stable mounting surface to sit on. If standard mounting rails with a depth of 15 mm are used, the spacer connected to the bottom of the contactor base must be knocked out and plugged into the mating piece that is also on the underside. Then the contactor base also has a stable mounting surface. When standard mounting rails with a depth of 7.5 mm are used, the spacer has no function and can be removed.

The link modules are used for direct start motor starters, in which case the use of a contactor base is not absolutely necessary. Motor starter protector and contactor assemblies can then be directly snapped onto the sockets of the three-phase busbars. For starters of size S00 and S0, the corresponding 3RA19 21-1..., 3RA29 11-2..., 3RA29 21-1... or 3RA29 21-2... link modules should generally be used.

⑦ Terminal block

The 3RV29 17-5D terminal block enables the integration of not only SIRIUS motor starter protectors but also single-phase, 2-phase and 3-phase components. Using the terminal block the 3 phases can be fed out of the system; which means that single-phase loads can also be integrated in the system. The terminal block is plugged into the slot of the expansion plug and thus enables outfeeding from the middle or end of the infeed system. The terminal block can be rotated through 180° and be locked to the support modules of the infeed system. The 3RV19 17-7B 45 mm standard mounting rail for screwing onto the support plate is available in addition in order to be able to plug the single-phase, 2-phase and 3-phase components onto the infeed system.

3RV Motor Starter Protectors

Accessories

• Revised •
10/25/15

SIRIUS

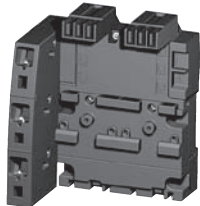


3RV29 infeed system

Selection and ordering data

Type	Version	For 3RV20, 3RV23, 3RV24 motor starter protectors	Order No.	Standard Pack Quantity	Weight approx.
		Size			kg

Three-phase busbars with infeed



3RV29 17-1A

3-phase busbars with infeed
incl. end cover
3RV29 17-6A

For 2 motor starter protectors with screw connection or spring-type terminals

- With infeed on the S00, S0 left
- With infeed on the S00, S0 right

3RV29 17-1A

1 unit

0.369

3RV29 17-1E

1 unit

0.369

Three-phase busbars for system expansion



3RV29 17-4A

Three-phase busbars
incl. 3RV29 17-5BA00 expansion plug

For motor starter protectors with screw connection or spring-type terminals

- For 2 motor starter S00, S0 protectors
- For 3 motor starter S00, S0 protectors

3RV29 17-4A

1 unit

0.229

3RV29 17-4B

1 unit

0.328

Plug-in connectors



3RV29 17-5AA00

Plug-in connectors
to make contact with the motor starter protectors

- For spring-type terminals
 - Single-unit packaging S00¹⁾ S0²⁾
 - Multi-unit packaging S00¹⁾ S0²⁾

Spring-type terminals



3RV29 17-5AA00

1 unit

0.046

3RV29 27-5AA00

1 unit

0.059

3RV29 17-5A

10 units

0.046

3RV29 27-5A

10 units

0.059



3RV29 17-5CA00

- For screw terminals
 - Single-unit packaging S00¹⁾ S0²⁾
 - Multi-unit packaging S00¹⁾ S0²⁾

Screw terminals



3RV29 17-5CA00

1 unit

0.029

3RV19 27-5AA00

1 unit

0.040

3RV29 17-5C

10 units

0.029

3RV19 27-5A

10 units

0.036

Type	Version	For contactors	Order No.	Standard Pack Quantity	Weight approx.
		Size			kg

Contactor bases



3RV29 27-7AA00

Contactor bases
for mounting direct-on-line or reversing starters

- Single-unit packaging S00
- S00, S0

3RV29 17-7AA00

1 unit

0.042

3RV29 27-7AA00






1 unit

0.050

¹⁾ $I > 14$ A, note derating; see the system manual "SIRIUS Innovations", Chapter "Motor Starter Protectors".

²⁾ $I > 16$ A, note derating; see the system manual "SIRIUS Innovations", Chapter "Motor Starter Protectors".



Type	Version	Order No.	Standard Pack Quantity	Weight approx. kg
Terminal blocks				
 3RV29 17-5D	Terminal blocks For integration of single-phase, two-phase and three-phase components	Single-unit packaging	3RV29 17-5D	1 unit 0.049
45 mm standard mounting rails				
 3RV19 17-7B	45 mm standard mounting rails for mounting onto bus bar adapters	Single-unit packaging	3RV19 17-7B	1 unit 0.261
Extra-wide expansion plugs				
 3RV29 17-5E	Extra-wide expansion plugs as accessory	Single-unit packaging	3RV29 17-5E	1 unit 0.037
Expansion plugs				
 3RV29 17-5BA00	Expansion plugs¹⁾ as spare part	Single-unit packaging	3RV29 17-5BA00	1 unit 0.026
End covers				
 3RV29 17-6A	End covers²⁾ as spare part	Multi-unit packaging	3RV29 17-6A	10 units 0.005

¹⁾ The expansion plug is included in the scope of supply of the 3RV29 17-4 three-phase busbars for system expansion.

²⁾ The end cover is included in the scope of supply of the 3RV29 17-1 three-phase busbars with infeed system.

3RV Motor Starter Protectors

General Data

**3RV up to 100 A
(Domestic applications)**

• Revised •
10/25/15

SIRIUS



Permissible rated data of devices approved for North America (UL/CSA)

Motor starter protectors of the 3RV2 series are approved for UL/CSA, and according to UL508/UL 60947-4-1 and CSA C22.2 No. 14/CSA C22.2 No. 60947-4-1 they can be used on their own or as load feeders in combination with a contactor.

These motor starter protectors can be used as "Manual Motor Controllers" for "Group Installations", as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" and as "Self-Protected Combination Motor Controllers" (Type E).

3RV motor starter protectors as "Manual Motor Controllers"

If used as a "Manual Motor Controller", the motor starter protector is always operated in combination with an upstream short-circuit protection device. Approved fuses or a circuit breaker according to UL 489/CSA C22.2 No. 5 can be used. These devices must be dimensioned according to the National Electrical Code (UL) or Canadian Electrical Code (CSA).

Approval of the 3RV as a Manual Motor Controller can be found under the following file numbers:

- UL File No. 47705, CCN: NLRV,
- CSA Master Contract 165071, Product Class: 3211 05.

Motor starter protectors		hp rating ¹⁾ for FLA ²⁾ max.		Rated current I _n	240 V AC UL/CSA I _{bc} ³⁾	480 V AC UL/CSA I _{bc} ³⁾	600 V AC UL/CSA I _{bc} ³⁾
Type	V	1-phase	3-phase	A	kA	kA	kA
Size S00							
3RV2011, 3RV2111, 3RV2311, 3RV2411				0.16 ... 2	65	65	30
FLA ²⁾ max.	115	1	2	2.5	65	65	30
16 A, 480 V	200	2	3	3.2	65	65	30
12.5 A, 600 V	230	2	5	4	65	65	30
	460	--	10	5	65	65	30
	575/600	--	10	6.3	65	65	30
				8	65	65	30
				10	65	65	30
				12.5	65	65	30
				16	65	65	—
Size S0							
3RV2021, 3RV2121, 3RV2321, 3RV2421				0.16 ... 12.5	65	65	30
FLA ²⁾ max.	115	3	5	16 ... 25	65	65	--/(30) ⁴⁾
40 A, 480 V	200	5	10	28, 32	65	50	--
	230	7 1/2	10	36, 40	65	12	--
	460	--	30				
	575/600	--	--				
Size S2					3RV2031	3RV2032	3RV2031 3RV2032
3RV2031, 3RV2131, 3RV2331, 3RV2032, 3RV2332				14	65	100	25 25
				17	65	100	25 25
				20	65	100	25 25
FLA ²⁾ MAX. 65A	115/120	5	10	25	65	100	25 25
600V	200/208	10	20	32	65	100	25 25
NEMA size 2	230/240	15	25	36	65	100	25 25
	460/480	—	50	40	65	100	22 22
	575/600	—	60	45	65	100	22 22
				52	65	100	22 22
				59	65 ^{a)}	100 ^{a)}	20 ^{a)} 25 ^{a)}
a) with max 225A Class J fuse				65	65 ^{b)}	100 ^{b)}	20 ^{b)} 25 ^{b)}
b) with max 250A Class J fuse							
Size S3							
3RV10 41/3RV10 42, 3RV11 42, 3RV13 41/3RV13 42				16	65	65	30
FLA ²⁾ max. 99 A,	115	7 1/2	--	20	65	65	30
600 V	200	20	30	25	65	65	30
NEMA size 3	230	20	40	32	65	65	30
	460	--	75	40	65	65	30
	575/600	--	100	50	65	65	30
				63	65	65	30
				75	65	65	30
				90	65	65	10
				100	65	65	10

¹⁾ hp rating = Power rating in horse power (maximum motor rating).

²⁾ FLA = Full Load Amps/Motor full load current.

³⁾ Corresponds to "short-circuit breaking capacity" according to UL/CSA.

⁴⁾ The values in brackets only apply to 3RV2.23 motor starter protectors.



3RV motor starter protectors as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations"

The application as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" is only available from UL.

CSA does not recognize this approval! When the motor starter protector is used as a "Manual Motor Controller Suitable for Tap Conductor Protection in Group Installations", it must always be combined with upstream short-circuit protection. As short-circuit-protection device, approved fuses or a motor starter

protector according to UL 489 can be used.

These devices must be dimensioned according to the National Electrical Code.

The 3RV motor starter protectors are approved as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" under the following file number:

- UL File No. 47705, CCN: NLRV.

Motor starter protectors		hp rating ¹⁾ for FLA ²⁾ max.		Rated current I_n	240 V AC UL I_{bc} ³⁾	Up to 480Y/277V AC UL I_{bc} ³⁾	Up to 600Y/347V AC UL I_{bc} ³⁾
Type	V	1-phase	3-phase	A	kA	kA	kA
Size S00							
3RV20 11							
				0.16 ... 0.8	65	65	30
				1	65	65	30
				1.25	65	65	30
				2	65	65	30
				2.5	65	65	30
				3.2	65	65	30
				4	65	65	30
				5	65	65	30
				6.3	65	65	30
				8	65	65	30
				16	65	65	—
Size S0							
3RV20 21							
				0.63 ... 1.6	65	65	30
				2	65	65	30
				2.5	65	65	30
				3.2	65	65	30
				4	65	65	30
				5	65	65	30
				6.3	65	65	30
				8	65	65	30
				10	65	65	30
				12.5	65	65	30
				25	65	65	—
				32	50	50	—
Size S2							
					3RV2031	3RV2032	3RV2031
					3RV2032	3RV2031	3RV2032
3RV2031, 3RV2032, 3RV2431				14	65	100	65
				17	65	100	65
				20	65	100	65
				25	65	100	65
				32	65	100	65
				36	65	100	65
				40	65	100	65
				45	65	100	65
				52	65	100	65
				59	65	100	30
				65	65	100	30
Size S3							
3RV10 4.							
				16	65	65	30
				20	65	65	30
				25	65	65	30
				32	65	65	30
				40	65	65	30
				50	65	65	30
				63	65	65	30
				75	65	65	30
				90	65	65	—
				100	65	65	—

¹⁾ hp rating = Power rating in horse power (maximum motor rating).

²⁾ FLA = Full Load Amps/Motor full load current.

³⁾ Complies with "short-circuit breaking capacity" according to UL.



3RV motor starter protectors as "Self-Protected Combination Motor Controllers (Type E)"

UL 508/UL 60947-4-1 approval demands 1-inch clearance and 2-inch creepage distance at line side for "Self-Protected Combination Motor Controller Type E".

Therefore, 3RV20 motor starter protectors of sizes S00 to S2 are approved according to UL 508/UL 60947-4-1 in combination with the terminal blocks listed below.

CSA does not require these extended clearances and creepage distances. According to CSA, these terminal blocks can be omitted

when the device is used as a "Self-Protected Combination Motor Controller".

The 3RV20 motor starter protectors are approved as "Self-Protected Combination Motor Controllers" under the following file numbers:

- UL File No. E156943, CCN: NKJH
- CSA Master Contract 165071, Product Class: 3211 08

Motor starter protectors		hp rating ¹⁾ for FLA ²⁾ max.		Rated current I _n	Up to 240 V AC UL/CSA I _{bc} ³⁾	Up to 480 Y/277 V AC UL/CSA I _{bc} ³⁾	Up to 600 Y/347 V AC UL/CSA I _{bc} ³⁾
Type	V	1-phase	3-phase	A	kA	kA	kA
Size S00							
3RV2011 + 3RV29 28-1H⁴⁾ 5)				0.16 ... 12.5 16	65 65	65 65	30 —
FLA ²⁾ max. 16 A	115	1	2				
480 V	200	2	3				
NEMA size 0	230	2	5				
	230	—	10				
	575/600	—	10				
Size S0							
3RV2021 + 3RV29 28-1H⁴⁾ 5)				0.63 ... 1.6 2 2.5	65 65 65	65 65 65	30 30 30
FLA ²⁾ max.	115	2	5				
25 A, 480 V	200	3	7.5				
12.5 A, 600 V	230	3	10				
	460	—	20				
NEMA size 1	575/600	—	—				
				6.3 8 10	65 65 65	65 65 65	30 30 30
				12.5 16 20 22 25 32	65 65 65 65 65 50	65 65 65 65 65 50	30 — — — — —
Size S2							
3RV2031/3RV2032 + 3RV2938-1K⁴⁾				14 17 20 25	65 65 65 65	100 100 100 100	25 25 25 25
FLA ²⁾ MAX. 65A	115/120	5	10				
600V	200/208	10	20				
NEMA size 2	230/240	15	25				
	460/480	—	50				
	575/600	—	60				
				32 36 40 45 52 59 65	65 65 65 65 65 65 65	100 100 100 100 100 30 30	25 25 22 22 22 — —
Size S3							
3RV1041 + 3RT1946-4GA07⁴⁾				16 20 25	65 65 65	65 65 65	30 30 30
FLA ²⁾ max.	115	10	—				
100 A, 480 V	200	20	30				
75 A, 600 V	230	20	40				
	460	—	75				
NEMA size 3	575/600	—	75				
				32 40 50 63 75 90 100	65 65 65 65 65 65 65	65 65 65 65 65 65 65	30 30 30 30 — — —
Ratings of the auxiliary switches and alarm switches				Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC and signalling switch		Transverse auxiliary switch with 1 changeover contact	Transverse auxiliary switch with 1 NO + 1 NC, 2 NO
Max. rated voltage	• to NEMA ☉ • to NEMA ☿			AC V AC V	600 600		250 250
Uninterrupted current				A	10	5	2.5
Breaking capacity					A600 Q300	B600 R300	C300 R300

1) hp rating = Power rating in horse power (maximum motor rating).

2) FLA = Full Load Amps/Motor full load current.

3) Corresponds to "short-circuit breaking capacity" according to UL/CSA.

4) Not required for CSA.

5) Alternatively, the 3RV2928-1K phase barrier can also be used.



3RV17/27 and 3RV18/28 circuit breakers

These circuit breakers are approved according to UL 489 and CSA C22.2 No. 5-02 for 100 % rated current (100 % rated breaker). They can be used therefore as upstream short-circuit protective devices for "Manual Motor Controllers" and "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations".

The 3RV17/27 and 3RV18/28 circuit breakers are approved under the following file numbers:

- UL File No. E235044, CCN: DIVQ,
- CSA Master Contract 165071, Product Class: 1432 01.

Circuit breakers	Rated current I_n	240 V AC UL/CSA $I_{bc}^{1)}$ kA	480 Y/277 V AC UL/CSA $I_{bc}^{1)}$ kA	480 V AC UL/CSA $I_{bc}^{1)}$ kA	600 Y/347 V AC UL/CSA $I_{bc}^{1)}$ kA
Type	A				
Size S00/S0					
3RV27 11 / 3RV28 11 3RV27 21 / 3RV28 21	0.16 ... 1.25	65	65	65	10
	1.6	65	65	65	10
	2	65	65	65	10
	2.5	65	65	65	10
	3.2	65	65	65	10
	4	65	65	65	10
	5	65	65	65	10
	6.3	65	65	65	10
	8	65	65	65	10
	10	65	65	65	10
	12.5	65	65	65	10
	15	65	65	65	--
	20	50	50	50	--
	22	50	50	50	--
Size S3					
3RV17 42	10	65	65	65	20
	15	65	65	65	20
	20	65	65	65	20
	25	65	65	65	20
	30	65	65	65	20
	35	65	65	--	20
	40	65	65	--	20
	45	65	65	--	20
	50	65	65	--	20
	60	65	65	--	20
	70	65	65	--	10

1) Complies with "short-circuit breaking capacity" according to UL.



Technical specifications

Short-circuit breaking capacity I_{cu} , I_{cs} acc. to IEC 60947-2

This table shows the rated ultimate short-circuit breaking capacity I_{cu} and the rated service short-circuit breaking capacity I_{cs} of the 3RV2 motor starter protectors/circuit breakers with different inception voltages dependent of the rated current I_n of the motor starter protectors/circuit breakers.






Power can be supplied to the motor starter protectors/circuit breakers via the terminals at the top or at the bottom without restricting the rated data. If the short-circuit current at the place of installation exceeds the rated short-circuit breaking capacity of the motor starter protector/circuit breaker as specified in the

table, a back-up fuse is required. It is also possible to install an upstream motor starter protector/circuit breaker with a limiter function.

The maximum rated current for the back-up fuse is specified in the tables. The rated ultimate short-circuit breaking capacity then applies as specified on the fuse.

Fuseless construction

Motor starter protector contactor combinations for short-circuit currents up to 150 kA can be ordered in the form of fuseless load feeders according to Chapter 6.

Motor starter protectors/circuit breakers	Rated current <i>I</i> _n	Up to 240 V AC ¹⁾			Up to 400 V ¹⁾ /415 V AC ²⁾			Up to 440 V ¹⁾ /460 V AC ²⁾			Up to 500 V ¹⁾ /525 V AC ²⁾			Up to 690 V AC ¹⁾		
		<i>I</i> _{cu}	<i>I</i> _{cs}	Max. fuse (gL/gG) 	<i>I</i> _{cu}	<i>I</i> _{cs}	Max. fuse (gL/gG) ³⁾ 	<i>I</i> _{cu}	<i>I</i> _{cs}	Max. fuse (gL/gG) ³⁾ 	<i>I</i> _{cu}	<i>I</i> _{cs}	Max. fuse (gL/gG) ³⁾ 	<i>I</i> _{cu}	<i>I</i> _{cs}	Max. fuse (gL/gG) ³⁾ 
Type	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
Size S00																
3RV2.11	0.16 ... 1	100	100	°	100	100	°	100	100	°	100	100	°	100	100	°
	1.25; 1.6	100	100	°	100	100	°	100	100	°	100	100	°	100	100	°
	2; 2.5	100	100	°	100	100	°	100	100	°	100	100	°	10	10	25
	3.2; 4	100	100	°	100	100	°	50	10	°	100	100	°	10; 6	10; 4	32
	5; 6.3	100	100	°	100	100	°	50	10	°	100	100	°	6	4	32
	8	100	100	°	50	12.5	°	50	50	63	42	42	63	6	4	50
	10	100	100	°	50	12.5	°	50	50	80	42	42	63	6	4	50
12	100	100	°	50	12.5	°	50	50	80	42	42	80	4	4	63	
16	100	100	°	55	30	100	50	10	80	10	5	80	4	4	63	
Size S0																
3RV2.21	16	100	100	°	55	25	100	50	10	80	10	5	80	4	2	63
	20	100	100	°	55	25	125	50	10	80	10	5	80	4	2	63
	22	100	100	°	55	25	125	50	10	100	10	5	80	4	2	63
	25	100	100	°	55	25	125	50	10	100	10	5	80	4	2	63
	28	100	100	°	55	25	125	30	10	125	10	5	100	4	2	100
	32	100	100	°	55	25	125	30	10	125	10	5	100	4	2	100
	36	100	100	°	20	10	125	12	8	125	6	3	100	3	2	100
40	100	100	°	20	10	125	12	8	125	6	3	100	3	2	100	
Size S2																
3RV2.31	14; 17	100	100	°	65	30	100	50	25	100	12	6	63	5	3	63
	20	100	100	°	65	30	100	50	25	100	12	6	80	5	3	80
	25	100	100	°	65	30	100	50	15	100	12	6	80	5	3	80
	32; 36	100	100	°	65	30	125	50	15	125	10	5	100	4	2	100
	40; 45	100	100	°	65	30	160	50	15	125	10	5	100	4	2	100
	52	100	100	°	65	30	160	50	15	125	10	5	125	4	2	125
	59 ... 80	Values on request														
Size S2, with increased switching capacity																
3RV2.32	14; 17	100	100	°	100	50	°	65	30	100	18	10	63	8	5	63
	20; 25	100	100	°	100	50	°	65	30	100	18	10	80	8	5	80
	32 ... 45	100	100	°	100	50	°	65	30	125	15	8	100	6	4	100
	52	100	100	°	100	50	°	65	30	125	15	8	125	6	4	125
	59 ... 80	Values on request														
Size S3																
3RV1. 41	40	100	100	°	50	25	125	50	20	125	12	6	100	6	3	63
	50	100	100	°	50	25	125	50	20	125	12	6	100	6	3	80
	63	100	100	°	50	25	160	50	20	160	12	6	100	6	3	80
	75	100	100	°	50	25	160	50	20	160	8	4	125	5	3	100
	90; 100	100	100	°	50	25	160	50	20	160	8	4	125	5	3	125

Short-circuit resistant up to at least 50 kA

° No back-up fuse required, since short-circuit resistant up to 100 kA

¹⁾ 10 % overvoltage.

²⁾ 5 % overvoltage.

³⁾ Back-up fuse only required if the short-circuit current at the place of installation > I_{cu} .

⁴⁾ Alternatively, fuseless limiter combinations for 690 V AC can also be used.







**Short-circuit breaking capacity I_{cuIT} in the IT system
(IT network) according to IEC 60947-2**

3RV motor starter protectors are suitable for operation in IT systems. Values valid for triple-pole short-circuit are I_{cu} up to I_{cs} . In case of double ground fault on different phases at the input and output side of a motor starter protector, the special short-circuit breaking capacity I_{cuIT} applies. The specifications in the table below apply to 3RV motor starter protectors.

In the colored areas, I_{cuIT} is 100 kA, or in some ranges it is 50 kA. Therefore the motor starter protectors are short-circuit resistant in these ranges.

If the short-circuit current at the place of installation exceeds the rated short-circuit breaking capacity of the motor starter protector as specified in the table, a back-up fuse is required. The maximum rated current for the back-up fuse is specified in the tables. The rated short-circuit breaking capacity then applies as specified on the fuse.

Motor starter protectors	Rated current	Up to 240 V AC ¹⁾		Up to 400 V ¹⁾ /415 V AC ²⁾		Up to 500 V ¹⁾ /525 V AC ²⁾		Up to 690 V AC ^{1) 5)}	
	I_n	I_{cuIT}	Max. fuse (gL/gG) ³⁾	I_{cuIT}	Max. fuse (gL/gG) ³⁾⁴⁾	I_{cuIT}	Max. fuse (gL/gG) ³⁾	I_{cuIT}	Max. fuse (gL/gG) ³⁾
Type	A	kA	A	kA	A	kA	A	kA	A
									
Size S00									
3RV20, 3RV26 11-0BD10	0.16 ... 0.63	100	°	100	°	On request	On request	On request	On request
	0.8; 1	100	°	100	°				
	1.25; 1.6	100	°	100	°				
	2; 2.5	100	°	8	25				
	3.2; 4	100	°	8;4	32				
	5; 6.3	100	°	4	32:50				
	8; 10	100	°	4	50				
	12.5	100	°	4	63				
	16	55	80	4	63				
Size S0									
3RV2.21	16	55	80	4	63	2	50	1.5	40
	20	55	80	4	63	2	50	1.5	50
	22	55	80	4	63	2	50	1.5	50
	25	55	80	4	63	2	50	1.5	50
	28	55	80	2	63	2	63	1.5	63
	32	55	80	2	63	2	63	1.5	63
	36	20	80	2	63	2	63	1.5	63
	40	20	80	2	63	2	63	1.5	63
Size S2									
3RV2.31	14...25	100	°	8	100	6	80	4	63
	32...45	100	°	6	125	4	100	3	80
	52	100	°	4	160	3	125	2	100
	59 ... 80	Values on request							
Size S2, with increased switching capacity									
3RV2.32	14 ... 25	100	°	8	100	6	80	4	63
	32 ... 45	100	°	6	125	6	100	4	80
	52	100	°	6	160	6	125	4	100
	59 ... 80	Values on request							
Size S3									
3RV1. 41	40	50	125	10	63	5	50	5	50
	50	50	125	8	80	3	63	3	63
	63	50	160	6	80	3	63	3	63
	75	50	160	5	100	2	80	2	80
	90; 100	50	160	5	125	2	100	2	100

Short-circuit resistant up to at least 50 kA

° No back-up fuse required, since short-circuit resistant up to 100 kA

1) 10 % overvoltage.

2) 5 % overvoltage.

3) Back-up fuse only required, if short-circuit current at the place of installation > I_{cuIT} .

4) Alternatively, fuseless limiter combinations for 690 V AC can also be used.

5) Over-voltage category II applies for applications on IT systems > 600V

3RV Motor Starter Protectors

General Data

3RV
up to 100 A

• Revised •
10/25/15

SIRIUS



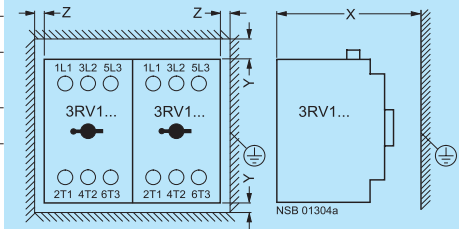
Technical data

Rules for mounting motor starter protectors/circuit breakers

When mounting MSP's, the following clearance must be maintained to grounded or live parts.

SIRIUS MSP			Clearance to grounded or live parts		
Type	size		Y mm	X mm	at the side Z mm
3RV2.1	S00	up to 690 V	30	70	9
3RV2. 2	S0 ²⁾	up to 500 V up to 690 V	30 50 ¹⁾	90 90	9 30
3RV2. 3	S2	up to 690 V	50	—	10
3RV1. 4	S3	up to 240 V	50	167	10
		up to 440 V	70	167	10
		up to 500 V	110	167	10
		up to 690 V	150	167	30
3RV17 42	S3	up to 240 V	90	167	10
		up to 400 V	90	167	10

Minimum clearance between MSP's and grounded or live parts



1) Up to and including the setting range of 32 A. For the 36/40 A setting range the clearance is 70 mm.

2) In conjunction with the type E terminal block 3RV2928-1H the applicable lateral clearance is 30 mm for all voltages.

Standard mounting for S0, S2 and S3

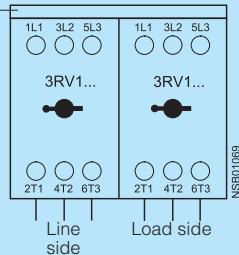
Wiring module


Size S0: 3RV19 15-1AB

Size S2: 3RV19 35-1A




Size S3: 3RA19 43-3D

(Caution: The wiring module demands 10 mm spacing between the MSPs)



General data							
Type				3RV2.1.	3RV2.2.	3RV2.3.	3RV27, 3RV28
Size				S00	S0	S2	S00, S0
Dimensions (W x H x D)				45 x 97 x 91	45 x 97 x 91	55 x 140 x 149	45 x 144 x 92
• Screw terminals				45 x 106 x 91	45 x 119 x 91	--	--
• Spring-type terminals							
Standards				Yes			
• IEC 60947-1, EN 60947-1 (VDE 0660 Part 100)				Yes			
• IEC 60947-2, EN 60947-2 (VDE 0660 Part 101)				Yes			
• IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)				Yes	Yes	Yes	--
• UL 508/UL 60947-4-1, CSA C22.2 No. 14/CSA C22.2 No. 60947-4-1				Yes	Yes	Yes	--
• UL 489, CSA C22.2 No. 5				--	--	--	Yes
Number of poles				3			
Max. rated current I_n max (= max. rated operational current I_o)		A		16	40	80	22
Permissible ambient temperature							
• Storage/transport		°C		-50 ... +80			
• Operation	I_n : 0.16 ... 32 A	°C		-20 ... +70 (current reduction above +60 °C)		--	
	I_n : 36 ... 40 A	°C		--	-20 ... +40 (the devices must not be mounted side-by-side and they must not be assembled with link modules with contactors. A lateral clearance of 9 mm is required.)	--	
	I_n : 14 ... 80 A	°C		--		-20 ... +70 (current reduction above +60 °C)	--
Permissible rated current at inside temperature of control cabinet							
• +60 °C		%		100			
• +70 °C		%		87			
Permissible rated current at ambient temperature of enclosure (applies for motor starter protector/circuit breaker inside enclosure ≤ 32 A)							
• +35 °C		%		100			
• +60 °C		%		87		On request	100
Rated operational voltage U_e							
• Acc. to IEC		V AC		690 (when a molded-plastic enclosure is used only 500 V)			
• Acc. to UL/CSA		V AC		600			
Rated frequency		Hz		50/60			
Rated insulation voltage U_i		V		690			
Rated impulse withstand voltage U_{imp}		kV		6			
Utilization category							
• IEC 60947-2 (motor starter protector/circuit breaker)				A			
• IEC 60947-4-1 (motor starter)				AC-3			
Trip class CLASS	Acc. to IEC 60947-4-1			10		10/20	--
DC short-circuit breaking capacity (time constant $t = 5$ ms)							
• 1 conducting path 150 V DC		kA		10		On request	10
• 2 conducting paths in series 300 V DC		kA		10			10
• 3 conducting paths in series 450 V DC		kA		10			10
Power loss P_r for each motor starter protector/circuit breaker	I_n : 0.16 ... 0.63 A	W		5		--	5
	I_n : 0.8 ... 6.3 A	W		6		--	6
Dependent on the rated current I_n	I_n : 8 ... 16 A	W		7		--	7
(upper setting range)	I_n : 16 A	W		--	7	10	7
	I_n : 17 ... 25 A	W		--	8	12	8
	I_n : 28 ... 32 A	W		--	11	14	--
	I_n : 36 ... 40 A	W		--	14	15	--
	I_n : 45 ... 52 A	W		--	--	17	--
	I_n : ... 80 A	W		--	--	On request	--
$R_{per\ conducting\ path} = \frac{P}{I^2 \times 3}$							
Shock resistance	Acc. to IEC 60068-2-27	g/ms		25/11 (square and sine pulse)			
Degree of protection	Acc. to IEC 60529			IP20			
Touch protection	Acc. to EN 50274			Finger-safe for vertical contact from the front			
Temperature compensation	Acc. to IEC 60947-4-1	°C		-20 ... +60			
Phase failure sensitivity	Acc. to IEC 60947-4-1			Yes (only for 3RV23 motor starter protectors)			No
Explosion protection – Safe operation of motors with "increased safety" type of protection				Yes (only for 3RV20 motor starter protectors)			
EC type test certificate number according to directive 94/9/EC (ATEX)				DMT 02 ATEX F 001  II (2) GD		On request	No






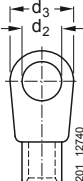
Conductor cross-sections of main circuit						
Type		3RV2.11	3RV2.21	3RV2.31-4B1., 3RV2.31-4D.1., 3RV2.31-4E.1., 3RV2.31-4P.1., 3RV2.31-4S.1., 3RV2.31-4T.1., 3RV2.31-4U.1., 3RV2.31-4V.1.	3RV2.31-4J.1., 3RV2.31-4K.1., 3RV2.31-4R.1., 3RV2.31-4W.1., 3RV2.31-4X.1., 3RV2431-4VA1., 3RV2.32	3RV27, 3RV28
Size		S00	S0	S2		S00, S0
Connection type		 Screw terminals				
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	M6, Pozidriv size 2		M4, Pozidriv size 2
Operating devices		mm	Ø 5 ... 6	Ø 5 ... 6		Ø 5 ... 6
Prescribed tightening torque		Nm	0.8 ... 1.2	2 ... 2.5	3.0 ... 4.5	2.5 ... 3
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected						
• Solid or stranded	mm ²	2 x (0.75 ... 2.5) ¹⁾ , 2 x 4	2 x (1 ... 2.5) ¹⁾ , 2 x (2.5 ... 10) ¹⁾	2 x (1 ... 25) ¹⁾ , 1 x (1 ... 35) ¹⁾	2 x (1 ... 35) ¹⁾ , 1 x (1 ... 50) ¹⁾	2 x (1 ... 10) ¹⁾ , max. 1 x 25
• Finely stranded with end sleeve (DIN 46228-1)	mm ²	2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾	2 x (1 ... 2.5) ¹⁾ , 2 x (2.5 ... 6) ¹⁾ , 1 x 10	2 x (1 ... 16) ¹⁾ , 1 x (1 ... 25) ¹⁾	2 x (1 ... 25) ¹⁾ , 1 x (1 ... 35) ¹⁾	1 x (1 ... 16), max. 6 + 16
• AWG cables, solid or stranded	AWG	2 x (20 ... 16) ¹⁾ , 2 x (18 ... 12) ¹⁾	2 x (16 ... 12) ¹⁾ , 2 x (14 ... 8) ¹⁾	2 x (18 ... 3) ¹⁾ , 1 x (18 ... 2) ¹⁾	2 x (18 ... 2) ¹⁾ , 1 x (18 ... 1) ¹⁾	2 x (14 ... 10)
Connection type		 Spring-type terminals				
Operating devices		mm	3.0 x 0.5 and 3.5 x 0.5			
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected						
• Solid or stranded	mm ²	2 x (0.5 ... 4)	2 x (1 ... 10)	--		
• Finely stranded without end sleeve	mm ²	2 x (0.5 ... 2.5)	2 x (1 ... 6)	--		
• Finely stranded with end sleeve (DIN 46228-11)	mm ²	2 x (0.5 ... 2.5)	2 x (1 ... 6)	--		
• AWG cables, solid or stranded	AWG	2 x (20 ... 12)	2 x (18 ... 8)	--		
Max. external diameter of the conductor insulation	mm	3.6	3.6	--		
Connection type		 Ring terminal lug connections				
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	--		
Operating devices		mm	Ø 5 ... 6	Ø 5 ... 6	--	
Prescribed tightening torque		Nm	0.8 ... 1.2	2 ... 2.5	--	
Usable ring terminal lugs		mm	d ₂ = min. 3.2, d ₃ = max. 7.5	d ₂ = min. 4.3, d ₃ = max. 12.2	--	
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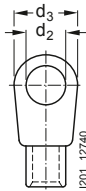
¹⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.



			3RV2.1. S00	3RV2.2. S0	3RV2.3. S2	3RV27, 3RV28 S00, S0
Front transverse auxiliary switches						
			Switching capacity for different voltages			
			1 CO		1 NO + 1 NC, 2 NO	
Rated operational current I_e						
• At AC-15, alternating voltage		A	4		2	
	- 24 V	A	3		0.5	
• At AC-12 = I_{th} , alternating voltage		A	10		2.5	
	- 24 V	A	10		2.5	
• At DC-13, direct voltage L/R 200 ms		A	1		1	
	- 24 V	A	--		0.3	
- 48 V		A	--		0.15	
	- 60 V	A	0.22		--	
- 110 V		A	0.1		--	
	- 220 V	A				
Minimum load capacity		V	17			
		mA	1			
Front transverse solid-state compatible auxiliary switches						
			Switching capacity for different voltages			
			1 CO			
Rated operational voltage U_e	Alternating voltage	V	125			
Rated operational current $I_e/AC-14$	at $U_e = 125$ V	A	0.1			
Rated operational voltage U_e	Direct voltage L/R 200 ms	V	60			
Rated operational current $I_e/DC-13$	at $U_e = 60$ V	A	0.3			
Minimum load capacity		V	5			
		mA	1			
Lateral auxiliary switches with signaling switch						
			Switching capacity for different voltages:			
			Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC			
			Signaling switch			
Rated operational current I_e						
• At AC-15, alternating voltage		A	6			
	- 24 V	A	4			
	- 230 V	A	3			
	- 400 V	A	1			
• At AC-12 = I_{th} , alternating voltage		A	10			
	- 24 V	A	10			
	- 230 V	A	10			
	- 400 V	A	10			
• At DC-13, direct voltage L/R 200 ms		A	10			
	- 24 V	A	2			
	- 110 V	A	0.5			
	- 220 V	A	0.25			
- 440 V		A	0.1			
		A				
Minimum load capacity		V	17			
		mA	1			
Auxiliary releases						
			Undervoltage releases		Shunt releases	
Power consumption						
• During pick-up		VA/W	20.2/13		20.2/13	
	- AC voltages	W	20		13 ... 80	
• During uninterrupted duty		VA/W	7.2/2.4		--	
	- AC voltages	W	2.1		--	
Response voltage						
• Tripping	V		0.35 ... 0.7 x U_s		0.7 ... 1.1 x U_s	
• Pick-up	V		0.85 ... 1.1 x U_s		--	
Opening time maximum	ms		20			
Short-circuit protection for auxiliary and control circuits						
Melting fuses	operational class gG	A	10			
Miniature circuit breakers	C characteristic	A	6 (prospective short-circuit current < 0.4 kA)			



Conductor cross-sections for auxiliary and control circuits					
Type		3RV2.11	3RV2.21	3RV2.31, 3RV2.32	3RV27, 3RV28
Size		S00	S0	S2	S00, S0
Connection type		 Screw terminals			
Terminal screw		M3, Pozidriv size 2			
Operating devices	mm	Ø 5 ... 6			
Prescribed tightening torque	Nm	0.8 ... 1.2			
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected					
• Solid or stranded	mm ²	2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾			
• Finely stranded with end sleeve (DIN 46228-1)	mm ²	2 x (0.5 ... 1.5) ¹⁾ , 2 x (0.75 ... 2.5) ¹⁾			
• AWG cables, solid or stranded	AWG	2 x (18 ... 14) ¹⁾ , 2 x (20 ... 16) ¹⁾			
Connection type		 Spring-type terminals			
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5			
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected					
• Solid or stranded	mm ²	2 x (0.5 ... 2.5)			
• Finely stranded without end sleeve	mm ²	2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve (DIN 46228-1)	mm ²	2 x (0.5 ... 1.5)			
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)			
Max. external diameter of the conductor insulation	mm	3.6			
Connection type		 Ring terminal lug connections			
Terminal screw		M3, Pozidriv size 2			
Operating devices	mm	Ø 5 ... 6			
Tightening torque	Nm	0.8 ... 1.2			
Usable ring terminal lugs	mm	d ₂ = min. 3.2, d ₃ = max. 7.5			
<ul style="list-style-type: none">• DIN 46234 without insulation sleeve• DIN 46225 without insulation sleeve• DIN 46237 with insulation sleeve• JIS C2805 Type R without insulation sleeve• JIS C2805 Type RAV with insulation sleeve• JIS C2805 Type RAP with insulation sleeve					



¹⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

Terminals for "Self-Protected Combination Motor Controllers (Type E) according to UL 508/UL 60947-4-1"

Type	3RV2928-1H
Prescribed tightening torque	Nm 2.5 ... 3
Conductor cross-sections	
• Front clamping point connected 	
- Solid	mm ² 1 ... 10
- Finely stranded with end sleeve	mm ² 1 ... 16
- Stranded	mm ² 2.5 ... 25
- AWG cables, solid or stranded	AWG 14 ... 3
- Terminal screw	M4
• Rear clamping point connected 	
- Solid	mm ² 1 ... 10
- Finely stranded with end sleeve	mm ² 1 ... 16
- Stranded	mm ² 1.5 ... 25
- AWG cables, solid or stranded	AWG 14 ... 6
- Terminal screw	M4
• Both clamping points connected 	
- Front clamping point:	
Solid	mm ² 1 ... 10
Finely stranded with end sleeve	mm ² 1 ... 10 ¹⁾ , 1 ... 6 ¹⁾
Stranded	mm ² 2.5 ... 10
AWG cables, solid or stranded	AWG 14 ... 6
Terminal screw	M4
- Rear clamping point:	
Solid	mm ² 1 ... 10
Finely stranded with end sleeve	mm ² 1 ... 10 ¹⁾ , 1 ... 16 ¹⁾
Stranded	mm ² 2.5 ... 10
AWG cables, solid or stranded	AWG 16 ... 3
Terminal screw	M4

¹⁾ The following can be connected when both clamping points are connected:

- Front 1 ... 10 mm² and rear 1 ... 10 mm²
- Front 1 ... 6 mm² and rear 1 ... 16 mm²



Overview

S00 MSP with laterally mounted undervoltage release with leading auxiliary switch



3RV Motor Starter Protectors (MSP's) are built for a world of applications while meeting the requirements of control users worldwide. Each MSP features a manual ON/OFF switch, a Class 10 adjustable bimetallic overload relay (Class 20 available in the two largest frame sizes), and magnetic trip elements for short circuit protection.

Construction

The motor starter protectors are available in four sizes:

- Size S00 - 3RV201
Maximum rated current is 16 Amps. Suitable for motors up to 10 hp at 600V. Available in both screw terminal and spring-type terminal versions.
- Size S0 - 3RV202
Maximum rated current is 40 Amps. Suitable for motors up to 20 hp at 600V. Available in both screw terminal and spring-type terminal versions.

- Size S2 - 3RV203
Maximum rated current is 50 Amps. Suitable for motors up to 50 hp at 600V.
- Size S3 - 3RV104
Maximum rated current is 100 Amps. Suitable for motors up to 100 hp at 600V.

Functions

Releases

3RV motor starter protectors are equipped with bimetallic-based, inverse-time delayed overload releases - electromagnetic short-circuit releases.

The overload releases can be set in accordance with the load current. The overcurrent releases are permanently set to a value 13 times the rated current and thus enable trouble-free start-up of motors.

The scale cover can be sealed to prevent unauthorized adjustments to the set current.

Release classes

The release classes of thermally delayed releases are based on the tripping time (t_A) at 7.2 times the operational current in cold state (excerpt from IEC 60 947-4):

- CLASS 10 $A \ 2 \text{ s} < t_A < 10 \text{ s}$
- CLASS 10 $4 \text{ s} < t_A < 10 \text{ s}$
- CLASS 20 $6 \text{ s} < t_A < 20 \text{ s}$
- CLASS 30 $9 \text{ s} < t_A < 30 \text{ s}$

The release must trip within this time!

Operating mechanisms

S00, S0, S2 and S3 MSP's are actuated via a rotary operating mechanism. If the MSP trips, the rotary operating mechanism switches to the tripped position to indicate this. Before the MSP is reclosed, the rotary operating mechanism must be reset manually to 0 position, in order to prevent the former from closing by mistake before the fault has been cleared.

In the case of MSP's with rotary operating mechanisms, an electrical signal can be output via a signalling switch to indicate that the MSP has tripped.

All operating mechanisms can be locked in 0 position with a padlock (shackle diameter 3.5 to 4.5 mm).

Application

Operating conditions

3RV MSP's are suitable for use in any climate. They are designed for operation in closed rooms under normal conditions (e.g. no dust, corrosive vapours or harmful gases). Suitable enclosures must be provided for installation in dusty or damp rooms.

Motor Protection

3RV MSP's use bimetallic heater elements to provide class 10 or 20 overcurrent protection for both AC and DC motors. The bimetallic heaters sense the motor current directly, so the overloads are insensitive to high frequencies, harmonic waves and sinusoidal currents and voltages.

Each MSP has a fourth bimetallic strip that reacts only to the ambient temperature inside the control panel. This ambient compensation prevents the MSP from nuisance tripping when the panel temperature is higher than the ambient temperature of the motor.

A built-in differential trip bar causes the MSP to trip faster on a phase loss condition, to help reduce motor damage from phase loss.

Magnetic trip elements in each MSP take the device off line when it senses currents of 13 times the maximum FLA dial setting.

3RT1	0	1	1	-	0	A	A	1	0
SIRIUS MSP or Circuit Breaker	Application 0 = Motor Protection 7 = UL 489	Frame Size 3 = S2 4 = S3	Standard		Amperage Range Possible choices listed below see page 1/4-1/7 for an entire listing 0, 1, 4	B through K	Class A = 10	Terminal Type 1 = Screw 2 = Spring Loaded 4 = Ring Lug	Auxiliary Switch
3RV2	0	1	1	-	0	A	A	1	0
SIRIUS Innovations MSP or Circuit Breaker	Application 0 = Motor Protection 7 = UL 489	Frame Size 1 = S00 2 = S0	Standard		Amperage Range Possible choices listed below see page 1/4-1/7 for an entire listing 0, 1, 4	B through K	Class A = 10	Terminal Type 1 = Screw 2 = Spring Loaded 4 = Ring Lug	Auxiliary Switch
3RV1	0	1	1	-	0	A	A	1	0
SIRIUS MSP or Circuit Breaker	Application 0 = Motor Protection 7 = UL 489	Frame Size 3 = S2 4 = S3	Standard		Amperage Range Possible choices listed below see page 1/4-1/7 for an entire listing 0, 1, 4	B through K	Class A = 10 B = 20	Terminal Type 1 = Screw 2 = Spring Loaded	Auxiliary Switch

Note: MPS's and Contactors of the same frame size are made to easily fit together with the use of a link module.

3RV Motor Starter Protectors

General Data

• Revised •
10/25/15

SIRIUS



Mounting accessories

Applications:

The 3RV MSP's can be used in a variety of applications:

As a manual starter

All 3RV MSP's are UL listed as Manual Motor Controllers per UL508. This makes them ideal for applications requiring simple manual starting and stopping of motors. A separate short circuit protective device, such as a circuit breaker or fuses, is still required ahead of the MSP. This up-stream protective device should be sized per NEC code, not to exceed 400% of the maximum FLA adjustment dial setting.

As a component in a group installation

A group motor installation indicates multiple motor controllers under one short circuit protective device, such as a circuit breaker. 3RV MSP's have a group installation short-circuit current rating of 65 kA at 480V and up to 30kA at 600V. By using a link module, a 3RT contactor can be directly mounted to the load side of the MSP.

3RV MSP's have been UL tested with and without 3RT contactors for group installation.

As a Self-protected manual combination starter, Type E.

Most 3RV MSP's have also been UL listed as UL508 Type E, Self-protected Manual Combination Starters. This UL listing allows the MSP to be mounted in a manually operated machine without having to add separate short circuit protection upstream.

These devices have a short circuit current rating of 65 kA @ 240V, 480Y/277V and up to 30kA @ 600Y/347V.

Terminals for "Combination Motor Controller Type E" to UL 508

The 3RV MSP for motor protection is approved according to UL 508 as "Combination Motor Controller Type E".

As of July, 2001, UL 508 demands at line-side of the device used for this purpose an increased clearance and creepage distance (1" or 2").

Here, the terminal block 3RV29 28-1H must be used for size S0. The block is simply screwed to the basic unit.

Basic units of size S2 are already compliant with new clearance and creepage distance requirements.

As part of a Combination Motor Controller, Type F

When a 3RT contactor is connected to the load side of a 3RV device that is rated as a "Manual Self-protected Combination Motor Controller, Type E", the assembly can be applied as a "Combination Motor Controller, Type F". This versions allows for remote starting and stopping of the motor load.

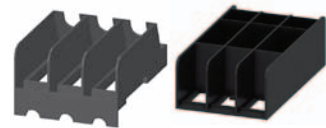
These assemblies have a short circuit current rating of 65 kA @ 240V, 480Y/277V and up to 30 kA @ 600Y/347V.

As a circuit breaker for export

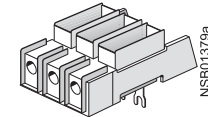
When exporting to many countries outside of the U.S. and North America, the 3RV can be applied as a thermal magnetic circuit breaker for use in motor branch circuits.

3RV29 28-1K

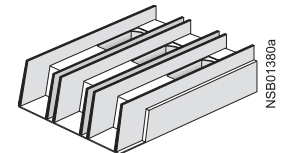
3RV29 38-1K



3RV29 28-1H

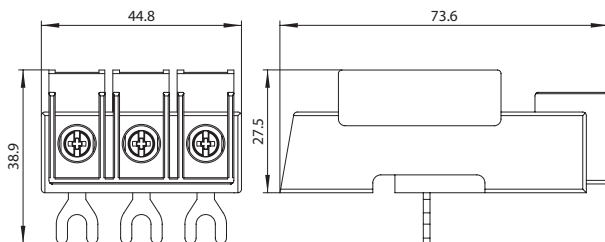


3RT19 46-4GA07

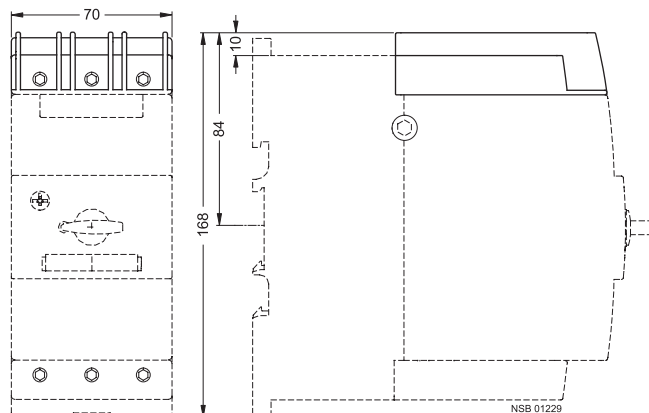


Terminals for "Combination Motor Controller Type E" to UL 508

3RV29 28-1H



3RT19 46-4GA07





Switching of direct current

3RV motor starter protectors for alternating currents are also suitable for DC switching.

The maximum permissible DC voltage per conducting path must, however, be adhered to. Higher voltages require a series connection with 2 or 3 conducting paths.

Example circuit for size S00 to S3 3RV motor starter protectors

Example circuit for size S00 to S3 3RV motor starter protectors	Maximum permitted DC voltage U_g	Notes
	150 V DC	Three-pole switching, non-grounded system ¹⁾ If there is no possibility of a ground fault, or if every ground fault is rectified immediately (ground-fault monitoring), then the maximum permitted DC voltage can be tripled.
	300 V DC	Two-pole switching, grounded system The grounded pole is always assigned to the individual conducting path, so that there are always 2 conducting paths in series in the event of a ground fault.
	450 V DC	Single-pole switching, grounded system 3 conducting paths in series. The grounded pole is assigned to the unconnected conducting path.

¹⁾ It is assumed that this circuit always provides safe disconnection even in the event of a double ground fault that bridges two contacts.

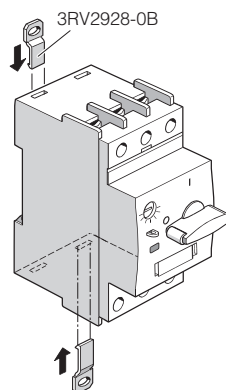
Design

Mounting

The motor starter protectors are secured in position by snapping them onto 35 mm standard mounting rails according to DIN EN 50 022. A mounting rail with a height of 15 mm is required for S3 MSP's. A 75-mm mounting rail can be used as an alternative here.

S2 and S3 MSP's can also be screwed directly onto a base-plate.

The push-in lugs 3RV29 28-0B are available for screw mounting of S00 and S0 MSP's.



Screw connection

3RV MSP's of sizes S00 and S0 are fitted with terminals with captive screws and clamping pieces, allowing the connection of 2 conductors with different cross-sections.

The box terminals of the S2 and S3 MSP's also enable 2 conductors with different cross-sections to be connected. With the exception of S3 MSP's which are equipped with 4 mm hexagon socket terminal screws, all terminal screws are tightened with a Pozidriv screwdriver size 2.

The box terminals of the S3 MSP's can be removed in order to connect conductors with cable lugs or connecting bars. A terminal cover is available to help prevent contact with shock protection and to ensure that the required clearances and creepage distances are maintained if the box terminals are removed.

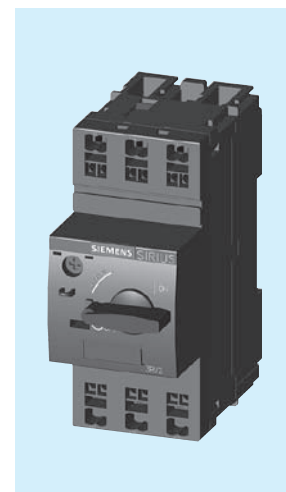
Spring-type connection ²⁾

As an alternative to screw terminals, S00 and S0 devices are also available with Spring-type terminal connection.

This screwless Spring-type terminal technique, as known for modular terminal blocks, offers shock-proof and vibration proof connection of conductors.

Devices with Spring-type connection allow independent connection of two conductors per terminal.

MSP with Spring-type terminal connection



¹⁾ It is assumed that this circuit always provides safe cut-out, even in the event of a double earth fault that bridges two contacts.

²⁾ For notes on Spring-type terminal connection, see section 19.



Characteristics

The time/current characteristic, the current limiting characteristics and the I^2t characteristics were determined in accordance with DIN VDE 0660 or IEC 60 947.

The tripping characteristic of the **inverse-time delayed overload releases** (thermal overload releases or 'a' releases) for DC and AC with a frequency of 0 to 400 Hz also apply to the time/current characteristic.

The characteristics apply to the cold state. At operating temperature, the tripping times of the thermal releases are reduced to approximately 25 %.

Under normal operating conditions, all three poles of the device must be loaded. The three main conducting paths must be connected in series in order to protect single-phase or DC loads.

With 2-pole and 3-pole loading, the maximum deviation in the tripping time for 3 times the setting current and upwards is $\pm 20\%$ and thus in accordance with DIN VDE 0165.

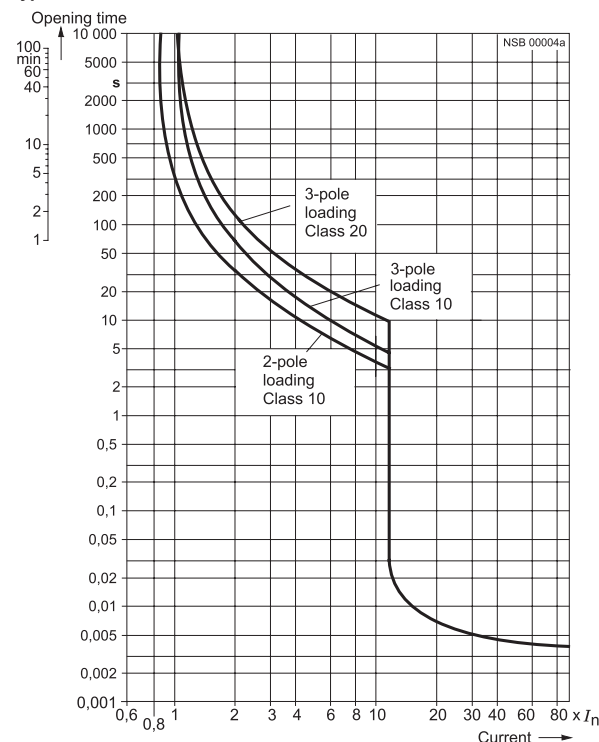
The tripping characteristics for the instantaneous, electromagnetic overcurrent releases

(short-circuit releases, 'n' releases) are based on the rated current I_n that represents the maximum value of the setting range for MSP's with adjustable overload releases. If the current is set to a lower value, the tripping current of the 'n' release is increased by a corresponding factor.

The characteristics of the electromagnetic overcurrent releases apply to frequencies of 50/60 Hz. Appropriate correction factors must be used for lower frequencies up to $16 \frac{2}{3}$ Hz, for higher frequencies up to 400 Hz and for DC.

The printed characteristic curve determined for the MSP relates to a specific setting range. It is, however, also valid as a schematic representation of MSP's with other current ranges.

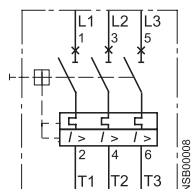
Typical time/current characteristic of 3RV



Circuit diagrams

Internal connections

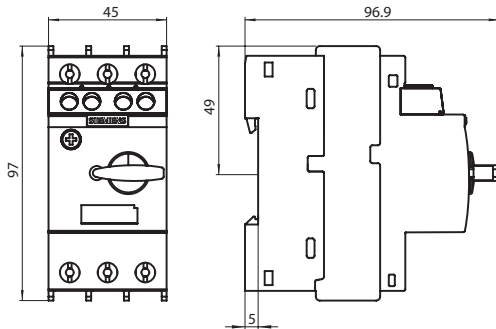
Motor starter protectors 3RV.



Dimension drawings

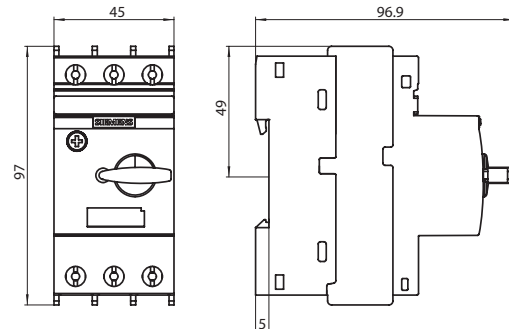
3RV2 MSP, size S00

3RV20 11

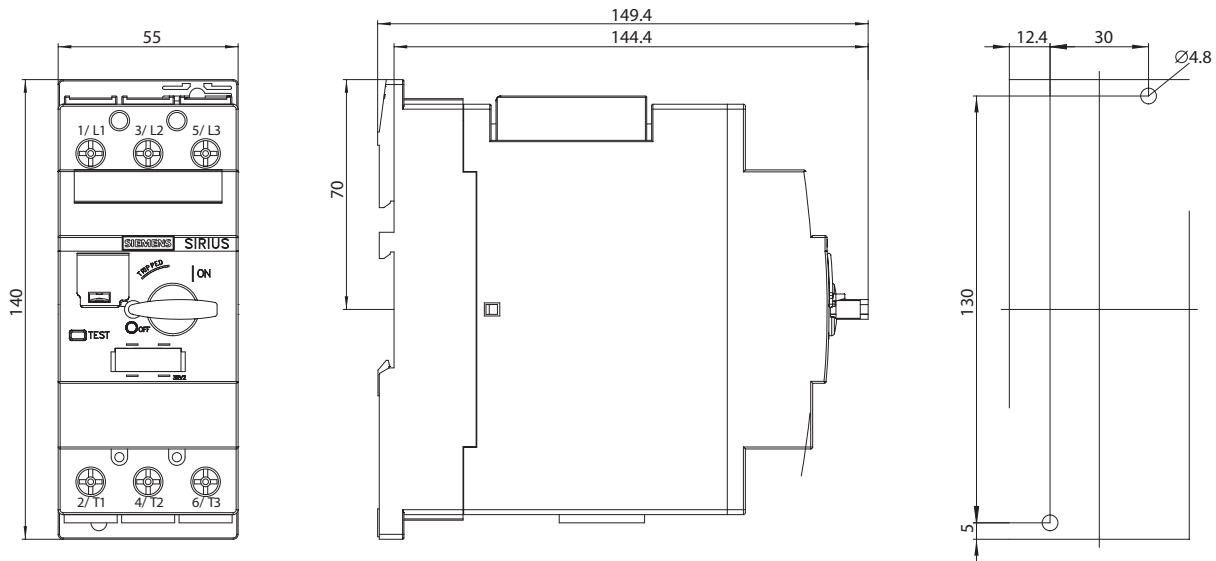


3RV2 MSP, size S0

3RV20 21



3RV2 MSP, size S2



3RV2.31 motor starter protector (<= 45A)

- 1) 2-pole lateral auxiliary switch
- 2) Signalling switch (S0-S3) or lateral auxiliary switch, 4-pole (S00-S3)
- 3) Auxiliary releases
- 4) Transverse auxiliary switch
- 5) Push-in lugs for screw mounting
- 6) Only for undervoltage release with leading auxiliary switch
- 7) Drilling template
- 8) 35 mm standard mounting rail acc. to EN 50 022
- 9) Mounting on 35 mm standard mounting rail, 15 mm high, acc. to EN 50 022 or on 75 mm standard mounting rail acc. to EN 50 023
- 10) 4 mm hexagon socket screw
- 11) Lockable in 0 position with shackle diameter 3.5 to 4.5 mm

3RV Motor Starter Protectors

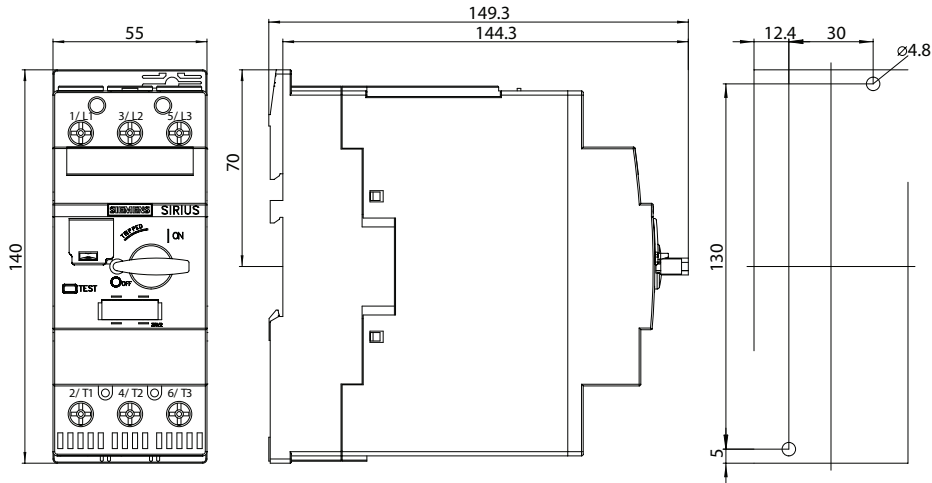
General Data

3RV
up to 100 A

• Revised •
10/25/15

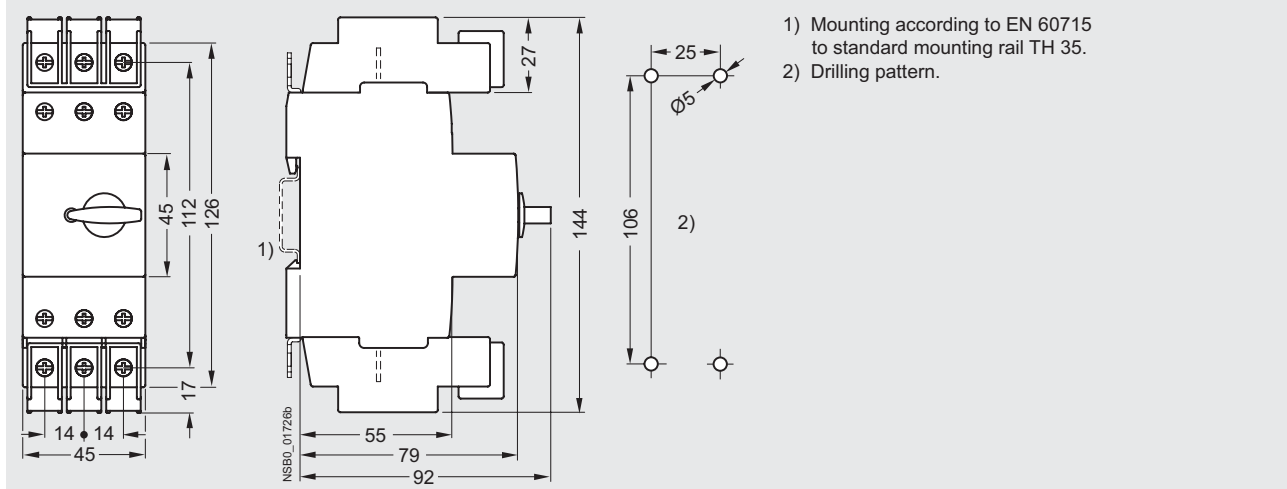


3RV2.32 MSP, size S2



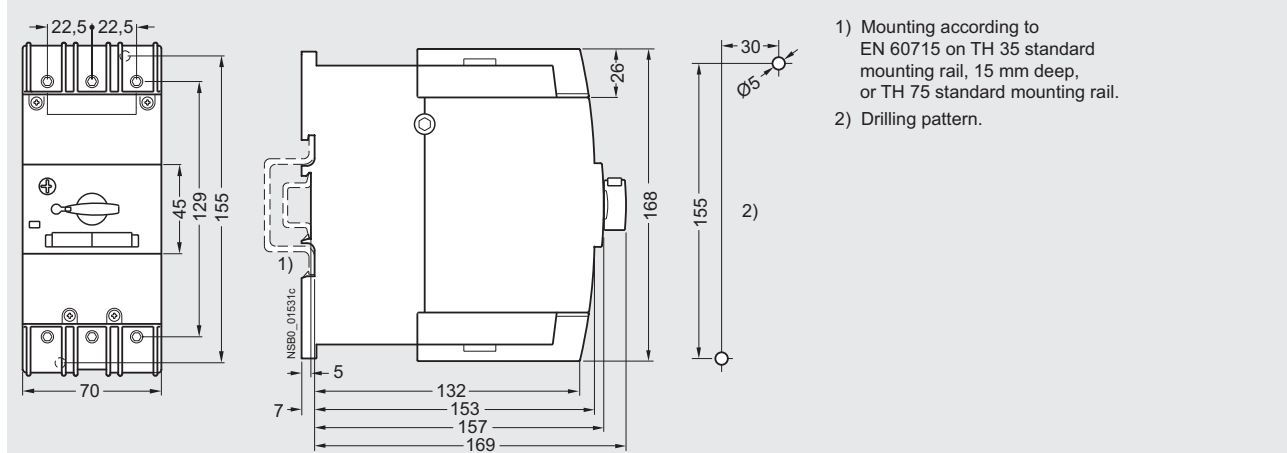
3RV27 and 3RV28 circuit breakers, size S00, S0 and S3

3RV27 21, 3RV28 21



3RV17 circuit breakers, size S3

3RV17 42





Overview

Mounting location and function

The 3RV2 motor starter protectors/circuit breakers have three main contact elements. In order to achieve maximum flexibility, auxiliary switches, signaling switches, auxiliary releases and isolator modules can be supplied separately.

These components are easily fitted to the switches without the use of any tools according to requirements.

Overview graphic, [see page 7/7](#).

Front side Note: <ul style="list-style-type: none"> A maximum of four auxiliary contacts with auxiliary switches can be mounted on each motor starter protector/circuit breaker. 	Transverse auxiliary switches, solid-state compatible transverse auxiliary switches 1 NO + 1 NC or 2 NO or 1 CO	An auxiliary switch block can be inserted transversely on the front. The overall width of the motor starter protectors/circuit breakers remains unchanged.
Left-hand side Notes: <ul style="list-style-type: none"> A maximum of four auxiliary contacts with auxiliary switches can be mounted on each motor starter protector/circuit breaker. Lateral auxiliary switches (two contacts) and signaling switches can be mounted separately or together. The signaling switch cannot be used for the 3RV27 and 3RV28 circuit breakers. 	Lateral auxiliary switches (2 contacts) 1 NO + 1 NC or 2 NO or 2 NC Lateral auxiliary switches (4 contacts) 2 NO + 2 NC	One of the three lateral auxiliary switches can be mounted on the left side per motor starter protector/circuit breaker. The contacts of the auxiliary switch close and open together with the main contacts of the motor starter protector/circuit breaker. The width of the lateral auxiliary switch with two contacts is 9 mm. One lateral auxiliary switch with four contacts can be mounted on the left side per motor starter protector/circuit breaker. The contacts of the auxiliary switch close and open together with the main contacts of the motor starter protector/circuit breaker. The width of the lateral auxiliary switch with four contacts is 18 mm.
	Signaling switches Tripping 1 NO + 1 NC Short circuit 1 NO + 1 NC	One signaling switch can be mounted on the left side of each motor starter protector. The signaling switch has two contact systems. One contact system always signals <u>tripping</u> irrespective of whether this was caused by a short circuit, an overload or an auxiliary release. The other contact system only switches in the event of a short circuit. There is no signaling as a result of <u>switching off</u> with the actuator. In order to be able to switch on the motor starter protector again after a short circuit, the signaling switch must be reset manually after the error cause has been eliminated. The overall width of the signaling switch is 18 mm.
Right-hand side Notes: <ul style="list-style-type: none"> One auxiliary release can be mounted per motor starter protector/circuit breaker. Accessories cannot be mounted at the right-hand side of the 3RV21 motor starter protectors for motor protection with overload relay function. 	Auxiliary releases Shunt releases or Undervoltage releases or Undervoltage releases with leading auxiliary contacts 2 NO	For remote-controlled tripping of the motor starter protector/circuit breaker. The release coil should only be energized for short periods (see circuit diagrams). Trips the motor starter protector/circuit breaker when the voltage is interrupted and prevents the motor from being restarted accidentally when the voltage is restored. Used for remote-controlled tripping of the motor starter protector/circuit breaker. Particularly suitable for EMERGENCY-STOP disconnection by way of corresponding EMERGENCY-STOP pushbuttons according to DIN EN 60204-1. Function and use as for the undervoltage release without leading auxiliary contacts, but with the following additional function: the auxiliary contacts will open in switch position OFF to deenergize the coil of the undervoltage release, thus interrupting energy consumption. In the "tripped" position, these auxiliary contacts are not guaranteed to open. The leading contacts permit the motor starter protector/circuit breaker to reclose. The overall width of the auxiliary release is 18 mm.
Top Notes: <ul style="list-style-type: none"> The isolator module cannot be used for the 3RV27 and 3RV28 circuit breakers. The isolator module for size S2 <ul style="list-style-type: none"> can only be used with 3RV2 motor starter protectors/circuit breakers up to max. 65 A cannot be used with the transverse auxiliary switch The isolator module covers the terminal screws of the transverse auxiliary switch. If the isolator module is used, we therefore recommend that either the lateral auxiliary switches be fitted or that the isolator module not be mounted until the auxiliary switch has been wired. 	Isolator modules	Isolator modules can be mounted to the upper connection side of the motor starter protectors. The supply cable is connected to the motor starter protector through the isolator module. The plug can only be unplugged when the motor starter protector is open and isolates all 3 poles of the motor starter protector from the network. The shock-protected isolation point is clearly visible and secured with a padlock to prevent reinsertion of the plug.

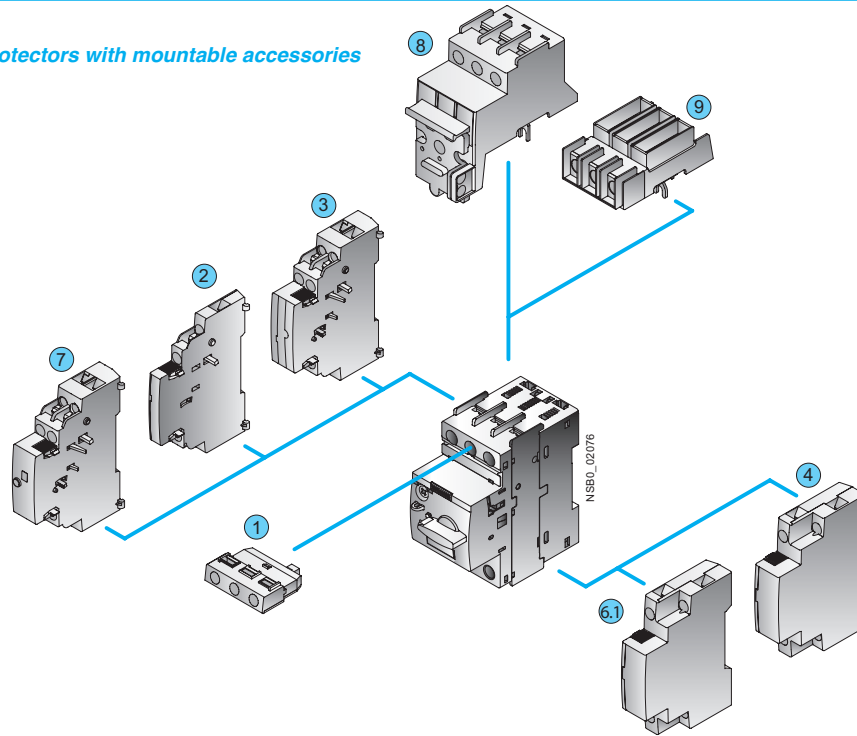
For a complete overview of which accessories can be used for the various motor starter protectors/circuit breakers, [see page 7/2](#)



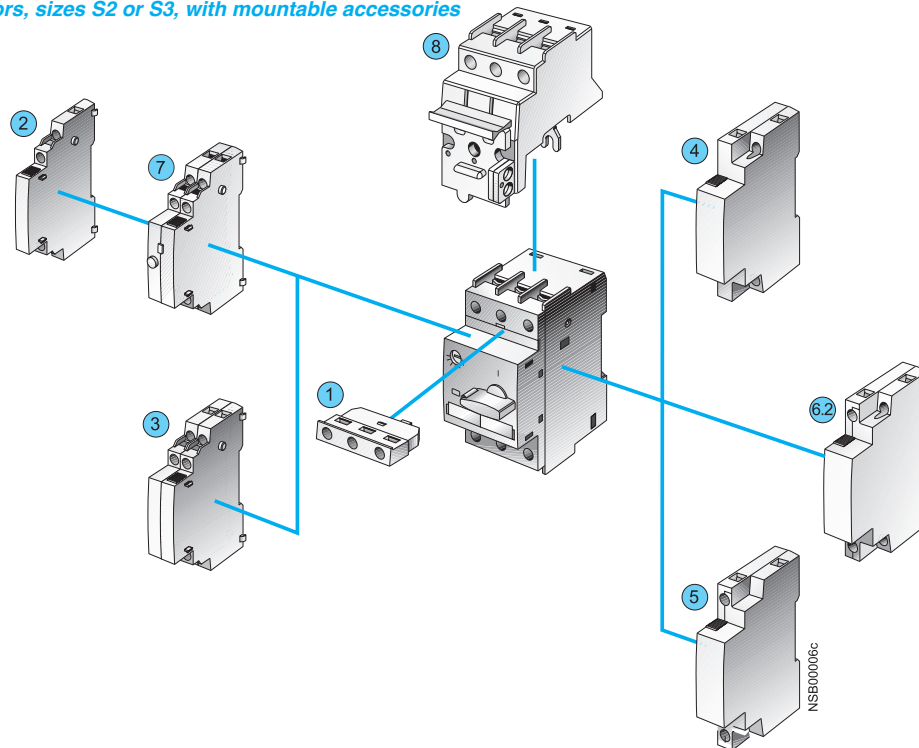
Mountable accessories

Overview

S00 and S0 motor starter protectors with mountable accessories



Motor starter protectors, sizes S2 or S3, with mountable accessories



Mountable accessories for all sizes S00 ... S3

- ① Transverse auxiliary switch
- ② Lateral auxiliary switch with 2 contacts
- ③ Lateral auxiliary switch with 4 contacts
- ④ Shunt release
- ⑤ Undervoltage release

Mountable accessories

- ⑥.1 Undervoltage release with leading auxiliary contacts (can not be used with 3RV21 circuit breakers)
- ⑥.2 Undervoltage release with leading auxiliary contacts

for sizes

S00, S0
S2, S3

Mountable accessories

- ⑦ Signaling switch (can not be used with 3RV27 and 3RV28 circuit breakers)
- ⑧ Isolator module (can not be used with 3RV27 and 3RV28 circuit breakers)
- ⑨ Terminal block E

for sizes

S00 ... S3
S0 and S2

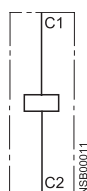


Circuit diagrams

Internal connections

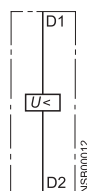
Shunt release

3RV19 02-1D / 3RV29 02-1D

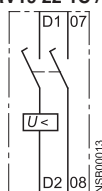


Undervoltage release

3RV19 02-1A / 3RV29 02-1A

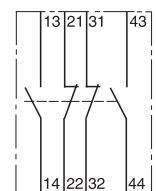


Undervoltage release with leading auxiliary contacts

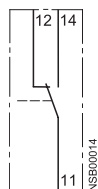
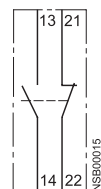
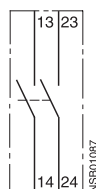
3RV19 12-1C / 3RV29 12-1C
3RV19 22-1C / 3RV29 22-1C

Lateral auxiliary switch with 4 contacts

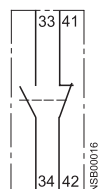
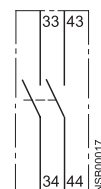
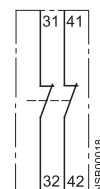
3RV19 01-1J / 3RV29 01-1J



Transverse auxiliary switch

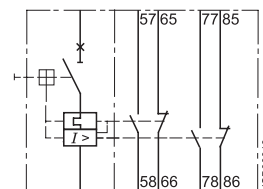
3RV19 01-1D
3RV29 01-1D
3RV19 01-1G
3RV29 01-1G3RV19 01-1E
3RV29 01-1E
3RV19 01-2E
3RV29 01-2E3RV19 01-1F
3RV29 01-1F

Lateral auxiliary switch with 2 contacts

3RV19 01-1A
3RV29 01-1A
3RV19 01-2A
3RV29 01-2A3RV19 01-1B
3RV29 01-1B
3RV19 01-2B
3RV29 01-2B3RV19 01-1C
3RV29 01-1C
3RV19 01-2C
3RV29 01-2C

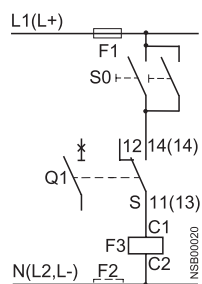
Signalling switch

3RV19 21-1M / 3RV29 21-1M

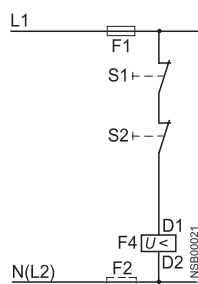


External connections

Shunt release



Undervoltage release

S0; S1; S2
Q1
S

F1; F2

F3
F4OFF pushbuttons in system
Motor starter protectors
Auxiliary switch of
MSP Q1
Fuses (gL/gG)
max. 10 A
Shunt release
Undervoltage release

3RV Motor Starter Protectors

General Data

• Revised •
10/25/15

SIRIUS

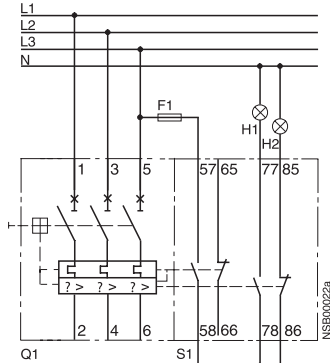


Mountable accessories

Circuit diagrams

Typical circuits

3RV2 MSP's with 3RV29 21-1M signalling switch



H1: "Short circuit" signal

H2: "Overload" or "Tripped by auxiliary release" signal

H1; H2 Indicator lights

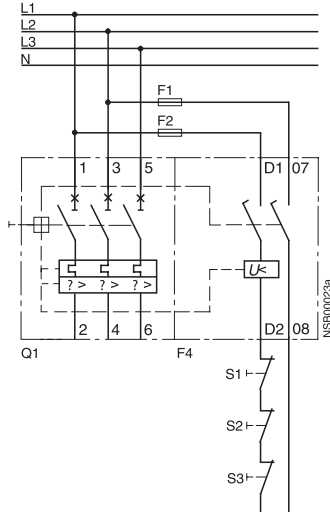
F1 Fuses (gL/gG) max. 10 A

Q1 MSP

S1 Signalling switch

Separate "Tripped" and "Short circuit" signals

Motor starter protectors tripped by means of pushbutton or EMERGENCY STOP button in the system



The leading auxiliary contacts open in "OFF" position of the MSP to switch off the coil voltage of the undervoltage release, thus avoiding power consumption in switched off state.

In the "tripped" position of the MSP, these contacts are not guaranteed to open.

F1; F2 Fuses (gL/gG) max. 10 A

Q1 MSP

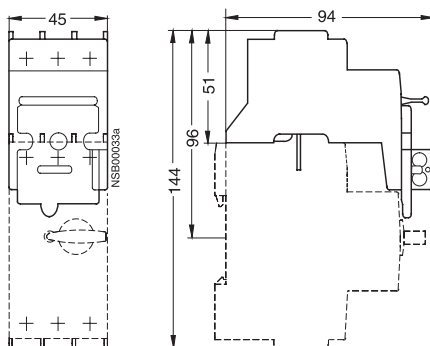
F4 Undervoltage release

S1; S2, S3 OFF pushbuttons in system

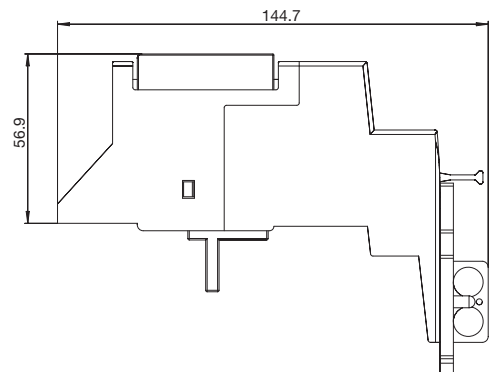
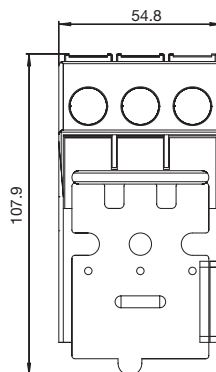
Dimension drawings

Isolator modules

3RV29 28-1A
for MSP's size S00, S0



3RV29 38-1A
for MSP's size S2



For dimension drawings of auxiliary switches, signalling switches and auxiliary releases, see page 1/33 and 1/34.

**Overview****Busbar adapters**

The MSP's are mounted directly with the aid of busbar adapters on fastbus-busbar systems with 40 mm and 60 mm centerline spacing, in order to save space and to reduce wiring times and costs.

Fastbus-busbar adapters for busbar systems with 40 mm centerline spacing are suitable for copper busbars with a width of 12 mm to 15 mm, while those with 60 mm centerline spacing are suitable for widths of 12 mm to 30 mm. The busbars can be 4 to 5 mm or 10 mm thick.

The MSP's are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

Refer to page 1/10 for busbar adapters for specific MSP's and accessories.

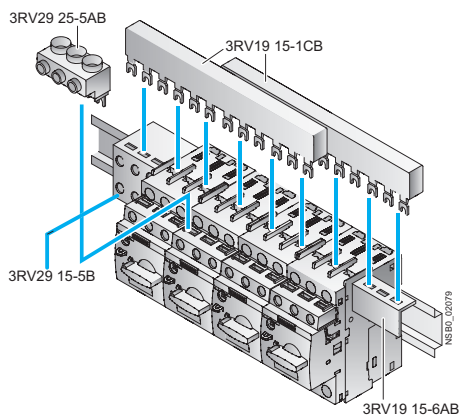
Further busbar adapters for snap-mounting direct-on-line starters and reversing starters, as well as additional accessories such as line terminals and outgoing terminals, busbar copper, etc., can be found in Section 5.

Insulated three-phase busbar system

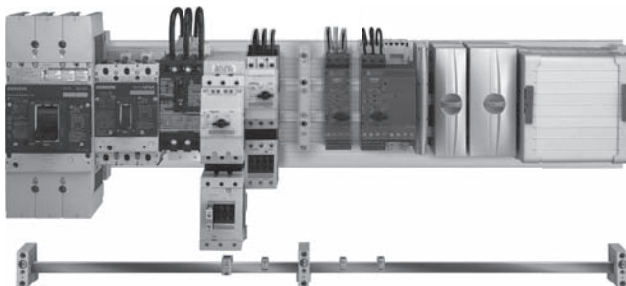
Three-phase busbar systems provide an easy, time-saving and clearly arranged means of feeding 3RV2 motor starter protectors with screw terminals. They can be used for the different types of motor starter protector up to 32 A. The 3RV19 15 three-phase busbar systems are generally unsuitable for the 3RV21 motor starter protectors for motor protection with overload relay function and for the 3RV27 and 3RV28 circuit breakers according to UL 489 / CSA C22.2 No. 5-02.

The busbars are suitable for between 2 and 5 circuit breakers/motor starter protectors. However, any kind of extension is possible by clamping the tags of an additional busbar (rotated by 180°) underneath the terminals of the respective last motor starter protector.

A combination of motor starter protectors of different sizes is possible. The motor starter protectors are supplied by appropriate feeder terminals.

**SIRIUS three-phase busbar system size S00/S0**

The three-phase busbar systems are finger-safe. They are designed for any short-circuit stress which can occur at the output side of connected motor starter protectors.

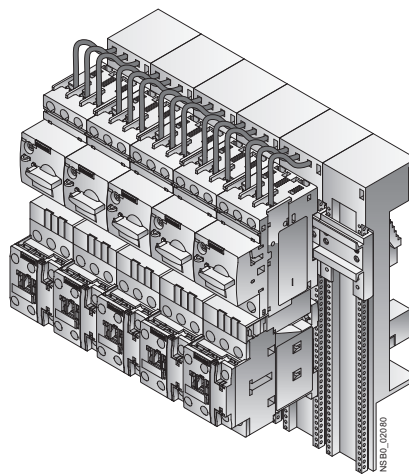
SIRIUS MSP's and combination starters with fastbus-busbar adapters snapped onto busbars**8US busbar adapters for 60 mm systems**

The motor starter protectors are mounted directly with the aid of busbar adapters on busbar systems with 60 mm center-to-center clearance in order to save space and to reduce infeed times and costs.

The busbar adapters for busbar systems with 60 mm center-to-center clearance are suitable for copper busbars with a width of 12 mm to 30 mm. The busbars can be 5 mm or 10 mm thick.

The motor starter protectors are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

For further busbar adapters for snap-mounting direct-on-line starters and reversing starters as well as additional accessories such as line terminals and outgoing terminals, flat copper profile, etc., can be found in Section 5.

**SIRIUS load feeders with busbar adapters snapped onto busbars**

The three-phase busbar systems can also be used to construct "Type E Starters" according to UL/CSA. Special feeder terminals must be used for this purpose however (see "Selection and Ordering Data" on page 1/8).

3RV Motor Starter Protectors

General Data

• Revised •
10/25/15

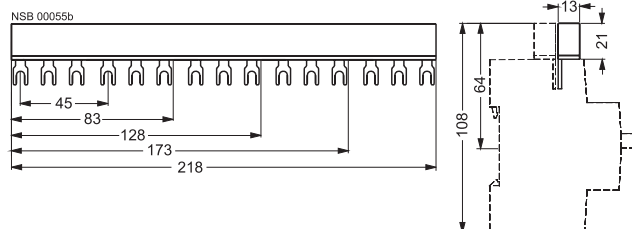


Busbar accessories

Dimension drawings

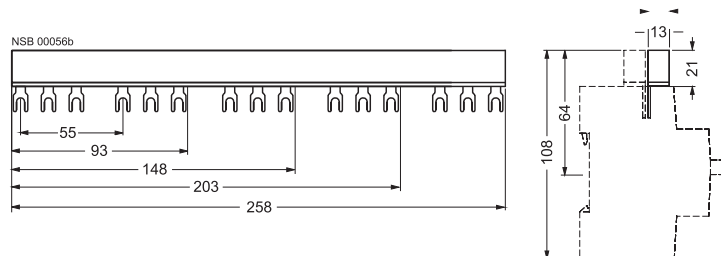
3RV19 15-1.. 3-phase busbar

for S00 and S0 MSP's, modular spacing 45 mm
for 2 MSP's 3RV19 15-1AB
for 3 MSP's 3RV19 15-1BB
for 4 MSP's 3RV19 15-1CB
for 5 MSP's 3RV19 15-1DB



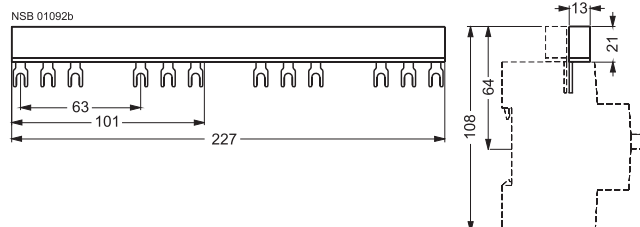
3RV19 15-2.. 3-phase busbar

for S00 and S0 circuit-breakers, modular spacing 55 mm
for 2 MSP's with accessories 3RV19 15-2AB
for 3 MSP's with accessories 3RV19 15-2BB
for 4 MSP's with accessories 3RV19 15-2CB
for 5 MSP's with accessories 3RV19 15-2DB



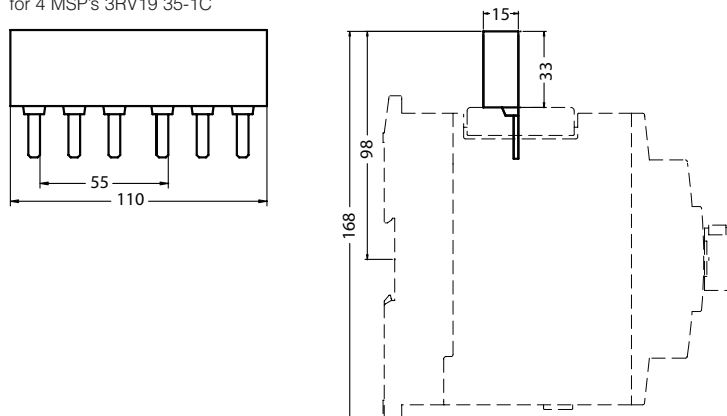
3RV19 15-3.. 3-phase busbar

for S00 and S0 MSP's, modular spacing 63 mm
for 2 MSP's with accessories 3RV19 15-3A
for 3 MSP's with accessories 3RV19 15-3B
for 4 MSP's with accessories 3RV19 15-3C



3RV19 35-1.. 3-phase busbar

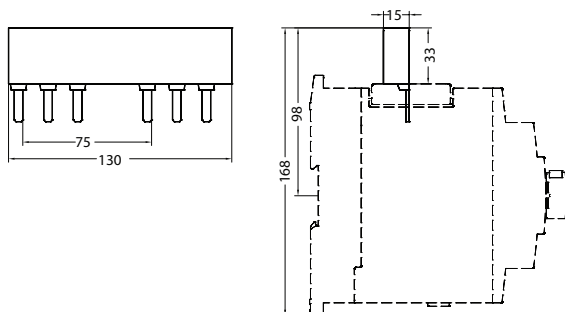
for S2 MSP, modular spacing 55 mm
for 2 MSP's 3RV19 35-1A
for 3 MSP's 3RV19 35-1B
for 4 MSP's 3RV19 35-1C



Dimension drawings

3RV19 35-3.. 3-phase busbar

for S2 MSP, modular spacing 75 mm
for 2 MSP's with accessories 3RV19 35-3A
for 3 MSP's with accessories 3RV19 35-3B
for 4 MSP's with accessories 3RV19 35-3C



3RV29 25-5AB. 3-phase line-side terminals

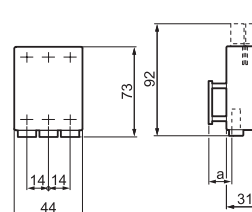
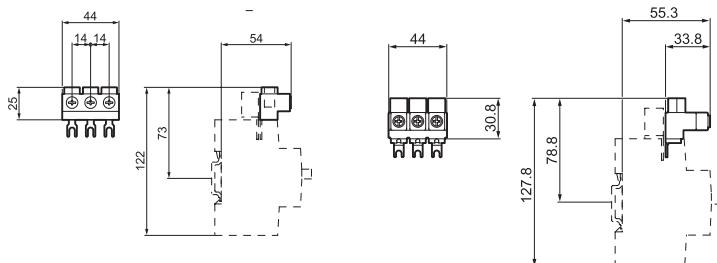
connection from above,
size S00 and S0

3RV29 35-5B
connection from above,
size S00 and S0

a) 3RV1. 1 19 mm
3RV1. 2 23 mm

3RV29 25-5EB 3-phase line-side terminal

connection from above,
size S0

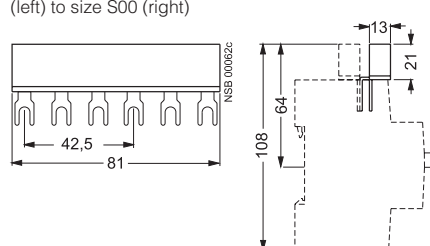
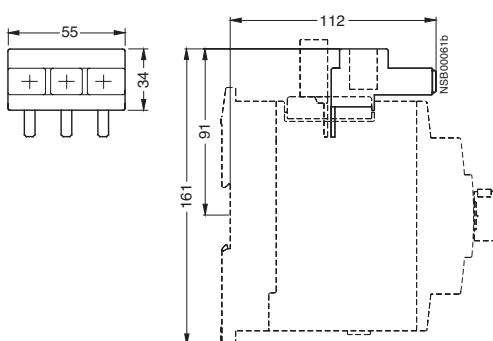


3RV19 35-5A 3-phase line-side terminal

for MSP size S2

3RV19 15-5DB Connector

For connecting a 3-phase busbar for
MSP's of the size S0
(left) to size S00 (right)

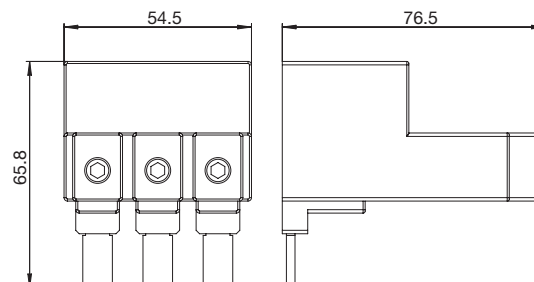
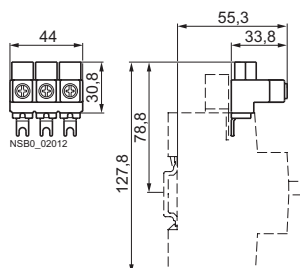


3RV19 25-5EB to construct "Type E Starters"

Connected from top, for motor starter protector size S0

3RV29 35-5E

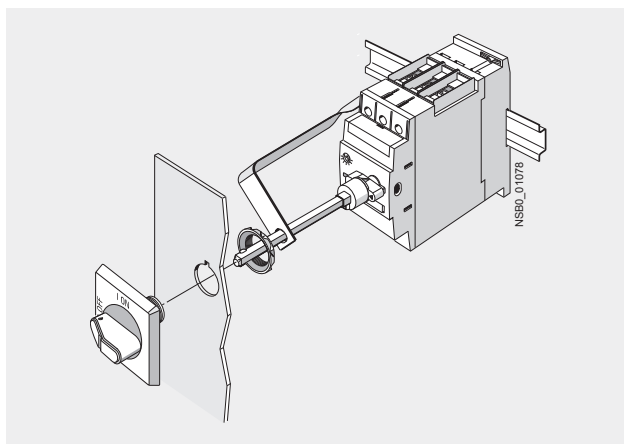
Connected from top, for motor starter protector size S2



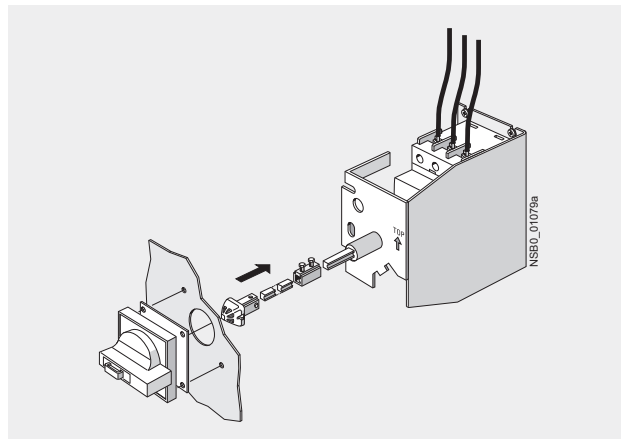
Overview

Door-coupling rotary operating mechanisms

Motor starter protectors with a rotary operating mechanism can be mounted in a control cabinet and operated externally by means of a door-coupling rotary operating mechanism. When the cabinet door with motor starter protector is closed, the operating mechanism is coupled. When the motor starter protector closes, the coupling is locked which prevents the door from being opened unintentionally. This interlock can be defeated by the maintenance personnel. In the OPEN position, the rotary operating mechanism can be secured against reclosing with up to 3 padlocks. Inadvertent opening of the door is not possible in this case either.



SIRIUS 3RV29 26-0K door-coupling rotary operating mechanism

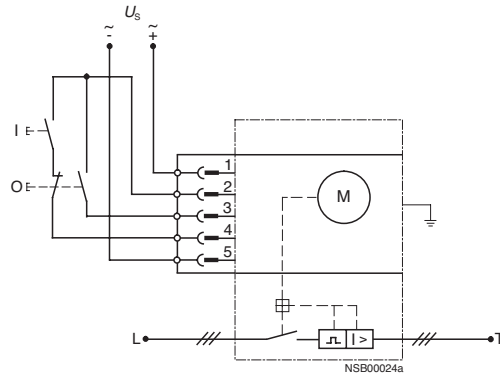


SIRIUS 3RV29 26-2B door-coupling rotary operating mechanism for arduous conditions

Circuit diagrams

Typical circuits

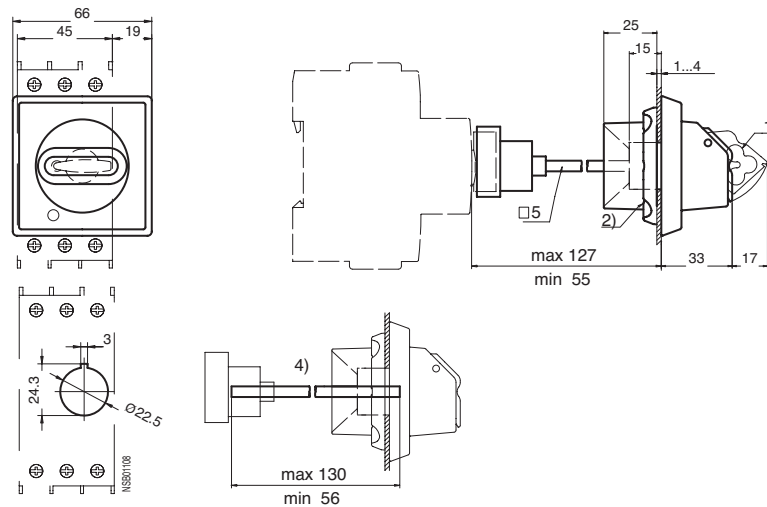
3RV1 MSP with 3RV19 36/3RV19 46 remote-controlled motorized operating mechanism



Dimensional drawings

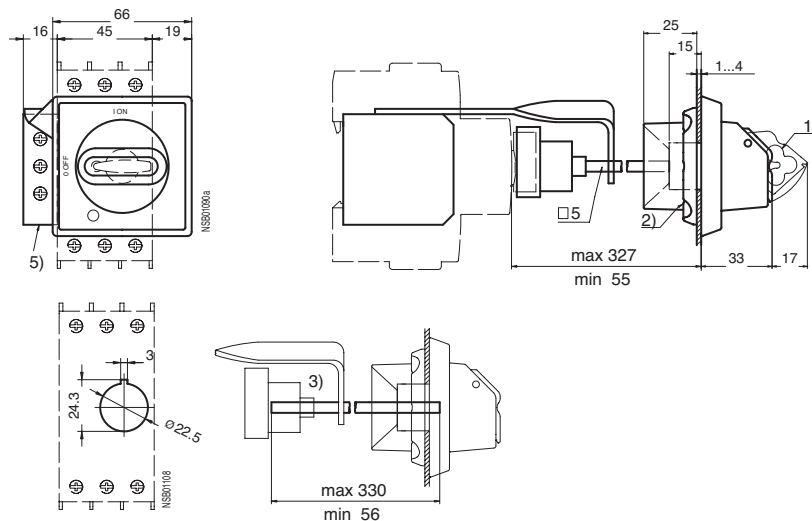
Door coupling rotary mechanism

3RV29 26-0B/3RV29 26-0C short shaft⁴⁾, for MSP sizes S00, S0, S2 and S3



- 1) Lockable in 0 position, with shackle diameter max. 8 mm
- 2) Mounting with screw cap
- 3) Supplied with a shaft length of 330 mm; adaptable by shortening of the shaft.
- 4) Supplied with a shaft length of 130 mm; adaptable by shortening of the shaft.
- 5) Grounding terminal 35 mm² and bracket for 330 mm shaft.

3RV29 26-0K/3RV29 26-0L long shaft (with bracket)³⁾, for MSP sizes S00, S0, S2 and S3



3RV Motor Starter Protectors

General Data

Rotary operating mechanisms

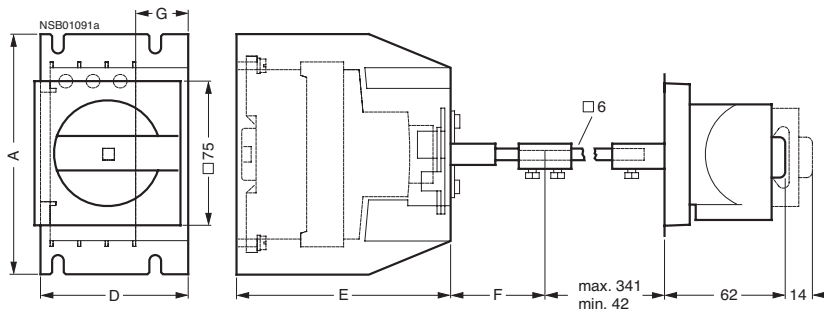
SIRIUS



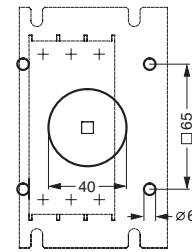
Dimension drawings

3RV29 .6-2. Door coupling rotary mechanism for heavy duty

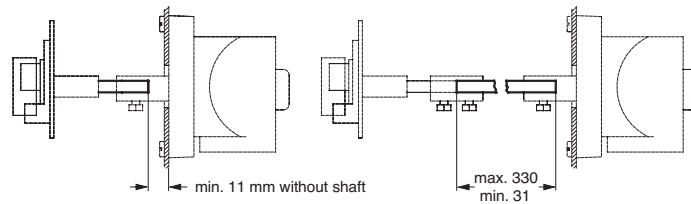
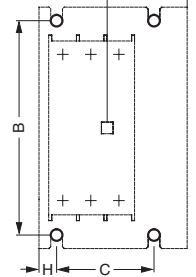
3RV29 26-2., 3RV29 36-2., 3RV29 46-2.
for sizes S00, S0, S2 and S3



Drilling template, door



Drilling template, base



Type	Size	Dimensions								
		A	B	C	D	E	F	G	H	I
3RV29 26-2.	S00, S0	125	111	50	77	112	50	27	9	42
3RV29 36-2.	S2	170	144	60	87	162	50	27	10	47
3RV29 46-2.	S3	194	180	60	100	187	48	25	10	53

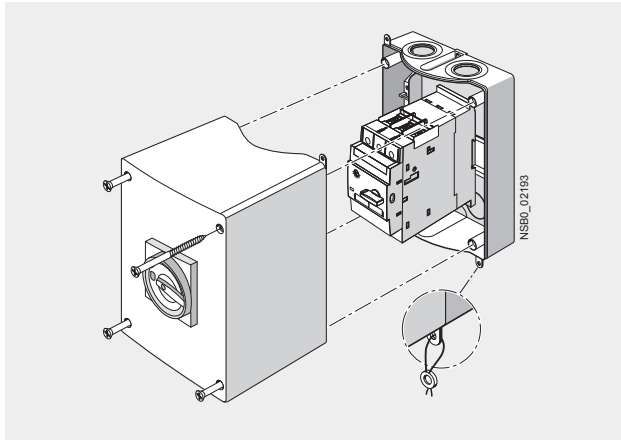
Overview

Enclosure

For stand-alone installation of motor starter protector size S2 ($I_{n\ max} = 65\ A$), molded-plastic enclosures for surface mounting are available.

When installed in a molded-plastic enclosure the motor starter protectors have a rated operational voltage U_e of 500 V.

The molded-plastic enclosures are designed to degree of protection IP55.



Enclosures for surface mounting

All enclosures are equipped with N and PE terminals. There are two knock-out cable entries for cable glands at the top and two at the bottom; also on the rear corresponding cable entries are scored. There is a knockout on the top of the enclosure for indicator lights that are available as accessories.

In the enclosure for motor starter protector size S2 there is also room for the laterally mounted auxiliary release. There is no provision for installing a motor starter protector with a signaling switch.

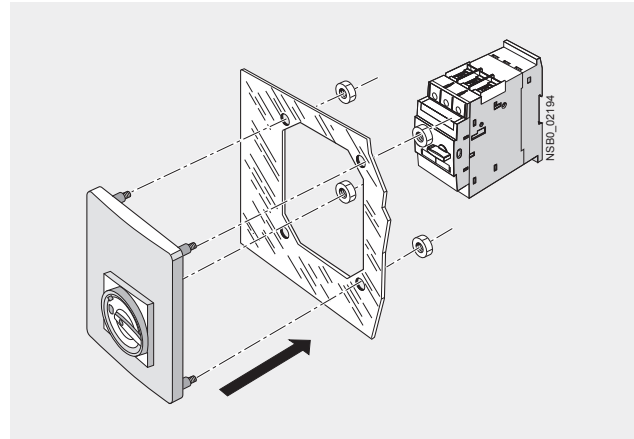
The molded-plastic enclosures of the size S2 motor starter protectors are fitted with a rotary operating mechanism.

The enclosures can be supplied with either a black rotary operating mechanism or with an EMERGENCY-STOP rotary operating mechanism with a red/yellow knob.

The rotary operating mechanisms can be locked in the Open position with up to 3 padlocks.

Front plates

Motor starter protectors are frequently required to be actuated in any enclosure. Front plates equipped with a rotary operating mechanism for motor starter protector sizes S2 and S3 are available for this purpose.



Front plate for size S2

3RV Motor Starter Protectors

General Data

• Revised •
10/25/15

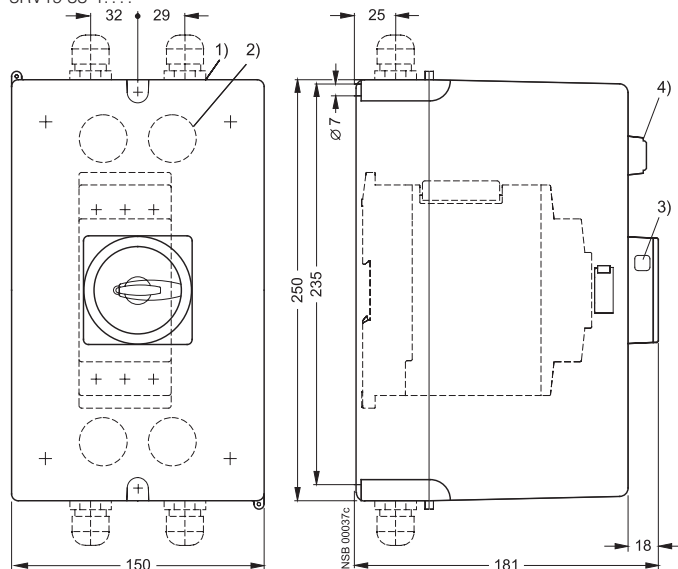


Mounting accessories

Dimension drawings

3RV19 . 3-1.... Cast aluminum enclosure for wall mounting

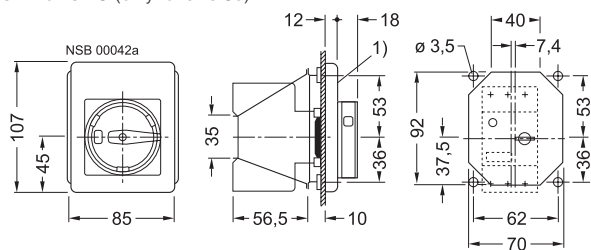
for MSP's of size S2
3RV19 33-1....



- 1) Knock-outs for M32 (left) and M40 (right).
- 2) M32 knock-outs for rear-side cable entry.
- 3) Opening for padlock with shackle diameter max. 8 mm.
- 4) Indicator light 3RV19 03-5.

Molded-plastic front plate 3RV19 23-4.

for MSP sizes S0, S2, S3
3RV29 23-4B
3RV29 23-4E
3RV19 23-4G (only for size S0)



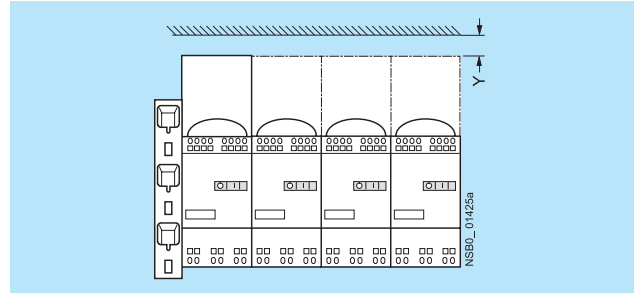


Design

Installation guidelines

Distance in Y direction from live, earthed or insulated parts according to IEC 60947-4: 10 mm.

In addition, the installation guidelines for motor starter protectors or fuseless load feeders including the clearances must be complied with.



Technical specifications

Type		3RV29 .7
Rated operational voltage U_e		
• IEC		
- 10 % overvoltage	V	500
- 5 % overvoltage	V	525
• UL/CSA	V	600
Rated frequency	Hz	50/60
Rated current I_n	A	63
Permissible ambient temperature		
• During storage/transport	°C	-50 ... +80
• During operation	°C	-20 ... +60
Permissible rated current of the 3RV10 11 motor starter protectors (size S00) at control cabinet internal temperature		
• +60 °C	%	100
Permissible rated current of the 3RV10 21 motor starter protectors (size S0) up to 16 A at control cabinet internal temperature		
• +60 °C	%	100
Permissible rated current for 3RV1. 21 motor starter protectors (size S0) from 16 A at control cabinet internal temperature		
• +40 °C	%	100
• +60 °C	%	87
Degree of protection acc. to IEC 60529		IP20 ¹⁾
Touch protection acc. to IEC 61140		Finger-safe
Conductor cross-sections for main circuit infeed		
• Solid, stranded:	mm ²	4 ... 25
• Finely stranded with end sleeve	mm ²	4 ... 25
• Finely stranded without end sleeve	mm ²	6 ... 25
• AWG cables, solid or stranded	AWG	10 ... 3
Conductor cross-sections of terminal block		
• Solid	mm ²	1.5 ... 6
• Finely stranded with end sleeve	mm ²	1.5 ... 4
• Finely stranded without end sleeve	mm ²	1.5 ... 6
• AWG cables, solid or stranded	AWG	15 ... 10

¹⁾ In infeed terminal compartment without a conductor connected: IP00.

3RV Motor Starter Protectors

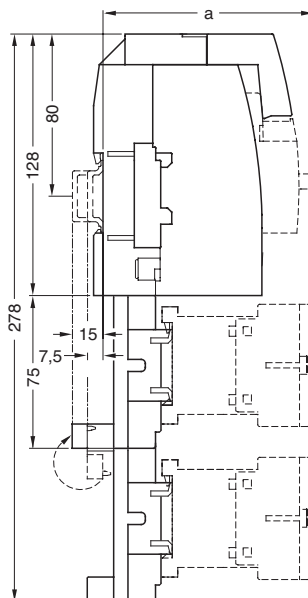
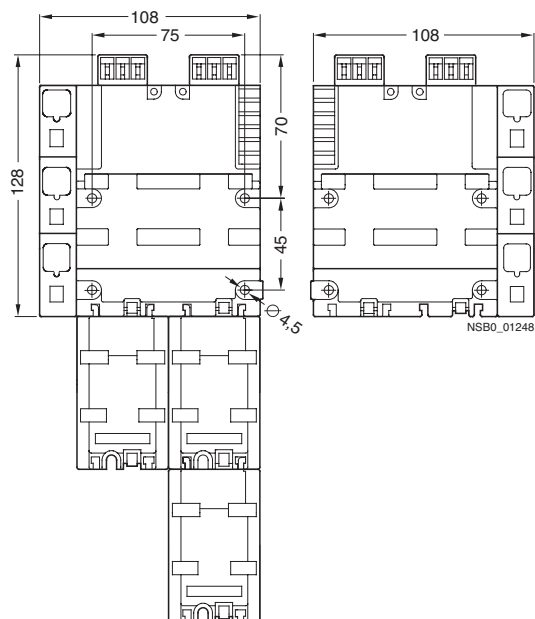
General Data

3RV Cage clamp infeed system



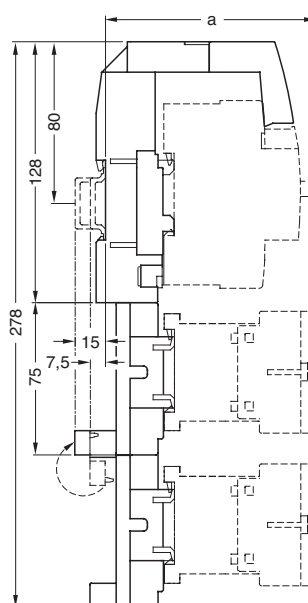
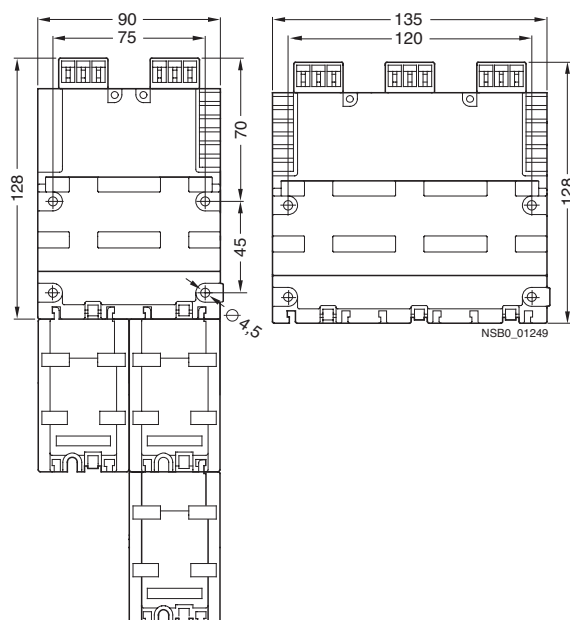
Cage Clamp infeed system

3-phase busbars with line-side terminals
for 2 circuit-breakers of sizes S00 and S0
3RV29 17-1.



	S00	S0
a	104	125

3-phase busbars for system expansion
for 2 and 3 circuit-breakers of sizes S00 and S0
3RV29 17-4.



	S00	S0
a	104	125



• Revised •
04/20/15

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IEC Power Control

Contactors and Contactor Assemblies

1

2

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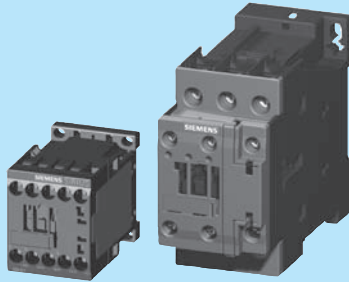
Dimensions

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Contactors for switching three-phase motors

Contactors for switching three-phase motors



3RT10 / 3RT20 Contactors, 3-pole 3 to 75 HP Sizes S00 to S3

with screw, spring or ring lug
connections

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3RT10 contactors, 3-pole, 100 to 400 HP, sizes S6, S10 and S12

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3RT10 / 3RT20 NEMA Labeled Contactors, NEMA size 0 to 6

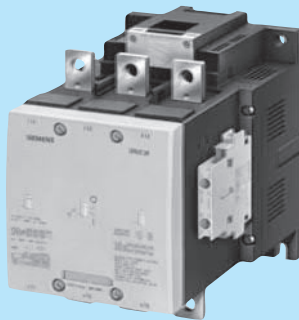
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Contactor assemblies for switching three-phase motors



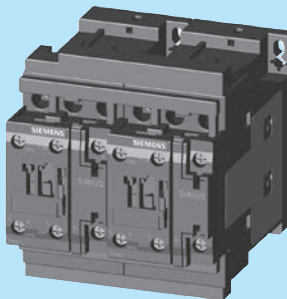
3RT12 vacuum contactors, 3-pole, 150 to 400 HP, sizes S10 and S12

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3RA13 / 23 contactor assemblies for reversing, 3 to 75 HP, sizes S00 to S3

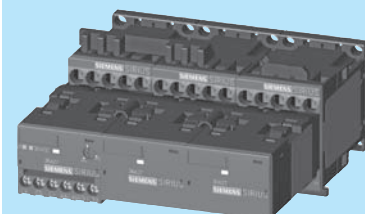
with screw or spring loaded
connections

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Contactors for special applications



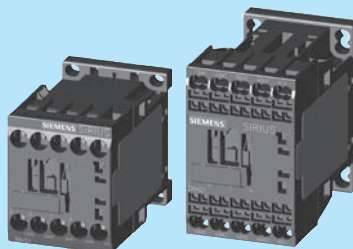
3RT14 contactors,
 I_e /AC-1: 140 to 690 A,
 3-pole, sizes S3 to S12,
 with screw connections

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3RT13 / 23 contactors, AC-1: 18 to 140 A with 4 NO main contacts, sizes S00 to S3

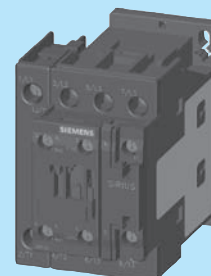
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3RT15 / 25 contactors, AC-3: 7.5-25 HP with 2 NO + 2 NC main contacts, sizes S00 to S2

with screw or spring connections

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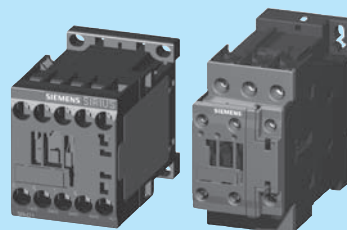
3RT16 / 3RT26 capacitor contactors
 up to 75 kvar
 sizes S00 to S2 with screw connections

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3RT20 coupling relays up to 20 HP (interface,) 3-pole, for switching motors, sizes S00 and S0

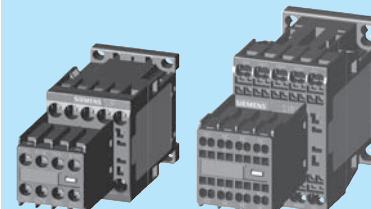
with screw or spring connections

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3RT Safety Contactors and 3RH Safety Control Relays

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IEC Power Control

Contactors and Contactor Assemblies

Contactors for special application

• Revised •
04/20/15



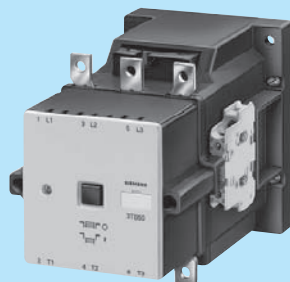
**3TF68 and 3TF69 vacuum contactors,
500 to 700 HP;
contactor assemblies**

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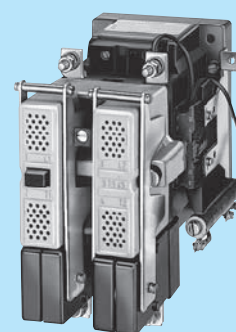


**3TB50 to 3TB56 contactors
with DC solenoid system,
100 to 300 Hp**

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Selection and ordering data

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3TC Contactors

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- Spare parts 2/55

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3RT1 SIRIUS Nomenclature

3RT1	0	3	5	1	A	B0	1
SIRIUS Contactor	Application 0 = 3 pole Standard 2 = 3 pole Vacuum 3 = 4 pole NO 4 = 3 pole resistive load 5 = 4 pole 2 NO + 2 NC 6 = 3 pole Capacitive	Frame 4 = S3 5 = S6 6 = S10 7 = S12	Current Designation Choices = 3,4,5,6	Terminal 1 = Screw 2 = Spring Loaded 3 = Spring Loaded Coil only 6 = Busbar Terminal	Coil Type A = AC (S3) A = AC/DC (S6-S12) B = DC (S3) N = UC Solid state (S6-S12) P = UC Solid state with RLT (S6-S12)	Coil Voltage See Coil Selection Chart page 2/49	Aux Contacts A) 0 = None 1 = 1 NO (S3) 2 = 1 NC (S3) 4 = 2NO + 2NC (S3-S12) 5 = 1NO + 1 NC (S3-S12) 6 = 2 NO + 2 NC (S3-S12) A) per EN50012

3RT2 SIRIUS Innovations Nomenclature

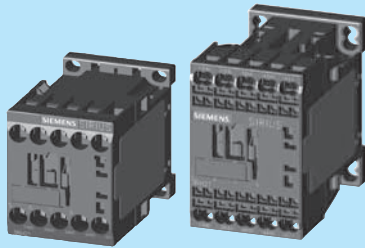
3RT2	0	1	5	1	A	B0	1
SIRIUS Innovations Contactor	Application 0 = 3 pole Standard 3 = 4 pole NO 5 = 4 pole 2 NO + 2 NC 6 = 3-pole Capacitive	Frame 1 = S00 2 = S0 3 = S2	Current 3,4,5,6,7,8	Terminal 1 = Screw 2 = Spring Loaded 4 = Ring Lug	Coil Type A = AC (S00-S0) B = DC N = UC Electronic	Coil Voltage See Coil Selection Chart page 2/49	Aux Contacts A) 0 = 1NO + 1NC (S0-S2) 1 = 1 NO (S00) 2 = 1 NC (S00) 4 = 2NO + 2NC (S00-S2) A) per EN50012

Note: MSPs and Contactors of the same frame size are made to easily fit together with the use of a link module or can be purchased pre-assembled as 3RA starter assemblies. See section 4.

Note: Contactors and Overloads of the frame size S00 - S3 are made to easily fit together without the use of accessories.

Note: This is only a guide to decode the model number. All possible combinations of these are not available.

SIRIUS contactor relays



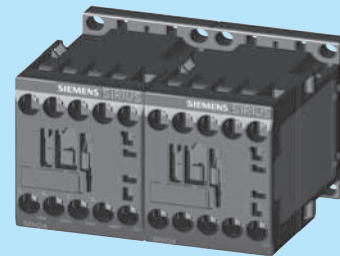
3RH21, 3RH22 control relays 4- and 8-pole, size S00, AC and DC operation

Page

Selection and ordering data

- With screw connections 2/50
- With spring connections 2/50
- Accessories for 3RH2 2/51

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3RH24 latched control relays, 4-pole, size S00, AC and DC operation

Page

Selection and ordering data

- With screw connections 2/51
- Accessories for 3RH2 2/51

Application	2/116
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SIRIUS coupling relays (interface)



3RH21 coupling relays for switching auxiliary circuits, 4-pole, size S00, DC operation

Page

Selection and ordering data

- With screw connections 2/52
- with Cage Clamp connections 2/52

Application	2/52
Technical data	2/189
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Position of terminals	2/203
Dimension drawings	2/224

IEC Power Control

Contactors and Contactor Assemblies

Overview

• Revised •
10/22/15



Type		S00 3RT20 1				S0 3RT20 2						S2 3RT20 3			
3RT10 / 3RT20 contactors															
AC/DC operation		3RT2015	3RT2016	3RT2017	3RT2018	3RT2023	3RT2024	3RT2025	3RT2026	3RT2027	3RT2028	3RT2035	3RT2036	3RT2037	3RT2038
Type		page 2/8				page 2/8						page 2/8			
Maximum 3-phase horsepower ratings at 460V (UL and CSA listed values)															
200 V	HP	1.5	2	3	3	2	3	5	7.5	10	10	10	15	20	20
230 V	HP	2	3	3	5	3	3	5	7.5	10	10	15	15	20	25
460 V	HP	3	5	7.5	10	5	7.5	10	15	20	25	30	40	50	50
575 V	HP	5	7.5	10	10	7.5	10	15	20	25	25	40	50	50	60
AC-3															
I_e /AC-3/400V	A	7	9	12	16	9	12	17	25	32	38	40	50	65	80
230 V	kW	1.5	2.2	3	4	2.2	3	4	5.5	7.5	11	11	15	18.5	22
400 V	kW	3	4	5.5	7.5	4	5.5	7.5	11	15	18.5	18.5	22	30	37
500 V	kW	3.5	4.5	5.5	7.5	4.5	7.5	10	11	18.5	18.5	22	30	37	37
690 V	kW	4	5.5	5.5	7.5	5.5	7.5	11	11	18.5	18.5	22	22	37	45
1000 V	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AC-4 (at $I_a = 6 \times I_e$)															
400 V	kW	3	4	4	5.5	4	5.5	7.5	7.5	11	11	18.5	22	30	37
400 V (200,000 operating cycles)	kW	1.15	2	2	2.5	2	2.6	3.5	4.4	6	6	11.6	12.6	14.7	15.8
AC-1 (40°C, ≤ 690V)															
I_e	A	18	22	22	22	40	40	40	40	50	50	60	70	80	90

Accessories for contactors

Auxiliary switch blocks	front lateral	3RH29 11 3RH29 11	(p. 2/66) (p. 2/68)	3RH29 21 3RH29 21	(p. 2/66) (p. 2/68)		
Terminal covers		—		—		3RT29 36	(p. 2/77)
Box terminals		—		—		—	
Surge suppressor		3RT29 16	(p. 2/73)	3RT29 26	(p. 2/73)	3RT29 36	(p. 2/73)

3RU21 and 3RB3 overload relays (Section 3)

3RU21, thermal, CLASS 10	3RU21 16	0.1-16A (p. 3/10)	3RU21 26	0.18-40A (p. 3/10)	3RU21 36	11-80A (p. 3/10)
3RB30/31, solid-state, CLASS 5, 10, 20 and 30	3RB30 16 3RB31 16	0.1-16A (p. 3/22) (p. 3/23)	3RB30 26 3RB31 26	0.1-40A (p. 3/22) (p. 3/23)	3RB30 36 3RB31 33	12-80A (p. 3/22) (p. 3/23)
3RB22/23, solid-state, CLASS 5, 10, 20 and 30	3RB2.83+ 3RB29 06	0.3-25A (p. 3/34)			3RB22, 3RB23 and 3RB24 with current measuring module	10-100A (p. 3/34)

3RV20 circuit-breakers (Section 1)

Type	3RV20 11	0.18-16A (p. 1/4)	3RV20 21	11-40A (p. 1/4)	3RV20 31	9.5-80A (p. 1/5)
Link modules	3RA29 11	(p. 1/10)	3RA29 21	(p. 1/10)	3RA29 31	(p. 1/10)

3RA23 Reversing contractor assemblies

Complete units	Type	3RA2315	3RA2316	3RA2317	3RA2318	3RA2324	3RA2325	3RA2326	3RA2327	3RA2328	3RA2335	3RA2336	3RA2337	3RA2338
		(page 2/40)				(page 2/42)					(page 2/43)			
460 V	HP	3	5	7.5	10	7.5	10	15	20	25	30	40	50	50
Installation kits / wiring connectors		3RA29 13-2AA1 (p. 2/81)				3RA29 23-2AA1 (p. 2/81)					3RA2933-2AA1 (p. 2/81)			
Mechanical interlocks		3RA29 12-2H (p. 2/82)				3RA29 22-2H (p. 2/82)					3RA2934-2B (p. 2/80)			



S3
3RT1. 4



S6
3RT1. 5



S10
3RT1. 6



S12
3RT1. 7



14
3TF6

	3RT10 44 (p. 2/8)	3RT10 45	3RT10 46	3RT10 54 (p. 2/9)	3RT10 55	3RT10 56	3RT10 64 (p. 2/9)	3RT10 65	3RT10 66	3RT10 75 (p. 2/9)	3RT10 76	–	
	–			–			3RT12 64 (p. 2/10)	3RT12 65	3RT12 66	3RT12 75 (p. 2/10)	3RT12 76	3TF68 (p. 2/53)	3TF69
	20 25 50 60	25 30 60 75	30 30 75 100	40 50 100 125	50 60 125 150	60 75 150 200	60 75 150 200	75 100 200 250	100 125 250 300	125 150 300 400	150 200 400 500	200 250 500 650	290 350 700 860
	65	80	95	115	150	185	225	265	300	400	500	630	820
	30 18.5 37 45 30	37 22 45 55 37	45 22 55 55 37	55 37 75 110 75	75 45 90 132 90	90 55 110 160 90	110 55 160 200 90/315	132 75 160 250 132/355	160 90 200 250 132/400	200 132 250 400 250/560	250 160 355 400/500 250/710	335 200 434 600 600	450 260 600 800 800
	30 15.1	37 17.9	45 22	55 29	75 38	90 45	110 54/78	132 66/93	160 71/112	200 84/140	250 98/161	355 168	400 191
	100	120	120	160	185	215	275/330	330	330	430/610	610	700	910
												– 3TY7 561 (p. 2/53)	
	3RT19 46-4EA1/2 (p. 2/79)			3RT19 56-4EA1/2/3 (p. 2/79)			3RT19 66-4EA1/2/3 (p. 2/79)			3TX7 686/696 (p. 2/54)			
	–			3RT19 55/56-4G (p. 2/79)			3RT19 66-4G (p. 2/79)			–			
3RT19 56-1C (RC element) (p. 2/73)												3TX7 572 (p. 2/54)	
	3RU11 46 18 – 100 A (p. 3/10)			–			–			–		–	
	3RB20 46 12.5 – 100 A (p. 3/22) 3RB21 46 (p. 3/23)			3RB20 56 50 – 200 A (p. 3/22) 3RB21 56 (p. 3/23)			3RB20 66 55 – 630 A (p. 3/22) 3RB21 66 (p. 3/23)			3RB20 66 160 – 630 A (p. 3/22) 3RB21 66		3RB20 66 160 – 630 A (p. 3/22) 3RB21 66	
				3RB2.83 + 20 – 200 A (p. 3/34) 3RB29 56			3RB2.83 + 63 – 630 A (p. 3/34) 3RB29 66						
	3RV10 41 45 – 100 A (p. 1/5)			–			–			–		–	
	3RA19 41 (p. 1/10)			–			–			–		–	
	3RA13 44 3RA13 45 3RA13 46 (p. 2/44)			–			–			–		–	
	50	60	75	100	125	150	150	200	250	300	400	500	700
	3RA19 43-2A (p. 2/81)			3RA19 53-2A (p. 2/81)			3RA19 63-2A (p. 2/81)			3RA19 73-2A (p. 2/81)		3TX7 680-1A	
				3RA19 54-2A (p. 2/80)								3TX7 686-1A	

IEC Power Control

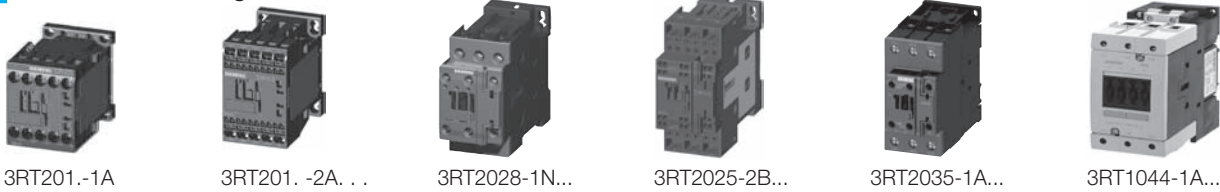
Contactors for Switching Motors

3RT contactors, 3-pole
Size S00 to S3

• Revised •
09/12/16



Selection and ordering data



Frame Size	Amp Ratings	Single-phase HP ratings	Three-phase HP ratings	Auxiliary contacts	Screw Terminals	Spring-Loaded Terminals	Weight approx.
	AC3 AC1	115V 208V 230V	208V 230V 460V 575V	NO NC	Order No.	Order No.	kg
3RT 3-pole contactors							
S00	7	18 0.25 0.5 0.75	1.5 2 3 5	1 0 0 1	3RT2015-1□●●1 3RT2015-1□●●2	3RT2015-2□●●1 3RT2015-2□●●2	0.24/0.29
	9	22 0.33 1 1	2 3 5 7.5	1 0 0 1	3RT2016-1□●●1 3RT2016-1□●●2	3RT2016-2□●●1 3RT2016-2□●●2	
	12	22 0.5 1.5 2	3 3 7.5 10	1 0 0 1	3RT2017-1□●●1 3RT2017-1□●●2	3RT2017-2□●●1 3RT2017-2□●●2	
	16	22 1 2 2	3 5 10 10	1 0 0 1	3RT2018-1□●●1 3RT2018-1□●●2	3RT2018-2□●●1 3RT2018-2□●●2	
S0	9	40 1 1 1	2 3 5 7.5	1 1	3RT2023-1□●●0	3RT2023-2□●●0	0.42/0.60
	12	40 1 2 2	3 3 7.5 10	1 1	3RT2024-1□●●0	3RT2024-2□●●0	
	16	40 1 2 3	5 5 10 15	1 1	3RT2025-1□●●0	3RT2025-2□●●0	
	25	40 2 3 3	7.5 7.5 15 20	1 1	3RT2026-1□●●0	3RT2026-2□●●0	
	32	50 2 5 5	10 10 20 25	1 1	3RT2027-1□●●0	3RT2027-2□●●0	
S2	38	50 3 5 5	10 10 25 25	1 1	3RT2028-1□●●0	3RT2028-2□●●0	0.99/1.121
	40	60 3 5 7.5	10 15 30 40	1 1	3RT2035-1□●●0	3RT2035-3□●●0	
	50	70 3 7.5 10	15 15 40 50	1 1	3RT2036-1□●●0	3RT2036-3□●●0	
	50	80 5 10 10	20 20 50 50	1 1	3RT2037-1□●●0	3RT2037-3□●●0	
S3	60²⁾	90 5 10 15	20 25 50 60	1 1	3RT2038-1□●●0	3RT2038-3□●●0	1.8/2.8
	65	100 5 10 15	20 25 50 60	0 0	3RT1044-1□●●0	3RT1044-3□●●0	
	80	120 7.5 15 15	25 30 60 75	0 0	3RT1045-1□●●0	3RT1045-3□●●0	
	95	120 10 15 20	30 30 75 100	0 0	3RT1046-1□●●0	3RT1046-3□●●0	
Size S2 only: Replace "B" with "K" for 24VDC coil only Size S0 and S2 only: UC Electronic with integrated varistor					□ AC Coil = A DC Coil = B UC Coil = N	□ A B N	

NEMA Size	Amp Ratings	Single-phase HP ratings	Three-phase HP ratings	Auxiliary contacts	Screw Terminals with AC coil	Screw Terminals with 24 VDC coil	Weight approx.
		115V 230V	208V 230V 460V 575V	NO NC	Order No.	Order No.	kg
NEMA Labeled Contactors							
0	18	1 2	3 3 5 5	1 0	3RT2018-1A●●1-0UA0	3RT2018-1BB41-0UA0	0.28
1	27	2 3	7.5 7.5 10 10	1 1	3RT2027-1A●●0-0UA0	3RT2027-1BB40-0UA0	0.42
2	45	3 7.5	10 15 25 25	0 0	3RT2036-1A●●0-0UA0	3RT2036-1NB30-0UA0	0.986/1.121
3	90	7.5 15	25 30 50 50	0 0	3RT1046-1A●●0-0UA0	3RT1046-1BB40-0UA0	1.8 / 2.8

1) All terminals are spring loaded on frame sizes S00 & S0.
Only the coil terminals are spring loaded on frame sizes S2 & S3.

2) Max UL FLA = 60A at 460V

Note: Ring lug terminals are also available in size S00 & S0 contactors, except contactors with communication interface or UC coil. Change the 8th digit of the order number to a "4", e. g. 3RT2015-4AK61.

For further coil voltages, see page 2/49.
For auxiliaries and accessories, see page 2/66-2/83.
For spare parts, see page 2/94-2/99.
For technical data, see page 2/121-2/142.
For description, see page 2/104-2/105.
For int. circuit diagrams, see page 2/190-2/197.
For dimension drawings, see page 2/209-2/212.

AC Coil Selection for 3RT201 through 3RT104

●●Coil Code	C2 ²⁾	H2 ³⁾	K6	P6	U6	V6	T6
60 Hz	24 V	48 V	120 V	240 V	277 V	480 V	600 V
50 Hz	24 V	48 V	110 V	220 V	—	—	—

²⁾ Use Code **B0** for 3RT201, S00

³⁾ Use Code **H0** for 3RT201, S00

DC Coil Selection for 3RT201, 3RT202, 3RT104 (for 3RT203 see UC)

●●Coil Code	A4 ⁴⁾	B4	W4	E4	F4	G4	M4
DC	12 V	24 V	48 V	60 V	110 V	125 V	220 V

⁴⁾ 3RT201 and 3RT202 only

UC Coil Selection for 3RT202

●●Coil Code	B3	F3	P3 ⁴⁾
UC	21-28V	95-130V	200-280V

UC Coil Selection for 3RT203

●●	B3	F3	P3 ⁴⁾
	20-33V	83-155V	175-280V

⁴⁾ at upper limit = 1.1 x U_G

Selection and ordering data

- * AC/DC Coils with built in surge suppressor
- * Coil Types (40Hz to 60Hz, DC):
- * Conventional Coil
- * Solid-state operated coil with wider range and 24 V DC PLC input
- * Solid-state operated coil with Remaining Lifetime Indication (RLT)
- * Box terminals ordered separately



3RT1054-6A . . 6

3RT1065-6P . . 5

Frame Size	Amp Ratings	Single-phase HP ratings	Three-phase HP ratings	Auxiliary contacts	Screw Terminals on coil and aux.	Spring-type terminals on coil and aux. contacts	Weight approx.
	AC3 AC1	115V 230V	200V 230V 460V 575V	NO NC	Order No.	Order No.	kg
3RT 3-pole Contactors							
S6	115 160	— 25	40 50 100 125	2 2	3RT1054-6□●●6	3RT1054-2□●●6	3.5
	150 185	— 30	50 60 125 150	2 2	3RT1055-6□●●6	3RT1055-2□●●6	
	185 215	— 30	60 75 150 200	2 2	3RT1056-6□●●6	3RT1056-2□●●6	
S10	225 275	— —	60 75 150 200	2 2	3RT1064-6□●●6	3RT1064-2□●●6	6.7
	265 330	— —	75 100 200 250	2 2	3RT1065-6□●●6	3RT1065-2□●●6	
	300 330	— —	100 125 250 300	2 2	3RT1066-6□●●6	3RT1066-2□●●6	
S12	400 430	— —	125 150 300 400	2 2	3RT1075-6□●●6	3RT1075-2□●●6	10.5
	500 610	— —	150 200 400 500	2 2	3RT1076-6□●●6	3RT1076-2□●●6	
UC Conventional Coil Solid State Operated Coil = Solid State Operated Coil with RLT =					□ A N P●●5	□ A N —	

NEMA Size	Amp Ratings	Single-phase HP ratings	Three-phase HP ratings	Auxiliary contacts	Screw Terminals on coil and aux.	Spring-type terminals on coil and aux. contacts	Weight approx.
		115V 230V	208V 230V 460V 575V	NO NC	Order No.	Order No.	kg
NEMA Labeled Contactors							
4	135	— 30	40 50 100 100	2 2	3RT1056-6A●●6-0UA0	—	3.5
5	300	— —	100 125 250 300	2 2	3RT1066-6A●●6-0UA0	—	6.7
6	400	— —	150 200 400 500	2 2	3RT1076-6A●●6-0UA0	—	10.5

All coil voltages are in the adjacent table.
For auxiliaries and accessories, see page 2/66-2/83.
For spare parts, see page 2/94-2/99.
For technical data, see page 2/143-2/151.
For description, see page 2/106-2/107.
For int. circuit diagrams, see page 2/196-2/198.
For dimension drawings, see page 2/213-2/214.

Sizes S6 to S12 Coil Codes - UC operation (AC 50 to 60 Hz and DC)

UC Conventional Coil		Solid-State Coil	
Rated control supply voltage Us Us min ... Us max ¹⁾	3RT1. 5.-.A 3RT1. 6.-.A 3RT1. 7.-.A	Rated control supply voltage Us Us min ... Us max ¹⁾	3RT1. 5.-.N 3RT1. 5.-.P 3RT1. 6.-.N 3RT1. 6.-.P 3RT1. 7.-.N 3RT1. 7.-.P
Coil Codes	●●	Coil Codes	●● ●●
23 ... 26 V AC/DC	B3	21 ... 27.3 V AC/DC	B3 —
42 ... 48 V AC/DC	D3	96 ... 127 V AC/DC	F3 F3
110 ... 127 V AC/DC	F3	200 ... 277 V AC/DC	P3 P3
200 ... 220 V AC/DC	M3		
220 ... 240 V AC/DC	P3		
240 ... 277 V AC/DC	U3		
380 ... 420 V AC/DC	V3		
440 ... 480 V AC/DC	R3		
500 ... 550 V AC/DC	S3		
575 ... 600 V AC/DC	T3		

1) Operating range:
0.8 x Us min to 1.1 x Us max.

Contactors and Contactor Assemblies

Contactors for Switching Motors



3RT12 vacuum contactors, 3-pole

Selection and ordering data

- **AC/DC operation** (40 Hz ... 60 Hz, DC)
- **Withdrawable coils**
- **Integrated coil circuit** (varistor)
- **Auxiliary and control conductors: screw connections**
- **Main conductor: bar connections**



Size	Horsepower ratings and utilization categories					Auxiliary contacts, lateral		Rated control supply voltage U_s		Order No.	Weight approx.
	AC-3 Maximum inductive current	Ratings of three-phase motors			AC-1 Maximum resistive current						
	Amps	HP	HP	HP	HP	Amps	NO	NC	AC/DC V	kg	
Conventional operating mechanism											
S10	225	60	75	150	200	330	2	2	110 ... 127 220 ... 240	3RT12 64-6AF36 3RT12 64-6AP36	6.4
	265	75	100	200	250	330	2	2	110 ... 127 220 ... 240	3RT12 65-6AF36 3RT12 65-6AP36	
	300	100	125	250	300	330	2	2	110 ... 127 220 ... 240	3RT12 66-6AF36 3RT12 66-6AP36	
S12	400	125	150	300	400	610	2	2	110 ... 127 220 ... 240	3RT12 75-6AF36 3RT12 75-6AP36	9.6
	500	150	200	400	500	610	2	2	110 ... 127 220 ... 240	3RT12 76-6AF36 3RT12 76-6AP36	
Solid-state operating mechanism · for DC 24 V PLC output											
S10	225	60	75	150	200	330	2	2	96 ... 127 200 ... 277	3RT12 64-6NF36 3RT12 64-6NP36	6.4
	265	75	100	200	250	330	2	2	96 ... 127 200 ... 277	3RT12 65-6NF36 3RT12 65-6NP36	
	300	100	125	250	300	330	2	2	96 ... 127 200 ... 277	3RT12 66-6NF36 3RT12 66-6NP36	
S12	400	125	150	300	400	610	2	2	96 ... 127 200 ... 277	3RT12 75-6NF36 3RT12 75-6NP36	9.6
	500	150	200	400	500	610	2	2	96 ... 127 200 ... 277	3RT12 76-6NF36 3RT12 76-6NP36	

Universal Coil Selection for 3RT126 through 3RT127: Conventional Operation

Coil Code	B3	D3	F3	M3	P3	U3	V3	R3	S3	T3
Volts AC/DC 40 - 60 Hz, DC	23 .. 26 V	42 .. 48 V	110 .. 127 V	200 .. 220 V	220 .. 240 V	240 .. 277 V	380 .. 420 V	440 .. 480 V	500 .. 550 V	575 .. 600 V

Solid State Selection for 3RT126 through 3RT127: Solid-State

Coil Code	B3	F3	P3
Volts AC/DC 40 - 60 Hz, DC	21 .. 27.3 V	96 .. 127 V	200 .. 277 V

For further vacuum contactors, 500Hp and 700Hp (3TF68/69), see page 2/53.
 For auxiliaries and accessories, see page 2/68.
 For spare parts, see page 2/98-2/99.
 For technical data, see page 2/152-2/157.
 For int. circuit diagrams, see page 2/196.
 For dimension drawings, see page 2/215.



• Revised •
04/20/15

Contactors and Contactor Assemblies

Contactors for Special Applications

3RT13 & 3RT23 contactors, 4-pole (4 NO contacts) for switching resistive loads (AC-1)

1
2

Standards

IEC 60947-1, EN 60947-1
IEC 60947-4-1, EN 60947-4-1
IEC 60947-5-1, EN 60947-5-1 (auxiliary switches)

Design

The contactors are suitable for use in any climate. They are safe from touch to DIN VDE 0106, Part 100. The accessories for the 3-pole SIRIUS contactors can also be used for the 4-pole designs.

Mountable auxiliary contacts

Size S00: 4 auxiliary contacts of which up to 3 can be NC.
Size S0 & S2: 4 additional auxiliary contacts up to 3 can be NC.
Sizes S2 and S3: Up to 4 auxiliary contacts (either laterally mounted or snapped onto the top).

Contactor assemblies with mechanical interlock

The 4-pole 3RT13 / 3RT23 contactors with 4 NO contacts as the main contacts are suitable for making contactor assemblies with a mechanical interlock, e.g. for system transfers.

Size S00: Contactor assemblies can be made using two 3RT231 contactors in conjunction with the mechanical interlock and two connecting clips (Order No. 3RA2912-2H, pack comprising 10 interlocking elements and 20 clips for 10 contactor assemblies, see accessories on page 2/72).

Size S0: In order to make 4-pole contactor assemblies using two 3RT232 contactors, the fourth pole of the left-hand contactor must always be moved to the left-hand side. The contactor assembly can then be made easily with the aid of the 3RA2922-2H mechanical interlock and connecting clip set fitted between the two contactors.

Sizes S2 and S3: Contactor assemblies can be made using two 3RT23 3 or 3RT13 4 contactors in conjunction with the laterally mountable mechanical interlock and the mechanical connectors. The mechanical interlock for fitting onto the front cannot be used for size S2 and S3 contactors.

Application

- Switching resistive loads
- Isolating systems with unearthed or poorly earthed neutral conductors
- System transfers when alternative AC power supplies are used
- As contactors which only carry current and do not have to switch in case of inductive loads – e.g. variable-speed operating mechanisms
- Switching mixed loads in distribution systems (e.g. for supplying heaters, lamps, motors, PC power supply units) with p.f. > 0.8 according to IEC 60947-4-1, test conditions for utilization category AC-1

Selection and ordering data

Rating data		Auxiliary contacts		Rated control supply voltage U_s 50/60 Hz	AC Operation Screw Terminals ¹⁾ Order No.	Rated control supply voltage U_s V DC	DC Operation Screw Terminals ¹⁾ Order No.
AC-1 Max resist. current I_e	UL ratings AC loads at 600 V, 60 Hz Amps	Ident- ification No.	Version NO NC				
40°C 60°C Amps				V AC		V DC	

For screwing and stepping onto 35 mm mounting rail

3RT23 17-1AP60



Size S00 – Auxiliary switches can be retrofitted

18 16	18	—	—	—	24 110/120 220/240	3RT23 16-1AB00 3RT23 16-1AK60 3RT23 16-1AP60	24 125 220	3RT23 16-1BB40 3RT23 16-1BG40 3RT23 16-1BM40
22 20	20	—	—	—	24 110/120 220/240	3RT23 17-1AB00 3RT23 17-1AK60 3RT23 17-1AP60	24 125 220	3RT23 17-1BB40 3RT23 17-1BG40 3RT23 17-1BM40

Size S0 – Terminal designations according to EN 50012 —1 NO + 1 NC, identification number 11E

35 ²⁾ 30 ²⁾	30	11E	1	1	24 110/120 220/240	3RT23 25-1AC20 3RT23 25-1AK60 3RT23 25-1AP60	24 125 220	3RT23 25-1BB40 3RT23 25-1BG40 3RT23 25-1BM40
40 ²⁾ 35 ²⁾	35	11E	1	1	24 110/120 220/240	3RT23 26-1AC20 3RT23 26-1AK60 3RT23 26-1AP60	24 125 220	3RT23 26-1BB40 3RT23 26-1BG40 3RT23 26-1BM40
50 ²⁾ 42 ²⁾	38	11E	1	1	24 110/120 220/240	3RT23 27-1AC20 3RT23 27-1AK60 3RT23 27-1AP60	24 125 220	3RT23 27-1BB40 3RT23 27-1BG40 3RT23 27-1BM40

Size S2

60 55	60	11E	1	1	24 110/120 220/240	3RT23 36-1AC20 3RT23 36-1AK60 3RT23 36-1AP60	20-33 83-155 175-280	3RT23 36-1NB30 3RT23 36-1NF30 3RT23 36-1NP30
110 95	105	11E	1	1	24 110/120 220/240	3RT23 37-1AC20 3RT23 37-1AK60 3RT23 37-1AP60	20-33 83-155 175-280	3RT23 37-1NB30 3RT23 37-1NF30 3RT23 37-1NP30

Size S3

140 120	110	—	—	—	24 110/120 220/240	3RT13 46-1AC20 3RT13 46-1AK60 3RT13 46-1AP60	24 125 220	3RT13 46-1BB40 3RT13 46-1BG40 3RT13 46-1BM40
---------	-----	---	---	---	--------------------------	--	------------------	--

1) Size S00 and S0 contactors are also available with spring-type terminals. Replace the 8th digit of the order no. with a "2" e.g. "3RT23 16-2AK60"

2) Minimum conductor cross-section 8 AWG.

For further voltages, see page 2/49.
For coil voltage tolerance, p. 2/49
For auxiliaries and accessories,
see page 2/66-2/83.
For spare parts, see page 2/94-2/99.

For technical data, see page 2/166-2/167.
For in. circuit diagrams, see page 2/191-2/196.
For dimension drawings, see page 2/216.

Contactors and Contactor Assemblies

Contactors for Special Applications

SIRIUS



3RT14, 3-pole for switching resistive loads (AC-1)

Application

AC and DC operation
(size S3)
UC operation (AC/DC)
(sizes S6 to S12)

IEC 60 947, EN 60 947
(VDE 0660)

The contactors are suitable for use in any climate. They are safe from touch to DIN VDE 0106 Part 100.

3RT14 contactors are used for switching resistive loads.

(AC-1) or as contactors, for example in variable-speed drives which normally only have to carry the current.

The accessories for the SIRIUS 3RT10 contactors can also be used here.

Selection and ordering data

3RT14 46-1A...0



Ratings AC-1 utilization category,					UL Ratings				Rated control supply voltage U_s	Order No.	Weight approx.
IEC Ratings											
Maximum current	Rated power of three phase loads $\cos \varnothing = 0.95$ (@ 60°C)				Max Current	230/ 240V	460/ 480V	575/ 600V			
Amps	230V kW	400V kW	500V kW	690V kW	Amps	Hp	Hp	Hp			kg

With screw connections · for screwing and snapping onto 35 mm and 75 mm standard mounting rails

Size S3 · (without auxiliary contacts)

• AC operation

140	50	86	107	148	140	15	30	40	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	3RT14 46-1AC2 0 3RT14 46-1AK6 0 3RT14 46-1AP6 0	1.8
-----	----	----	-----	-----	-----	----	----	----	--	---	-----

• DC operation · DC solenoid system

140	50	86	107	148	131	15	30	40	DC 24 V DC 48 V	3RT14 46-1BB4 0 3RT14 46-1BW40	2.7
-----	----	----	-----	-----	-----	----	----	----	--------------------	-----------------------------------	-----

• AC/DC operation (40 Hz ... 60 Hz, DC)
• Withdrawable coils

• Integrated coil circuit (varistor)

• Auxiliary and control conductors: screw connections

• Main conductor: bar connections

3RT14 6.



Size	Ratings AC-1 utilization category,				UL Rating	Auxiliary contacts, lateral		Rated control supply voltage U_s	Order No.	Weight approx.
	IEC Ratings				Max Current					
	AC-1 Maximum resistive current Amps	Rated power of three phase loads $\cos \varnothing = 0.95$ (@ 60°C)								
	230V kW	400V kW	500V kW	690V kW	Amps	NO	NC	AC/DC V		kg

Conventional operating mechanism

S6	275	95	165	205	285	210	2	2	110 ... 127 220 ... 240	3RT14 56-6AF36 3RT14 56-6AP36	3.1
S10	400	145	250	315	430	360	2	2	110 ... 127 220 ... 240	3RT14 66-6AF36 3RT14 66-6AP36	5.7
S12	690	245	430	535	740	580	2	2	110 ... 127 220 ... 240	3RT14 76-6AF36 3RT14 76-6AP36	9.1

Solid-state operating mechanism · for DC 24 V PLC output

S6	275	95	165	205	285	210	2	2	96 ... 127 200 ... 227	3RT14 56-6NF36 3RT14 56-6NP36	3.1
S10	400	145	250	315	430	360	2	2	96 ... 127 200 ... 277	3RT14 66-6NF36 3RT14 66-6NP36	5.7
S12	690	245	430	535	740	580	2	2	96 ... 127 200 ... 277	3RT14 76-6NF36 3RT14 76-6NP36	9.1

Solid-state operating mechanism · for DC 24 V PLC with remaining lifetime indication

S6	275	95	165	205	285	210	1	1	96 ... 127 200 ... 277	3RT14 56-6PF35 3RT14 56-6PP35	3.1
S10	400	145	250	315	430	360	1	1	200 ... 277	3RT14 66-6PP35	5.7
S12	690	245	430	535	740	580	1	1	200 ... 277	3RT14 76-6PP35	9.1

Universal Coil Selection for 3RT145 through 3RT147: Conventional Operation

Coil Code	B3	D3	F3	M3	P3	U3	V3	R3	S3	T3
Volts AC/DC 40 - 60 Hz, DC	23 ... 26 V	42 ... 48 V	110 ... 127 V	200 ... 220 V	220 ... 240 V	240 ... 277 V	380 ... 420 V	440 ... 480 V	500 ... 550 V	575 ... 600 V

Universal Coil Selection for 3RT145 through 3RT147: Solid-State

Coil Code	B3	F3	P3
Volts AC/DC 40 - 60 Hz, DC	21 ... 27.3 V	96 ... 127 V	200 ... 277 V

Note: B3 code not available for Remaining Lifetime Contactors.

For further coil voltages, see page 2/49.
For auxiliaries and accessories, see page 2/66-2/83.
For spare parts, see page 2/94-2/99.
For technical data, see page 2/158-2/165.
For int. circuit diagrams, see page 2/196.
For dimension drawings, see page 2/211, 2/213-2/214.

AC and DC operation

IEC 60 947-4-1/EN 60 947-4-1
(VDE 0660, Part 102)

Design

The contactors are suitable for use in any climate. They are safe to touch according to EN 50274. The accessories for the 3-pole SIRIUS contactors can also be used for the 4-pole designs.

Mountable auxiliary contacts

Size S00 and S0:

4 auxiliary contacts, of which up to 4 can be NC contacts.

Size S2

Up to 4 auxiliary contacts (either laterally mounted or snapped onto the top; auxiliary switch blocks to EN 50 012 and EN 50 005)

Application

- Changing the polarity of hoisting gear motors
- Switching two separate loads from the same source

Selection and ordering data

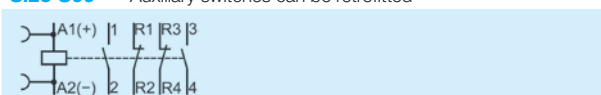
Rating data				Auxiliary contacts Version		Rated control supply voltage U_s	AC Operation ²⁾ Screw terminals Order No.	Rated control supply voltage U_s	DC Operation ²⁾ Screw terminals Order No.	
AC-2/AC-3 T_U : up to 60°C			AC-1 Max resistive current							
Max Current I_e at 400 V	Max motor HP at 460 V, 60 Hz									
			40°C	60°C						
Amps	NO	NC	Amps		NO	NC	V AC, 50/60 Hz		V DC	

For screwing and snapping onto 35 mm standard mounting rail

3RT25 16-1AB00

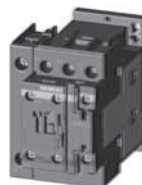


Size S00 ³⁾ - Auxiliary switches can be retrofitted

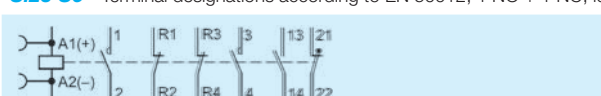


9	5	18	16	—	—	24	3RT25 16-1AB00	24	3RT25 16-1BB40
						110/120	3RT25 16-1AK60	125	3RT25 16-1BG40
						220/240	3RT25 16-1AP60	220	3RT25 16-1BM40
12	7.5 ⁴⁾	22	20	—	—	24	3RT25 17-1AB00	24	3RT25 17-1BB40
						110/120	3RT25 17-1AK60	125	3RT25 17-1BG40
						220/240	3RT25 17-1AP60	220	3RT25 17-1BM40
16	10 ⁴⁾	22	20	—	—	24	3RT25 18-1AB00	24	3RT25 18-1BB40
						110/120	3RT25 18-1AK60	125	3RT25 18-1BG40
						220/240	3RT25 18-1AP60	220	3RT25 18-1BM40

3RT25 26-1AC20



Size S0 - Terminal designations according to EN 50012, 1 NO + 1 NC, identification number 11E

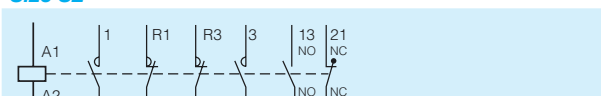


25	15	15	40	35	1	1	24	3RT25 26-1AC20	24	3RT25 26-1BB40
							110/120	3RT25 26-1AK60	125	3RT25 26-1BG40
							220/240	3RT25 26-1AP60	220	3RT25 26-1BM40

3RT25 35-1AC20



Size S2



35	30	20	60	55	1	1	24	3RT25 35-1AC20	V UC	3RT25 35-1NB30
							110/120	3RT25 35-1AK60		3RT25 35-1NF30
							220/240	3RT25 35-1AP60		3RT25 35-1NP30
41	30	25	70	60	1	1	24	3RT25 36-1AC20	20-33	3RT25 36-1NB30
							110/120	3RT25 36-1AK60	83-155	3RT25 36-1NF30
							220/240	3RT25 36-1AP60	175-280	3RT25 36-1NP30

For further voltages, see page 2/49.

For auxiliaries and accessories, see page 2/66-2/83.

For spare parts, see page 2/94-2/99.

For technical data, see page 2/168-2/169.

For int. circuit diagrams, see page 2/191-2/196.

For dimension drawings, see page 2/216.

1) For changing polarity; not suitable for reversing.

2) Size S00 and S0 contactors are also available with spring-type terminals. Replace the 8th digit of the order no. with a "2" e.g. "3RT25 16-2AK60"

3) Size S00:

Coil voltage tolerance
at 50 Hz: 0.8 ... 1.1 x U_s
at 60 Hz: 0.85 ... 1.1 x U_s

4) The NC contact can switch up to 5 HP.

Contactors and Contactor Assemblies

3RT, 3RH Contactors for Special Applications

SIRIUS



3RH21 contactor relays

Overview

DC operation

IEC 60947-4-1, EN 60947-4-1, for requirements according to IEC 60077-1 and IEC 60077-2.

The contactor relays are finger-safe according to EN 50274. The size S00 contactor relays have spring-type connections for all terminals.

Ambient temperature

The permissible ambient temperature for operation of the contactor relays (across the full coil operating range) is -40 to +70 °C.

Uninterrupted duty at temperatures > +60 °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

Control and auxiliary circuits

The solenoid coils of the contactor relays have an extended coil operating range from 0.7 to $1.25 \times U_s$ and are fitted as standard with suppressor diodes to provide protection against overvoltage. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e. g. railway applications under extreme climatic conditions, rolling mills, etc.

Also for control supply voltages with battery buffer for longer operating times should the battery charging fail.

Contactor relays without series resistor

Control and auxiliary circuits

These contactor relays have an extended operating range from 0.7 to $1.25 \times U_s$; the solenoid coils are fitted with a suppressor diode. An additional series resistor is not required.

Note:

An additional auxiliary switch block cannot be mounted.

Side-by-side mounting

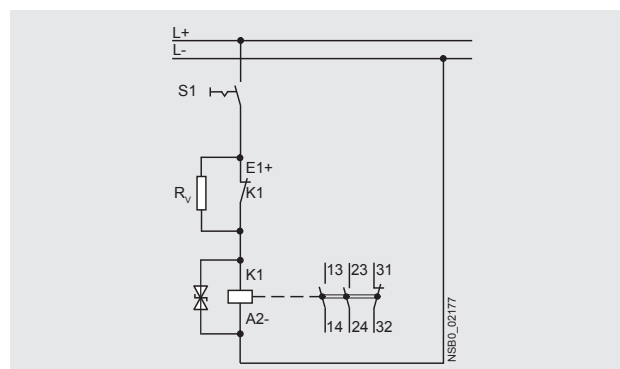
A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C ≤ 70 °C.

Contactor relays with series resistor

Control and auxiliary circuits

The DC solenoid systems of the contactor relays are modified (to hold-in coil) by means of a series resistor.

The size S00 contactor relays are supplied prewired with a plug-on module containing the series resistor. The suppressor diode is integrated.



A 4-pole auxiliary switch block (according to EN 50005) can be fitted additionally.

Side-by-side mounting

Side-by-side mounting is permitted at ambient temperatures up to 70 °C.



Selection and ordering data

DC operation · DC solenoid system

Spring-type terminals

For screw and snap-on mounting onto standard mounting rail




Solenoid coil fitted with suppressor diode



3RH21 22-2K.40



3RH21 22-2K.40-0LA0

Rated operational current I_e /AC-15/AC-14 I_{th} : 70 °C at				Contacts		Rated control supply voltage U_s	Spring-type terminals 	Weight approx.
230 V	400 V	500 V	690 V	Version				
A	A	A	A			V DC	Order No.	kg

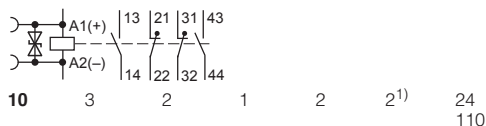
3RH21 contactor relays

Size S00

Without series resistor

Terminal designations according to EN 50011

2 NO + 2 NC, identification number **22E**



3RH21 22-2KB40
3RH21 22-2KF40

0.300
0.300

With series resistor

Terminal designations according to EN 50005

2 NO + 1 NC, identification number **21E**



3RH21 22-2KB40-0LA0
3RH21 22-2KF40-0LA0

0.300
0.300

¹⁾ It is not possible to mount an auxiliary switch block.

²⁾ 4-pole auxiliary switch block according to EN 50005 can be mounted.

More information

Contactors	Type	3RH21 ..
Upright mounting position		
• Contactors with series resistor		Special version (on request)
• Contactors without series resistor		Special version (on request)
Ambient temperature		
• During operation	°C	-40 ... +70
• During storage	°C	-55 ... +80
Solenoid coil operating range		DC
		0.7 ... 1.25 x U_s
Power consumption of the solenoid coils		For cold coil and 1.0 x U_s
• Contactors with series resistor	- Closing	W
	- Closed	W
• Contactors without series resistor	- Closing	W
	- Closed	W

All specifications and technical specifications not mentioned here are identical to those of the standard contactor relays.

Contactors and Contactor Assemblies

3RT, 3RH Contactors for Special Applications

SIRIUS

3RT20 motor contactors, 7.5 ... 25 HP

Overview

DC operation

IEC 60947-4-1, EN 60947-4-1, for requirements according to IEC 60077-1 and IEC 60077-2.

The contactors are finger-safe according to EN 50274. The contactors have spring-type connections as well as screw connections. The size S00 and S0 contactors have spring-type connections for all terminals.

Ambient temperature

The permissible ambient temperature for operation of the contactors (across the full coil operating range) is -40 to +70 °C.

Uninterrupted duty at temperatures > +60 °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

Control and auxiliary circuits

The solenoid coils of the contactor relays have an extended coil operating range from 0.7 to 1.25 or 1.3 x U_s and are fitted as standard with suppressor diodes. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e. g. railway applications under extreme climatic conditions, rolling mills, etc.

Also for control supply voltages with battery buffer for longer operating times should the battery charging fail.

Contactors without series resistor

Control and auxiliary circuits

These contactors have an extended operating range from 0.7 to 1.25 x U_s ; on size S00 the coils are fitted with suppressor diodes, on size S0 with varistors. An additional series resistor is not required.

Note:

An additional auxiliary switch block cannot be mounted.

Side-by-side mounting

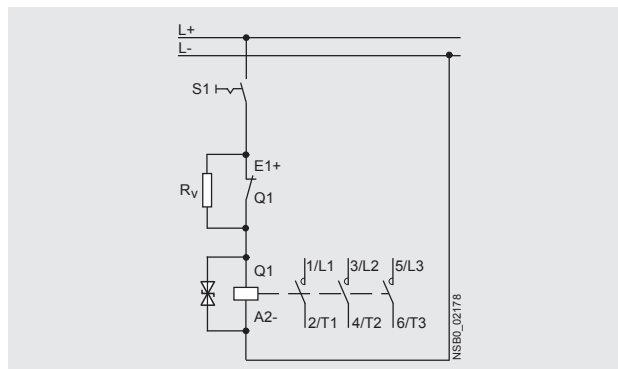
A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C ≤ 70 °C.

3RT20 1. contactors with series resistor

Control and auxiliary circuits

The solenoid coils of the contactors have an extended coil operating range from 0.7 to 1.25 x U_s and are fitted as standard with suppressor diodes to provide protection against overvoltage.

The DC solenoid systems of the contactors are modified (to holding excitation) by means of a series resistor.



The size S00 contactors are supplied prewired with a plug-on module containing the series resistor. The suppressor diode is integrated. A 4-pole auxiliary switch block (according to EN 50005) can be fitted additionally.

A circuit diagram showing the terminals is labeled on each contactor. One NC of the auxiliary contacts is required for the series resistor function. The selection and ordering data shows the number of additional, unassigned auxiliary contacts. With size S00 it is possible to extend the number of auxiliary contacts.

Side-by-side mounting

At ambient temperatures up to 70 °C, the size S00 contactors and contactor relays are allowed to be mounted side by side.

3RT20 2. contactors with solid-state operating mechanism, extended operating range

Control and auxiliary circuits

The solenoid coils of the contactors have an extended coil operating range from 0.7 to 1.3 x U_s and are fitted as standard with varistors to provide protection against overvoltage.

The contactors are energized via upstream control electronics which ensure the coil operating range of 0.7 to 1.3 x U_s at an ambient temperature of 70 °C. They are supplied as complete units with integrated coil electronics. A varistor is integrated for damping opening surges in the coil.

The mounting possibilities for auxiliary switches correspond to those of the standard contactors for switching motors in the matching size (see page 2/58).

Side-by-side mounting

Side-by-side mounting is permitted at ambient temperatures up to 70 °C for these contactor versions in size S0.



Selection and ordering data

DC operation · DC solenoid system

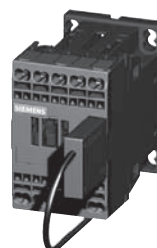
Spring-type terminals

For screw and snap-on mounting onto standard mounting rail

Solenoid coil fitted with suppressor diode (S00)



3RT20 1.-2K.4.



3RT20 1.-2K.42-0LA0

Rated data					Auxiliary contacts		Rated control supply voltage U_s	Spring-type terminals	Weight approx.
AC-3					Ident. No.	Version			
Operational current I_e at									
Ratings of induction motors at									
400 V	200 V	230 V	460 V	575 V					
A	HP	HP	HP	HP					
					NO	NC	V DC		
Order No.									kg

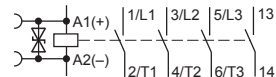
3RT20 contactors for switching motors

Size S00

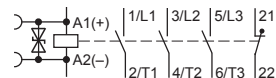
Without series resistor⁴⁾

Terminal designations according to EN 50012 or EN 50005

- 1 NO, identification number **10E**

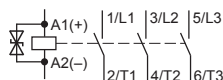


- 1 NC, identification number **01**



12	--	3	7.5	10	10E ¹⁾	1	--	24	3RT20 17-2KB41	0.300
								125	3RT20 17-2KG41	0.300
12	--	3	7.5	10	01 ¹⁾	--	1	24	3RT20 17-2KB42	0.300
								125	3RT20 17-2KG42	0.300

With series resistor



12	--	3	7.5	10	-- ²⁾	--	1 ³⁾	24	3RT20 17-2KB42-0LA0	0.300
								125	3RT20 17-2KG42-0LA0	0.300
16	--	5	10	10	-- ²⁾	--	1 ³⁾	24	3RT20 18-2KB42-0LA0	0.300
								125	3RT20 18-2KG42-0LA0	0.300

For accessories and spare parts, see page 2/66-2/69.

¹⁾ It is not possible to mount an auxiliary switch block. A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C.

²⁾ One 4-pole auxiliary switch block according to EN 50005 can be mounted; no distance required up to 70 °C.

³⁾ NC contact cannot be used because it is required for switching the series resistor.

⁴⁾ Versions available with screw terminals.

Contactors and Contactor Assemblies

3RT, 3RH Contactors for Special Applications



3RT20 motor contactors, 7.5 ... 25 HP

DC operation · DC solenoid system

Spring-type terminals

For screw and snap-on mounting onto standard mounting rail

Solenoid coil fitted with varistor (S0)



3RT20 2.-2K.40



3RT20 2.-2X.40-0LA2

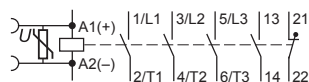
Rated data		Auxiliary contacts		Rated control supply voltage U_s	Spring-type terminals	Weight approx.
AC-3	Operational current I_e at	Ident. No.	Version			
	Ratings of induction motors at					
400 V	200 V 230 V 460 V 575 V					
A	HP HP HP HP					
		NO NC		V DC		kg

3RT20 contactors for switching motors

Size S0

Terminal designations according to EN 50012

1 NO + 1 NC, identification number **11E**



Without series resistor¹⁾

16	--	5	10	15	11E	1	1	24 125	3RT20 25-2KB40 3RT20 25-2KG40	0.600 0.600
25	--	7.5	15	20	11E	1	1	24 125	3RT20 26-2KB40 3RT20 26-2KG40	0.600 0.600
32	--	10	20	25	11E	1	1	24 125	3RT20 27-2KB40 3RT20 27-2KG40	0.600 0.600

With solid-state operating mechanism

16	--	5	10	15	11E	1	1	24 125	3RT20 25-2XB40-0LA2 3RT20 25-2XG40-0LA2	0.580 0.580
25	--	7.5	15	20	11E	1	1	24 125	3RT20 26-2XB40-0LA2 3RT20 26-2XG40-0LA2	0.580 0.580
32	--	10	20	25	11E	1	1	24 125	3RT20 27-2XB40-0LA2 3RT20 27-2XG40-0LA2	0.580 0.580
38	--	10	25	25	11E	1	1	24 125	3RT20 28-2XB40-0LA2 3RT20 28-2XG40-0LA2	0.580 0.580

For accessories and spare parts, see page 2/66-2/69.

¹⁾ It is not possible to mount an auxiliary switch block. A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C.

More information

Contactors	Type		3RT20 17	3RT20 2.	3RT20 2.-2XB40-0LA2	3RT20 2.-2XF40-0LA2
Ambient temperature						
• During operation		°C	-40 ... +70			
• During storage		°C	-55 ... +80			
Solenoid coil operating range	DC		0.7 ... 1.25 x U_s		0.7 ... 1.3 x U_s	
Power consumption of the solenoid coils			For cold coil and 1.0 x U_s			
• Contactors with series resistor	- Closing	W	13	--	--	--
	- Closed	W	4	--	--	--
• Contactors without series resistor	- Closing	W	2.8	4.5	--	--
	- Closed	W	2.8	4.5	--	--
• Contactors with solid-state operating mechanism	- Closing	W	--	--	6.7	13.2
	- Closed	W	--	--	0.8	1.56

All specs and technical specs not mentioned here are identical to those of the standard contactors for switching motors.

AC operation

IEC 60947-5, DIN EN 60947-5-1, (VDE 0660 Part 200)

The contactors are suitable for use in any climate and are finger safe per DIN EN 50274.

The 3RT26 capacitor contactors are application specific variants of the size S00 to S2 SIRIUS Innovations contactors. The capacitors are precharged by means of the mounted leading NO contacts and resistors; only then do the main contacts close.

This prevents disturbances in the power system and welding of the contactors.

Only discharged capacitors are permitted to be switched on with capacitor contactors. Recommendation: use discharge chokes for parallel connection with the capacitors.

The capacitor contactors of size S00 contain either 1NO or 1NC in the basic unit and another unassigned NC contact in the auxiliary switch block fitted to the basic unit.

The auxiliary switch block which is snapped onto the capacitor contactor of sizes S0 contains the three leading NO contacts and one standard NO contact, which is unassigned.

The capacitor contactors of size S2 can be fitted additionally with a 2-pole auxiliary switch on the right side (2 NO, 2 NC or 1 NO + 1 NC), type 3RH19 21-1EA.. for lateral mounting.

For the capacitor making and breaking capacity of the basic 3RT20 contactor variant, see the technical data.

Selection and ordering data

AC operation

AC-6b utilization category For switching three-phase capacitors at an ambient temperature of 60 °C ²⁾	Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
UL capacitor rating at operational voltage 200/208 230/240 460/480 575/600				Order No.	
Phase kvar kvar kvar kvar			AC		kg

For screwing and snapping onto 35 mm standard mounting rail

3RT26 17-1AK63



• Size S00					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	3Ø	4	8.3	10					
1Ø 3.6	3Ø 6.2	4 4	8.3 14	10 17	18	1NO / 1NC	24 V, 50/60 Hz	3RT26 17-1AB03	0.24
							120 V, 60 Hz	3RT26 17-1AK63	
							240 V, 60 Hz	3RT26 17-1AP63	

• Size S0					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	3Ø	4	8.3	10					
1Ø 4.8	3Ø 8.3	4 5.3	8.3 18	10 23	24	1NO / 2NC	24 V, 50/60 Hz	3RT26 25-1AC25	0.49
							120 V, 60 Hz	3RT26 25-1AK65	
							240 V, 60 Hz	3RT26 25-1AP65	

• Size S0					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	3Ø	4	8.3	10					
1Ø 5.8	3Ø 10	4 6.4	8.3 22	10 28	29	1NO / 2NC	24 V, 50/60 Hz	3RT26 26-1AC25	0.49
							120 V, 60 Hz	3RT26 26-1AK65	
							240 V, 60 Hz	3RT26 26-1AP65	

• Size S0					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	3Ø	4	8.3	10					
1Ø 6.6	3Ø 11	4 7.3	8.3 25	10 31	33	1NO / 2NC	24 V, 50/60 Hz	3RT26 27-1AC25	0.49
							120 V, 60 Hz	3RT26 27-1AK65	
							240 V, 60 Hz	3RT26 27-1AP65	

• Size S0					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	3Ø	4	8.3	10					
1Ø 8.6	3Ø 15	4 9.5	8.3 33	10 41	43	1NO / 2NC	24 V, 50/60 Hz	3RT26 28-1AC25	0.59
							120 V, 60 Hz	3RT26 28-1AK65	
							240 V, 60 Hz	3RT26 28-1AP65	

• Size S2					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	3Ø	4	8.3	10					
1Ø 14	3Ø 25	4 16	8.3 55	10 69	72A	2 NC	23-33 VUC	3RT26 36-1NB35	1.11
							83-155 VUC	3RT26 36-1NF35	
							175-280 VUC	3RT26 36-1NP35	

• Size S2					Current	Auxiliary contacts, unassigned	Rated control supply voltage $U_s^{1)3)}$	Screw connection	Weight approx.
1Ø	3Ø	4	8.3	10					
1Ø 20	3Ø 34	4 22	8.3 75	10 94	98A	2 NC	20-33 VUC	3RT26 37-1NB35	1.11
							83-155 VUC	3RT26 37-1NF35	
							175-280 VUC	3RT26 37-1NP35	

1) Coil voltage tolerance: 0.85 ... 1.1 x U_s .

2) A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C

For further voltages, see page 2/49.

For auxiliaries and accessories, see page 2/66-2/83.

For technical data, see page 2/170.

For wiring diagram, see page 2/198.

For dimension drawings, see page 2/217.

DC Coil Selection for 3RT261 only

•• Coil Code	B4	W4	E4	F4	G4	M4
DC	24 V	48 V	60 V	110 V	125 V	220 V

UC Coil Selection for 3RT262

•• Coil Code	NB3	NF3	NP3
UC	21-28V	95-130V	200-280V

UC Coil Selection for 3RT263

•• Coil Code	B3	F3	P3
UC	20-33V	83-155V	175-280V

3) at upper limit = 1.1 x U_s



AC and DC operation

IEC 60947, EN 60947.

The 3RT20 coupling contactors for switching motors are tailored to the special requirements of working with electronic controls.

The 3RT20 1 coupling contactors cannot be expanded with auxiliary switch blocks. Coupling contactors have a low power consumption and an extended solenoid coil operating range.

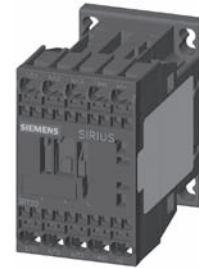
Depending on the version, the solenoid coils are supplied either without overvoltage damping or with a diode, suppressor diode or varistor connected as standard.

Selection and ordering data

DC operation



3RT2015-1HB41



3RT2015-2HB41

Surge suppressor	Ratings Utilization category		Auxiliary contacts		Screw connection	Spring-type connection	Weight approx.
	AC-3		Ident. no.	Design	Order No.	Order No.	(screw/spring)
	Maximum inductive current	Maximum ¹⁾ horsepower ratings at 460 V					
	Amps	HP		NO NC			kg

For screwing and snapping onto 35 mm standard mounting rail

• Size S00

Terminal designations according to EN 50 012

Rated control supply voltage U_s = DC 24 V, coil voltage tolerance **0.7 to 1.25** × U_s

Power consumption of the coils **2.8 W** at 24 V (no auxiliary switch blocks can be mounted)

Diode, varistor or RC element can be mounted	7	3	10E 01	1 –	3RT20 15-1HB41 3RT20 15-1HB42	3RT20 15-2HB41 3RT20 15-2HB42	0.28/0.30
Diode integrated	7	3	10E 01	1 –	3RT20 15-1J B41 3RT20 15-1J B42	3RT20 15-2J B41 3RT20 15-2J B42	0.28/0.30
Suppressor diode integrated	7	3	10E 01	1 –	3RT20 15-1KB41 3RT20 15-1KB42	3RT20 15-2KB41 3RT20 15-2KB42	0.28/0.30
Diode, varistor or RC element can be mounted	9	5	10E 01	1 –	3RT20 16-1HB41 3RT20 16-1HB42	3RT20 16-2HB41 3RT20 16-2HB42	0.28/0.30
Diode integrated	9	5	10E 01	1 –	3RT20 16-1J B41 3RT20 16-1J B42	3RT20 16-2J B41 3RT20 16-2J B42	0.28/0.30
Suppressor diode integrated	9	5	10E 01	1 –	3RT20 16-1KB41 3RT20 16-1KB42	3RT20 16-2KB41 3RT20 16-2KB42	0.28/0.30
Diode, varistor or RC element can be mounted	12	7.5	10E 01	1 –	3RT20 17-1HB41 3RT20 17-1HB42	3RT20 17-2HB41 3RT20 17-2HB42	0.28/0.30
Diode integrated	12	7.5	10E 01	1 –	3RT20 17-1J B41 3RT20 17-1J B42	3RT20 17-2J B41 3RT20 17-2J B42	0.28/0.30
Suppressor diode integrated	12	7.5	10E 01	1 –	3RT20 17-1KB41 3RT20 17-1KB42	3RT20 17-2KB41 3RT20 17-2KB42	0.28/0.30

For technical data, see page 2/171.

For int. circuit diagrams, see page 2/190-2/195.

For dimension drawings, see page 2/209.

1) Complete HP ratings on [page 2/124](#)

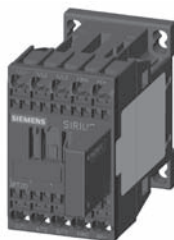


Selection and ordering data

DC operation



3RT2015-1VB41



3RT2015-2VB41



3RT2024-1KB40

Surge suppressor	Ratings Utilization category		Auxiliary contacts		Screw connection	Spring-type connection	Weight approx. (screw/spring) kg
	AC-3		Ident. no.	Design	Order No.	Order No.	
	Maximum inductive current	Maximum horsepower ratings at 460 V					
	Amps	HP		NO NC			

For screwing and snapping onto
35 mm standard mounting rail

• Size S00

Terminal designations according to EN 50 012

Rated control supply voltage U_s = DC 24 V, coil voltage tolerance **0.85 to $1.85 \times U_s$** Power consumption of the coils **1.6 W** at 24 V (no auxiliary switch blocks can be mounted)

Diode, varistor or RC element can be mounted	7	3	10E 01	1 – – 1	3RT20 15-1MB41-0KT0 3RT20 15-1MB42-0KT0	3RT20 15-2MB41-0KT0 3RT20 15-2MB42-0KT0	0.28/0.30
Diode integrated	7	3	10E 01	1 – – 1	3RT20 15-1VB41 3RT20 15-1VB42	3RT20 15-2VB41 3RT20 15-2VB42	0.28/0.30
Suppressor diode integrated	7	3	10E 01	1 – – 1	3RT20 15-1SB41 3RT20 15-1SB42	3RT20 15-2SB41 3RT20 15-2SB42	0.28/0.30
Diode, varistor or RC element can be mounted	9	5	10E 01	1 – – 1	3RT20 16-1MB41-0KT0 3RT20 16-1MB42-0KT0	3RT20 16-2MB41-0KT0 3RT20 16-2MB42-0KT0	0.28/0.30
Diode integrated	9	5	10E 01	1 – – 1	3RT20 16-1VB41 3RT20 16-1VB42	3RT20 16-2VB41 3RT20 16-2VB42	0.28/0.30
Suppressor diode integrated	9	5	10E 01	1 – – 1	3RT20 16-1SB41 3RT20 16-1SB42	3RT20 16-2SB41 3RT20 16-2SB42	0.28/0.30
Diode, varistor or RC element can be mounted	12	7.5	10E 01	1 – – 1	3RT20 17-1MB41-0KT0 3RT20 17-1MB42-0KT0	3RT20 17-2MB41-0KT0 3RT20 17-2MB42-0KT0	0.28/0.30
Diode integrated	12	7.5	10E 01	1 – – 1	3RT20 17-1VB41 3RT20 17-1VB42	3RT20 17-2VB41 3RT20 17-2VB42	0.28/0.30
Suppressor diode integrated	12	7.5	10E 01	1 – – 1	3RT20 17-1SB41 3RT20 17-1SB42	3RT20 17-2SB41 3RT20 17-2SB42	0.28/0.30

• Size S0

Rated control supply voltage U_s = DC 24 V, coil voltage tolerance **0.7 to $1.25 \times U_s$** Power consumption of the coils **4.5 W** at 24 V no auxiliary switch blocks can be mounted.

Varistor integrated	12	7.5	11E	1 1	3RT20 24-1KB40	3RT20 24-2KB40	0.58/0.60
	16	10	11E	1 1	3RT20 25-1KB40	3RT20 25-2KB40	0.58/0.60
	25	15	11E	1 1	3RT20 26-1KB40	3RT20 26-2KB40	0.58/0.60
	32	20	11E	1 1	3RT20 27-1KB40	3RT20 27-2KB40	0.58/0.60

For technical data, see page 2/171.

For int. circuit diagrams, see page 2/190-2/195.

For dimension drawings, see page 2/209.

Contactors and Contactor Assemblies

Contactors & Relays for Safety Applications

**3RT, 3TF safety contactors and
3RH2, 3TH2 safety control relays**

• Revised •
10/22/15

SIRIUS



Applications

“Safety” Contactors

Safety rated contactors are required to have mirrored contact construction according to IEC 60947-4-1 Annex F. A mirror contact is a Normally Closed (NC) auxiliary contact which can not be closed simultaneously with a Normally Open (NO) main contact.

In some industries, such as automotive, requirements have been established that a safety rated contactor must also have permanently mounted auxiliary contact blocks. See page 2/23 for Contactors with permanently mounted auxiliary contacts.

Siemens Contactors for “Safety” applications:

All Siemens standard 3RT, 3TF6, 40HN & 40PH Contactors are provided with positively driven (mirror) contacts which meet or exceed the criteria for “Safety Contactors” according to IEC 60947-4 Annex F which describes the requirements for mirror contact performance.

When applying Safety Contactors in safety circuits, the NC auxiliary contacts must be wired in series or parallel and must be used as monitoring contacts with feedback to the safety evaluation device (i.e. safety relay or failsafe logic controller).

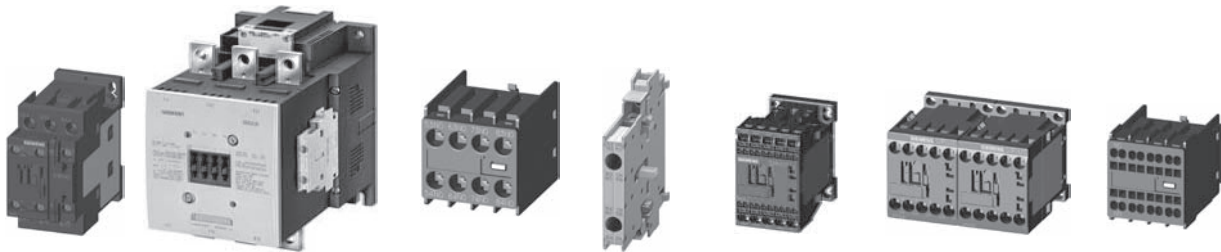
“Safety” Control Relays

Safety rated control relays are required to have positively driven contact elements according to IEC 60947-5-1 Annex L. Positively driven contact elements are a combination of NO auxiliary contacts and NC auxiliary contacts whose construction prevents them from being closed simultaneously.

In some industries, such as automotive, requirements have been established that a safety rated control relays must also have permanently mounted auxiliary contact blocks. See page 2/18 for Control Relays with permanently mounted auxiliary contacts.

Siemens Control Relays for “Safety” applications:

All SIRIUS 3RH control relays (with at least 1 NC contact) meet or exceed the criteria for “Safety Control Relays” according to IEC 60947-5-1 Annex L. This is true for the basic 3RH relay with or without an additional auxiliary contact block.



3RT20 2.-1A..00

3RT10 7.-6A..6

3RH29 21.-1F

3RH19 21.-1DA 11

3RH21

3RH24

3RH2911-2HA..

Frame size	Contactors	Auxiliary contact block
S00	3RT201	3RH2911
	3RT231	
	3RT251	
	3RT261	
S0	3RT202	3RH2921
	3RT232	
	3RT252	
	3RT262	
S2	3RT203	3RH2921
	3RT233	
	3RT253	
	3RT263	
S3	3RT104	3RH1921
	3RT134	
	3RT144	
	3RT164	
S6	3RT105	3RH1921
	3RT145	
S10	3RT106	3RH1921
	3RT126	
	3RT146	
S12	3RT107	3RH1921
	3RT127	
	3RT147	
	3TF6	3TY7561-1UA00

Frame size	Control Relays	Auxiliary contact block
S00	3RH21	3RH2911
	3RH24	
	3TH20	3TX44

For contactors, see pages 2/8-2/9.
For auxiliaries contact blocks, see pages 2/66-2/68.
For control relays, see pages 2/50-2/52.
For auxiliaries contact blocks, see page 2/66-2/68..

Application

"Safety" Contactors

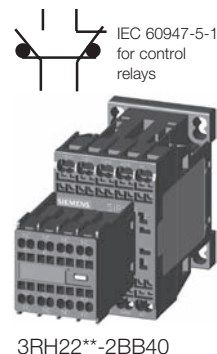
Safety rated contactors are required to have mirrored contact construction according to IEC 60947-4 Annex F. A mirror contact is a Normally Closed (NC) auxiliary contact which can not be closed simultaneously with a Normally Open (NO) main contact. In some industries, such as Automotive, the auxiliary contact blocks are required to be permanently attached to meet the requirements of "unintentional misuse" as specified in IEC 60292, paragraph 3.12. Tested by SUVA.



3RT202* - 1AK64-3MA0

"Safety" Control Relays

Safety rated control relays are required to have positively driven contact elements according to IEC 60947-5-1 Annex L. Positively driven contact elements are a combination of NO auxiliary contacts and NC auxiliary contacts whose construction prevents them from being closed simultaneously. In some industries, such as automotive, the auxiliary contact blocks are required to be permanently attached to meet the requirements of "unintentional misuse" as specified in IEC 60292, paragraph 3.12. Tested by SUVA.



3RH22** - 2BB40

Application

Frame Size	Max. current		Single-phase HP ratings		Three-phase HP ratings				Auxiliary contacts			Screw Terminals Order No.	Spring-Type Terminals ¹⁾ Order No.
	AC3	AC1	115V	220/240V	200V	230V	460V	575V	Ident. No.	NO	NC		
	A	A	HP	HP	HP	HP	HP	HP					
Contactors with permanently mounted auxiliary contact blocks													
S00	7	18	¼	¾	1 ½	2	3	5	22E	2	2	3RT2015-1●●●4-3MA0	3RT2015-2●●●4-3MA0
	9	22	⅓	1	2	3	5	7 ½	22E	2	2	3RT2016-1●●●4-3MA0	3RT2016-2●●●4-3MA0
	12	22	½	2	3	3	7 ½	10	22E	2	2	3RT2017-1●●●4-3MA0	3RT2017-2●●●4-3MA0
	16	22	1	2	3	5	10	10	22E	2	2	3RT2018-1●●●4-3MA0	3RT2018-2●●●4-3MA0
S0	9	40	1	1	2	3	5	7 ½	22E	2	2	3RT2023-1●●●4-3MA0	3RT2023-2●●●4-3MA0
	12	40	1	2	3	3	7 ½	10	22E	2	2	3RT2024-1●●●4-3MA0	3RT2024-2●●●4-3MA0
	16	40	1	3	5	5	10	15	22E	2	2	3RT2025-1●●●4-3MA0	3RT2025-2●●●4-3MA0
	25	40	2	3	7 ½	7 ½	15	20	22E	2	2	3RT2026-1●●●4-3MA0	3RT2026-2●●●4-3MA0
S2	32	50	2	5	10	10	20	25	22E	2	2	3RT2027-1●●●4-3MA0	3RT2027-2●●●4-3MA0
	38	50	3	5	10	10	25	25	22E	2	2	3RT2028-1●●●4-3MA0	3RT2028-2●●●4-3MA0
	40	60	3	7 ½	10	15	30	40	22E	2	2	3RT2035-1●●●4-3MA0	3RT2035-3●●●4-3MA0
	50	70	3	10	15	15	40	50	22E	2	2	3RT2036-1●●●4-3MA0	3RT2036-3●●●4-3MA0
S3	65	80	5	10	20	20	50	50	22E	2	2	3RT2037-1●●●4-3MA0	3RT2037-3●●●4-3MA0
	80 ⁴⁾	90	5	15	20	25	50	60	22E	2	2	3RT2038-1●●●4-3MA0	3RT2038-3●●●4-3MA0
	80	120	7 ½	15	25	30	60	75	22E	2	2	3RT1045-1●●●4-3MA0	3RT1045-3●●●4-3MA0
	95	120	10	20	30	30	75	100	22E	2	2	3RT1046-1●●●4-3MA0	3RT1046-3●●●4-3MA0
S6	150	185	--	30	50	60	125	150	22E	2	2	3RT1055-6●●●6-3PA0	—
	185	215	--	30	60	75	150	200	22E	2	2	3RT1056-6●●●6-3PA0	—
S10	225	275	--	--	60	75	150	200	22E	2	2	3RT1064-6●●●6-3PA0	—
	265	330	--	--	75	100	200	250	22E	2	2	3RT1065-6●●●6-3PA0	—
	300	330	--	--	100	125	250	300	22E	2	2	3RT1066-6●●●6-3PA0	—

Control circuit coil options: Replace ●●● with the desired code

Frame Size S00 - S0	●●●	Frame Size S2	●●●	Frame Size S3	●●●	Frame Size S6 - S10	●●●
120 V AC	AK6	120 V AC	AK6	120 V AC **	AK6	23 ... 26 V UC*, conventional coil	AB3
120 V AC, integrated varistor	CK6	120 V AC w/ Varistor	CK6	24 V DC	BB4	21-27 V UC*, solid state coil	NB3
230 V AC	AP0	24 V DC w/Varistor	KB4	24 V DC w/diode assy	QB4	w/ PLC interface	
24 V DC	BB4					110 ... 127 V UC*, conventional coil	AF3
24 V DC, integrated varistor	DB4						
24 V DC, integrated diode assy.	FB4						

**Available in 3RT1046 only

*UC coil: accepts DC voltage or AC voltage, 40 to 60 Hz.

Frame Size	Max. current at 240 V ²⁾	Rated control supply voltage U _s	Auxiliary contacts			Screw Terminals ³⁾	Spring Terminals ³⁾
A			Ident. No.	NO	NC	Order No.	Order No.
Control relays with permanently mounted auxiliary contact blocks							
S00-S00	10	110 V AC, 50 Hz / 120 V AC, 60 Hz	44E	4	4	3RH2244-1AK60	3RH2244-2AK60
	10	24 V DC	44E	4	4	3RH2244-1BB40	3RH2244-2BB40
	10	110 V AC, 50 Hz / 120 V AC, 60 Hz	62E	6	2	3RH2262-1AK60	3RH2262-2AK60
	10	24 V DC	62E	6	2	3RH2262-1BB40	3RH2262-2BB40

For other voltages see page 2/49.

For accessories, see pages 2/73-2/78.

For spare parts, see pages 2/94-2/97.

For technical data, see pages 2/121-2/142.

For description, see pages 2/104-2/105.

For int. circuit diagrams, see page 2/190-2/196.

For dimension drawings, see pages 2/209-2/215.

1) All terminals are spring loaded on frame size S00 and S0. Only the coil and auxiliary contact terminals are spring loaded on frame sizes S2 & S3.

2) For AC-15/AC-14, max current for front mounted auxiliary contacts = 6 A.

3) The 3RH22 control relays are also available with ring lug terminals. Replace the 8th digit of the order number with a "4", e. g. 3RH2244-4AK60

4) Max UL FLA = 65A at 460V

Contactors and Contactor Assemblies

Function Modules for Mounting onto SIRIUS 3RT2 Contactors







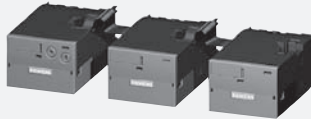


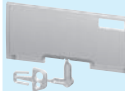


• Revised •
04/20/15



Introduction

Overview

The function modules for mounting onto contactors enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular starter, e. g. timing and interlocking, and can be connected to the control system by either parallel wiring or through IO-Link or AS-Interface.

Version	SIRIUS function modules for parallel wiring	SIRIUS function modules for IO-Link ¹⁾	SIRIUS function modules for AS-Interface ¹⁾
For direct-on-line starting	Timing relays: ON or OFF-delay with semiconductor output With screw or spring-type terminals 	With screw or spring-type terminals 	With screw or spring-type terminals 
For reversing starting	Wiring modules for sizes S00, S0 & S2 With screw or spring-type terminals - (with screw terminals for main and control circuit) 	1 function module for size S00, S0 & S2, screw and spring-type connection, plus the respective wiring modules ¹⁾ 	1 function module for size S00, S0 & S2, screw and spring-type connection, plus the respective wiring modules ¹⁾ 
For wye-delta starting	1 function module for size S00, S0 & S2, screw and spring-type connection of the contactors, plus the respective wiring modules ²⁾ 	For wye-delta starting: 1 function module for size S00, S0 & S2, plus screw and spring-type connection, plus the respective wiring modules ²⁾ 	For wye-delta starting: 1 function module for size S00, S0 & S2, plus screw and spring-type connection, plus the respective wiring modules ²⁾ 
Accessories	Sealable covers 	Operator panel for autonomous controlling of up to 4 starters Module connector for the grouping of starters Connection cable between the operator panel and the starter group Sealable covers 	AS-Interface addressing units Sealable covers 

¹⁾ Use of the communication-capable function modules for IO-Link or AS-Interface requires contactors with communication interface (see pages 2/26).

²⁾ The modules for the control current wiring, which are included in the wiring kit, are not required.

Note:

When the function modules are used, no other auxiliary switches are allowed to be mounted on the basic units.



Overview

Simply by being plugged in place, the SIRIUS function modules enable different functionalities required for the assembly of starters to be realized in the starter. The function modules and wiring kits help to reduce the wiring work within the starter practically to zero.

SIRIUS function modules for direct-on-line starting

The electronic timing relays which can be mounted onto the contactor are available in these versions:

- Sizes S00 and S0 for applications in the range from 24 to 240 V AC/DC (wide voltage range)
- Size S2 for applications in either the range from 24 to 90 V AC/DC or 90 to 240 V AC/DC

Both the electrical and mechanical connection are made by simple snapping on and locking.

A protection circuit (varistor) is integrated in each module.

The electronic timing relay with semiconductor output uses two contact legs to actuate the contactor underneath by means of a semiconductor after the set time t has elapsed.

The switching state feedback is performed by a mechanical switching state indicator (plunger). In addition, the auxiliary switches in the contactors are freely accessible and can be used for feedbacks to the control system or for signal lamps.

A sealable cover is available to protect against careless adjustment of the set times.

SIRIUS function modules for reversing starting

The wiring kits for reversing starters enable the cost-effective assembly of contactor assemblies. They can be used for all applications with reversing duty up to 50 HP.

For a detailed description see page 2/37.

SIRIUS function modules for wye-delta starting

Both interlocking and timing functions are required for the assembly of wye-delta starters. With the function modules for wye-delta starting and the matching link modules for the main circuit, these starters can be assembled easily and with absolutely no errors.

The entire sequence in the control circuit is integrated in the snap-on modules. This covers:

- An adjustable wye time t from 0.5 to 60 s
- A non-adjustable dead interval of 50 ms
- Electrical contacting to the contactors by means of coil pick-off (contact legs)
- Feedback of the switching state at the contactor using a mechanical switch position indicator (plunger)
- Electrical interlocking between the contactors

These modules do not require their own terminals and can therefore be used for contactors with both screw and spring-type terminals in the S00, S0 and S2. To start the wye-delta starter, only the first of the three contactors (line contactor) is actuated. All other functions then take place inside the individual modules.

This also offers advantages if the timing function was previously implemented in a controller, as it again results in a significant reduction in the number of PLC outputs, the programming work and the wiring outlay.

The kits for the main circuit include the mechanical interlock, the star jumper, the wiring modules at the top and at the bottom, and the required connecting clips.

A protection circuit (varistor) is integrated in the basic module.

Application

The snap-on function modules for direct-on-line starting are used above all for realizing timing functions independently of the control system.

With the OFF-delay variant of the timing relay it is possible for example for the fan motor for cooling a main drive to be switched off with a delay so that sufficient cooling after operation is guaranteed even if the plant and its control system have already been switched off.

The ON-delay timing relays enable for example the time-delayed starting of several drives so that the summation starting current does not rise too high, which could result in voltage failure.

The function modules for wye-delta starting are mostly used where current-limiting measures for starting a drive are required, e.g. for large fans and ventilators, and a high level of availability is essential at the same time. This technology has been used with success for several decades and has the additional advantage of requiring relatively little know-how. Through the use of function modules, the assembly work with simple standard components is even easier and error-free.

Benefits

The use of snap-on function modules for direct-on-line starting (timing relays) results in the following advantages:

- Reduction of control current wiring
- Prevention of wiring errors
- Reduction of testing costs
- Implementation of timing functions independently of the control system
- Less space required in the control cabinet compared to a separate timing relay
- No additive protection circuit required (varistor integrated)

The use of function modules for wye-delta starting results in the following advantages:

- Operation solely through the line contactor A1/A2 – no further wiring needed
- Reduction of the control current wiring inside the contactor assembly and to the higher-level control system where applicable
- Prevention of wiring errors
- Reduction of testing costs
- Integrated electrical interlocking saves costs and prevents errors
- Less space needed in the control cabinet compared to using a separate timing relay
- Adjustable starting in star mode from 0.5 to 60 s
- Independent of the contactor's control supply voltage (24 to 240 V AC/DC)
- Varistor integrated – no additive protection circuit required
- No control current wiring thanks to plug-in technology and connecting cables
- Mechanically coded assembly enables easy configuration and reliable wiring
- Fewer versions – one module kit for screw and spring-type connection and for the two sizes S00 to S2
- Mechanical interlocking (with wiring kit for the main circuit)

Contactors and Contactor Assemblies

Contactors for Switching Motors

**3RT2 contactors, 3-pole
Communication Contactors**

• Revised •
04/20/15




SIRIUS



Selection and ordering data

- Ideal for diagnostics to the automation controller
- Quickly locate and rectify faults
- Configuration available in Step 7 and TIA Portal
- Easy engineering of parameters
- For DOL, reversing and wye delta starters up to 50 HP
- Manual starter operation with optional operator panel
- Reduces control wiring in the panel
- Available for 24VDC control systems
- Easily snap on IO-Link or AS-Interface modules onto contactors



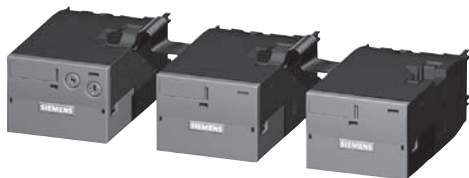
	Frame Size	Amp Ratings		Single-phase HP ratings		Three-phase HP ratings				Auxiliary contacts		Screw Terminals 24 V DC coil Order No.	Spring-type Terminals 1) 24 V DC coil Order No.	Weight approx. kg
		AC3	AC1	115V	230V	208V	230V	460V	575V	NO	NC			
3RT 3-pole Contactors														
 3RT2018-1BB41-0CC0	S00	7	18	0.25	0.75	1.5	2	3	5	1	0	3RT2015-1BB41-0CC0	3RT2015-2BB41-0CC0	0.28
										0	1	3RT2015-1BB42-0CC0	3RT2015-2BB42-0CC0	
		9	22	0.33	1	2	3	5	7.5	1	0	3RT2016-1BB41-0CC0	3RT2016-2BB41-0CC0	
										0	1	3RT2016-1BB42-0CC0	3RT2016-2BB42-0CC0	
		12	22	0.5	2	3	3	7.5	10	1	0	3RT2017-1BB41-0CC0	3RT2017-2BB41-0CC0	
										0	1	3RT2017-1BB42-0CC0	3RT2017-2BB42-0CC0	
		16	22	1	2	3	5	10	10	1	0	3RT2018-1BB41-0CC0	3RT2018-2BB41-0CC0	
										0	1	3RT2018-1BB42-0CC0	3RT2018-2BB42-0CC0	
 3RT2028-1BB40-0CC0	S0	9	40	1	1	2	3	5	7.5	1	1	3RT2023-1BB40-0CC0	3RT2024-2BB40-0CC0	0.58
		12	40	1	2	3	3	7.5	10	1	1	3RT2024-1BB40-0CC0	3RT2024-2BB40-0CC0	
		16	40	1	3	5	5	10	15	1	1	3RT2025-1BB40-0CC0	3RT2025-2BB40-0CC0	
		25	40	2	3	7.5	7.5	15	20	1	1	3RT2026-1BB40-0CC0	3RT2026-2BB40-0CC0	
		32	50	2	5	10	10	20	25	1	1	3RT2027-1BB40-0CC0	3RT2027-2BB40-0CC0	
		38	50	3	5	10	10	25	25	1	1	3RT2028-1BB40-0CC0	3RT2028-2BB40-0CC0	
 3RT2038-1NB30-0CC0	S2	40	60	3	7.5	10	15	30	40	1	1	3RT2035-1NB30-0CC0	3RT2035-3NB30-0CC0	1.122
		50	70	3	10	15	15	40	50	1	1	3RT2036-1NB30-0CC0	3RT2036-3NB30-0CC0	
		65	80	5	10	20	20	50	50	1	1	3RT2037-1NB30-0CC0	3RT2037-3NB30-0CC0	
		80	90	5	15	20	25	50	60	1	1	3RT2038-1NB30-0CC0	3RT2038-3NB30-0CC0	

1) All terminals are spring loaded in sizes S00 and S0.
For size S2, only the coil and aux contacts are spring loaded.

Communication capable contactors are ideal for starter feedback to the automation level.
IO-Link starters in the cabinet save considerable wiring effort. AS-Interface is best suited for distributed systems.

For reversing contactors with communication capability, see pages 2/39-2/43
For accessories, see page 2/27, 2/30, 2/34.
For technical data, see page 2/31, 2/35, 2/36
For description, see page 2/24.
For further information on IO-Link and AS-Interface, see page 2/28-2/29 and 2/32-2/33.

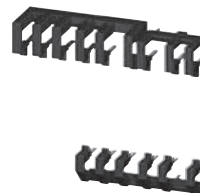
Selection and ordering data



3RA28 16-0EW20



3RA29 13-2AA1



3RA29 13-2BB2

For contactors	Rated control supply voltage U_s ¹⁾	Time setting range t	Screw terminals	Weight approx.	Spring-type ²⁾ terminals	Weight approx.
Type	V	s	Order No.	kg	Order No.	kg

Assembly kits for reversing starting

Assembly kits for making 3-pole contactor assemblies

The assembly kit contains:
Mechanical interlock;
2 connecting clips for 2 contactors,
wiring modules on the top and bottom

3RT20 1.	• For size S00	3RA29 13-2AA1	0.046	3RA29 13-2AA2	0.070
3RT20 2.	• For size S0	3RA29 23-2AA1	0.089	3RA29 23-2AA2	0.112
3RT20 3.	• For size S2 (w/o mechanical interlock, see pg. 2/43)	3RA29 33-2AA1	0.159	3RA29 33-2AA2	0.156

Assembly kits for wye-delta starting

Assembly kits for making 3-pole contactor assemblies

The assembly kit contains:
Mechanical interlock,
4 connecting clips for 3 contactors;
star jumper,
wiring modules on the top and bottom

3RT20 1.	• For size S00	3RA29 13-2BB1	0.051	3RA29 13-2BB2	0.080
3RT20 2.	• For size S0 (only main circuit for version with spring-type terminals)	3RA29 23-2BB1	0.099	3RA29 23-2BB2	0.133
3RT20 3.	• For size S2 (only main circuit for version with spring-type terminals)	3RA29 33-2BB1	0.242	3RA29 33-2BB2	0.182

Function modules for wye-delta starting

The electrical connection between the function module and the contactor assembly is established automatically by snapping on and plugging in the connecting cables.

Wye-delta function (varistor integrated)

3RT20 1.	24 ... 240 AC/DC	0.5 ... 60	3RA28 16-0EW20	0.170	3RA28 16-0EW20	0.170
3RT20 2.		(10, 30, 60				
3RT20 3.		selectable)				

Accessories

Sealable covers

for 3RA27, 3RA28, 3RA29

3RA29 10-0	0.002	3RA29 10-0	0.002
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¹⁾ AC voltage values apply for 50 Hz and 60 Hz.

²⁾ Assembly kits in sizes S0 and S2 are supplied with wiring modules for the main circuit only.

Note:

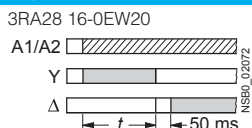
When the function modules are used, no other auxiliary switches are allowed to be mounted on the basic units.

Function	Function charts
	<div> <div></div> Timing relay energized </div> <div> <div></div> Contact closed </div> <div> <div></div> Contact open </div>

2 NO contacts (internally connected)

Wye-delta function
(varistor integrated)

- 1 NO contact, delayed
- 1 NO contact, instantaneous



Contactors and Contactor Assemblies

Function Modules for Mounting onto SIRIUS 3RT2 Contactors

SIRIUS



SIRIUS function modules for IO-Link

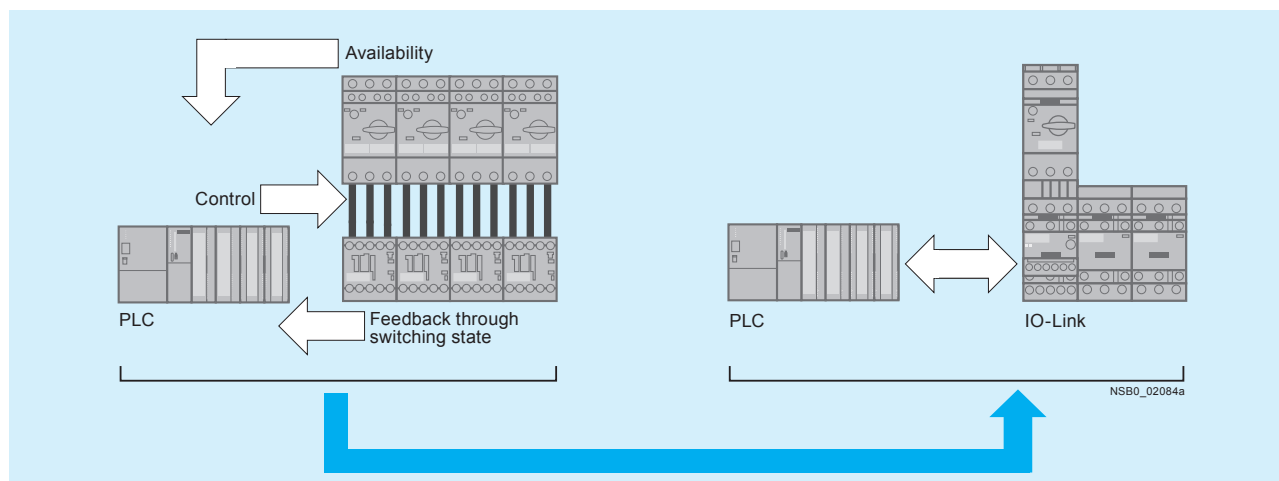
Overview

The SIRIUS function modules for IO-Link enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular starter, e. g. timing and interlocking. The electrical and mechanical connection to the contactor is established by snapping on and locking. An additive protection circuit for the individual contactors can be dispensed with completely, and feedback from the contactor contacts is performed with Hall sensors which provide reliable feedback concerning the switching state even under extremely dusty conditions. The starters are connected to the higher-level

control system through IO-Link, with the possibility of connecting up to four starters as a group to one port of the IO-Link master.

Through this type of connection to the control system, a maximum of wiring is saved. The following essential signals are transmitted:

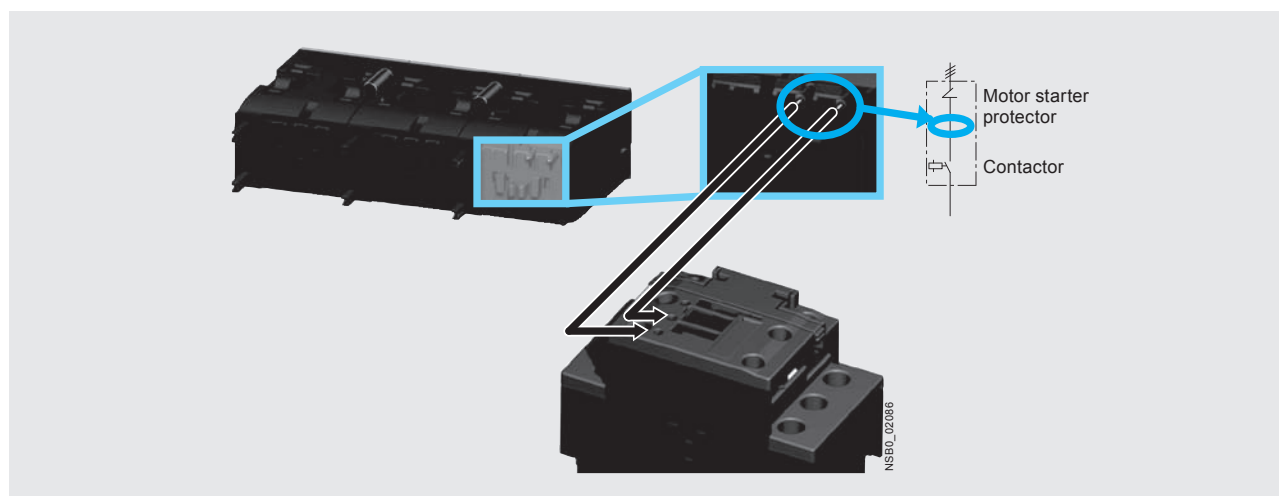
- Availability of the starter in response to an indirect inquiry from the motor starter protector
- Starter operation
- Feedback concerning the switching state of the starter



Signal transmission through IO-Link

The inquiry from the motor starter protector does not take place through additional wiring between the auxiliary switch and the module but by means of a voltage inquiry at the contactor input.

This requires the use of communication versions of the contactors with communication interface (see page 2/26).

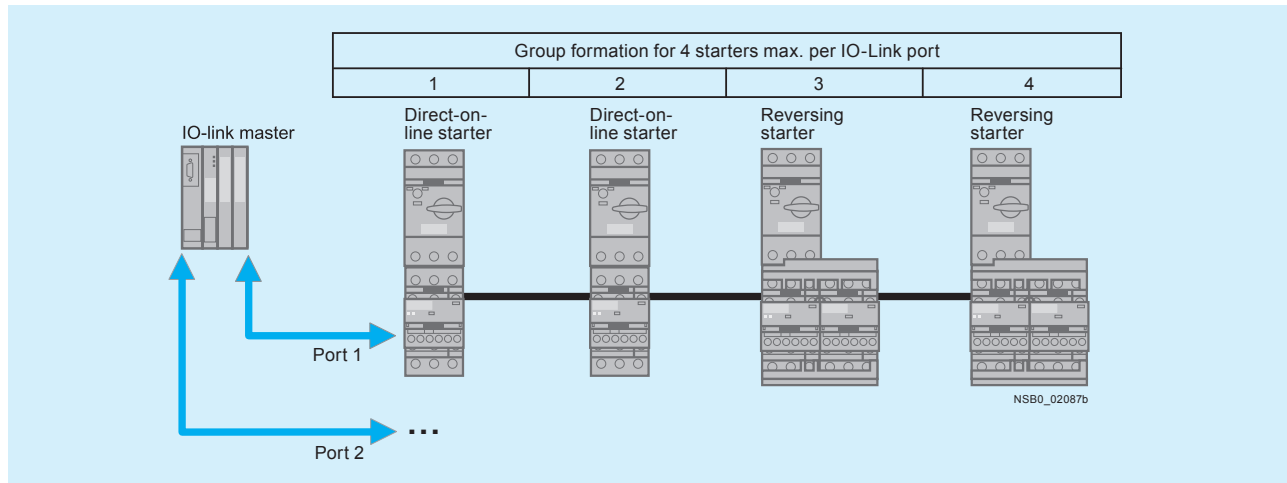


Availability signal through voltage pick-off



By grouping up to four starters it is possible to connect up to 16 starters to one master of the ET200S. All the signals of the individual controls are made available through only 3 individual wires per starter group directly in the process image. If the

potential at the master of the ET200S is the same as that of the controls, a further reduction in wiring is possible by providing the control supply voltage to the contactors by jumpering the corresponding communication wires.



Group formation with IO-Link

In case of a malfunction, the corresponding error signals are also sent directly to the PLC in acyclic mode. This is in addition to transmission of the switching signals and status signals.

Possible error signals:

- Device defect
- No main voltage (motor starter protector tripped)
- No control supply voltage
- Limit position on the right / on the left
- Manual mode
- Process image fault

This easy integration of the starters in the TIA world does not limit the flexibility in the field in the least. For example, all function modules have special terminals in order to enable direct local disconnection. These terminals can be connected for example to a position switch. The input interrupts the voltage supply to the contactor coil directly, i. e. without going through the PLC. These terminals are jumpered in the as-delivered state.

Local manual operation of the complete starter group is also straight-forward using a operator panel. The latter is easily connected to the last starter and can be built into the front panel of the control cabinet if required. This offers significant advantages particularly for commissioning.

Application

The use of SIRIUS function modules with IO-Link is recommended above all in machines and plants in which there are several motor starters in one control cabinet. Using IO-Link, the connection of these starters to the automation level is easy, quick and error-free. And with IO modules no longer needed, the width of the ET200S becomes far smaller.

Benefits

- Reduction of the control current wiring to no more than one cable having three conductors for four starters
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Integration in TIA for clear diagnostics if a fault occurs
- Fewer IO modules saves space in the control cabinet
- All essential timing and interlocking functions for reversing duty and wye-delta starting are integrated
- No additional control circuit required

Further information on the application and benefits of the SIRIUS function modules for connection to the control system through IO-Link can be found in Chapter 14 "Industrial Communication".

Contactors and Contactor Assemblies





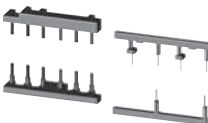


Function Modules for Mounting onto SIRIUS 3RT2 Contactors

SIRIUS function modules for IO-Link

• Revised •
04/20/15





Selection and ordering data

Version		Screw terminals	Spring-type terminals	Weight
		Order No.	Order No.	kg
Function modules for direct-on-line starting				
 3RA2711-1AA00	IO-Link connection Includes one module connector for assembling an IO-Link group	3RA2711-1AA00	3RA2711-2AA00	
 3RA2711-2AA00				
Function modules for reversing starting ¹⁾				
 3RA2711-1BA00	IO-Link connection, comprising one basic and one coupling module and an additional module connector for assembling an IO-Link group	3RA2711-1BA00	3RA2711-2BA00	
 3RA2711-2BA00				
 3RA2923-2AA1	Assembly kits for making 3-pole contactor assemblies The assembly kit contains: mechanical interlock, 2 connecting clips for two contactors, wiring modules on the top and bottom	3RA2913-2AA1	3RA2913-2AA2	
 3RA2923-2AA2	<ul style="list-style-type: none">• For size S00• For size S0<ul style="list-style-type: none">- For main, auxiliary and control circuits- Only for main circuit²⁾	3RA2923-2AA1 --	-- 3RA2923-2AA2	
 3RA2923-2AA2	<ul style="list-style-type: none">• For size S2<ul style="list-style-type: none">- For main, auxiliary and control circuits- Only for main circuit²⁾	3RA2933-2AA1 --	-- 3RA2933-2AA2	

1) For prewired contactor assemblies for reversing starting with voltage tap-off, see pages 2/40 and 2/43. When these contactor assemblies are used, the assembly kit for the wiring is already integrated.

2) Version in sizes S0 and S2 with spring-type terminals:
Only the wiring modules for the main circuit are included.
No connectors are included for the auxiliary and control circuit.

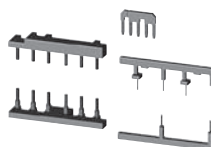
Matching contactors with communications interface required;
see pages 2/26.

Version	Screw terminals 	Spring-type terminals 	Weight
	Order No.	Order No.	kg

Function modules for wye-delta starting¹⁾



3RA2711-1CA00



3RA2923-2BB1



3RA2923-2BB2

IO-Link connection, comprising one basic module and two coupling modules, plus an additional module connector for assembling an IO-Link group

Assembly kits for making 3-pole contactor assemblies²⁾

The assembly kit contains:
mechanical interlock,
4 connecting clips for 3 contactors;
star jumper,
wiring modules on the top and bottom

- For size S00
- For size S0
 - For main, auxiliary and control circuits
 - Only for main circuit³⁾
- For size S2
 - For main, auxiliary and control circuits
 - Only for main circuit³⁾

3RA2711-1CA00

3RA2711-2CA00

3RA2913-2BB1

3RA2913-2BB2

3RA2923-2BB1

--

3RA2923-2BB2

3RA2933-2BB1

--

3RA2933-2BB2

1) For complete contactor assemblies for wye-delta starting including function modules, see pages 2/47 and 2/48.

2) When using the function modules for wye-delta starting, the wiring modules for the auxiliary current are not required.

3) Version in sizes S0 and S2 with spring-type terminals:
Only the wiring modules for the main circuit are included.
No connectors are included for the auxiliary and control circuit.

Matching contactors with communications interface required;
see pages 2/26.

Version	Order No.	Weight kg
---------	-----------	--------------

Accessories



3RA2711-0EE10



3RA2711-0EE06



3RA2711-0EE15



3RA2910-0

Module connector set, comprising:
• 2 module connectors, 14-pole, short
• 2 interface covers

Module connectors

- 14-pole, 9 cm
For size jump + 1 space
- 14-pole, 26 cm
For various space combinations
- 14-pole, 33.5 cm
For various space combinations
- 10-pole, 9 cm
For separate control signal infeed within an IO-Link group

Interface covers
(Set of 5)

Sealable covers
For 3RA27, 3RA28, 3RA29

3RA2711-0EE10

3RA2711-0EE06

3RA2711-0EE07

3RA2711-0EE08

3RA2711-0EE16

3RA2711-0EE15

3RA2910-0

Operator panels¹⁾



3RA6935-0A



3RA2711-0EE11

Operator panel (set), comprising:

- 1 x operator panel
- 1 x enabling module
- 1 x interface cover
- 1 x fixing terminal

Connection cable

length 2 m, 10- to 14-pole

For connecting the operator panel to the communication module

Enabling modules (replacement)

Interface covers (replacement)

3RA6935-0A

3RA2711-0EE11

3RA6936-0A

3RA6936-0B

¹⁾ Suitable only for communication through IO-Link.

For manuals, see
<http://support.automation.siemens.com/WW/view/en/39319600>.

Contactors and Contactor Assemblies

Function Modules for Mounting onto SIRIUS 3RT2 Contactors

SIRIUS



SIRIUS function modules for AS-Interface

Overview

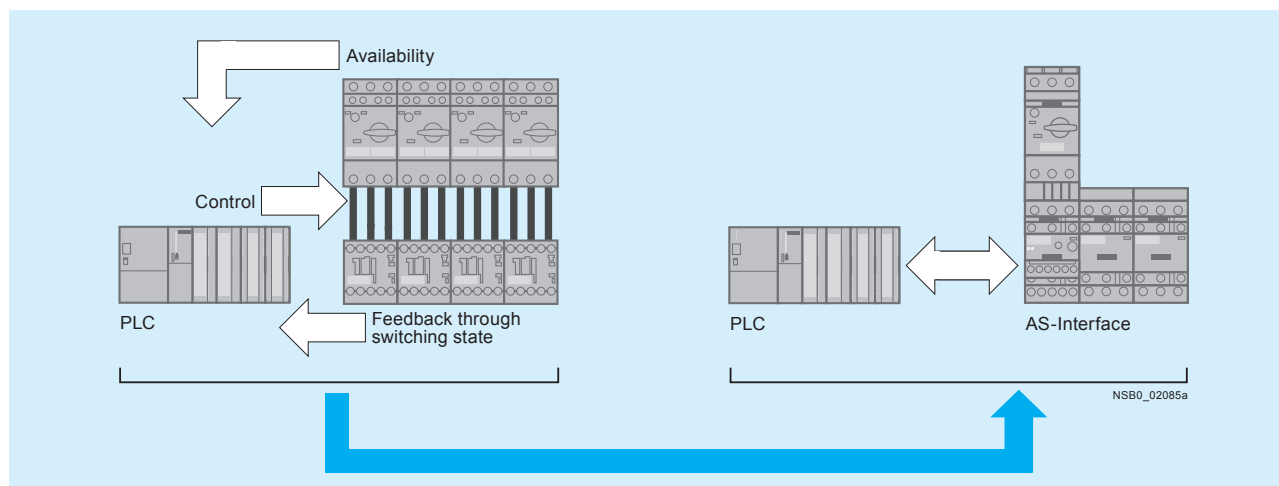
The SIRIUS function modules for AS-Interface enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular starter, e. g. timing and interlocking. The electrical and mechanical connection to the contactor is established by snapping on and locking. An additional control circuit for the individual contactors can be eliminated with completely because a varistor is integrated in the modules. Feedback from the contactor contacts is performed with Hall sensors which provide reliable feedback concerning the switching state even under extremely dusty conditions. Connection of the starters to the higher-level control system takes place through AS-Interface with the Specification V2.1 in A/B technology. As the result, up to 62 starters can be con-

nected to one master and the address is entered in normal manner with an addressing unit.

Through the AS-Interface connection to the control system, a maximum of wiring is saved. The wiring outlay is reduced to the control supply voltage and the two individual wires for AS-Interface.

The following essential signals are transmitted:

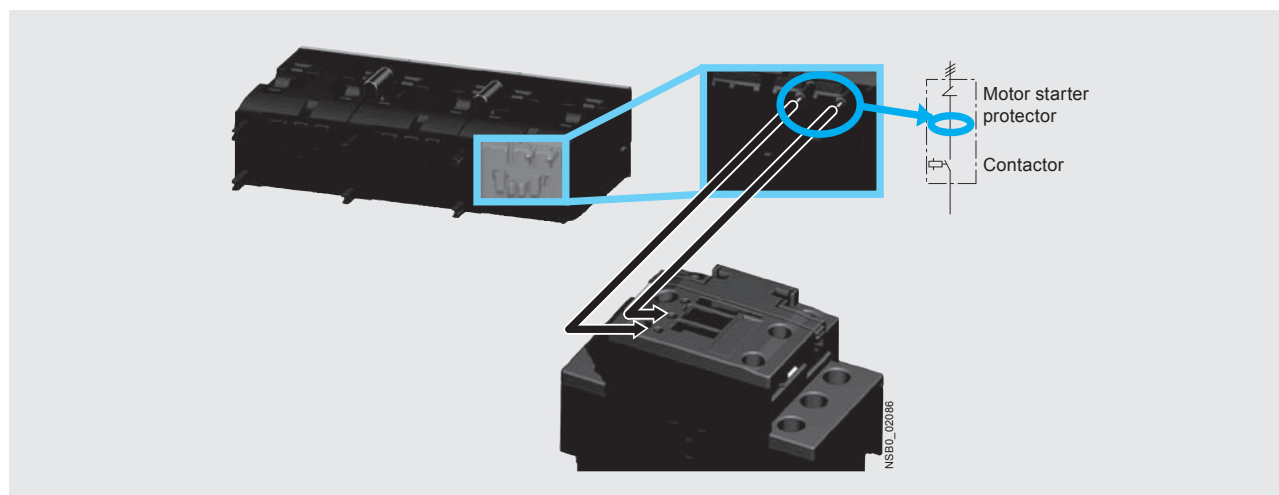
- Availability of the starter in response to an indirect inquiry from the motor starter protector
- Starter operation
- Feedback concerning the switching state of the starter



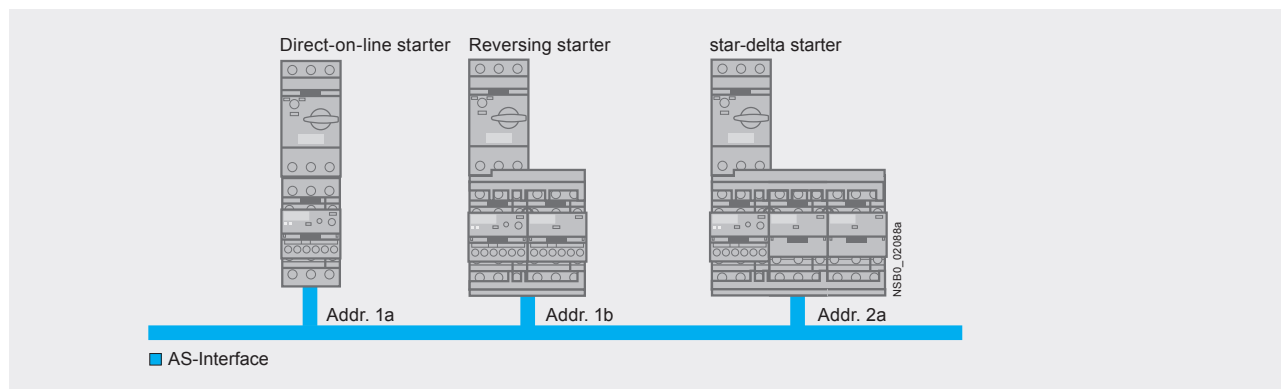
Signal transmission through AS-Interface

The inquiry from the motor starter protector does not take place through additional wiring between the auxiliary switch and the module but by means of a voltage inquiry at the contactor input.

This requires use of communication versions of the contactors with communication interface (see page 2/26).



Availability signal through voltage pick-off



Topology with AS-Interface

This easy integration of the starters in the TIA world does not limit the flexibility in the field in the least. For example, all function modules have special terminals in order to enable direct local disconnection. These terminals can be connected for example,

to a position switch. The input interrupts the voltage supply to the contactor coil directly, i. e. without going through the PLC. These terminals are jumpered in the as-delivered state.

Application

The use of SIRIUS function modules with AS-Interface is recommended above all in machines and plants requiring easy connection of several different sensors and actuators both inside and outside the control cabinet to the higher-level control system. And with IO modules no longer needed, the width of the PLC is far smaller.

Benefits

- Reduction of control current wiring
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Elimination of IO modules saves space in the control cabinet
- All essential timing and interlocking functions for reversing duty and wye-delta starting are integrated
- No additional control circuit required

Contactors and Contactor Assemblies

Function Modules for Mounting onto SIRIUS 3RT2 Contactors







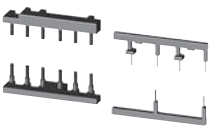


SIRIUS function modules for AS-Interface

• Revised •
04/20/15

SIRIUS



Selection and ordering data

Version		Screw terminals 	Spring-type terminals 	Weight
		Order No.	Order No.	kg
Function modules for direct-on-line starting				
 3RA2712-1AA00  3RA2712-2AA00	AS-Interface connection	3RA2712-1AA00	3RA2712-2AA00	
Function modules for reversing starting¹⁾				
 3RA2712-1BA00  3RA2712-2BA00	AS-Interface connection, comprising one basic and one coupling module	3RA2712-1BA00	3RA2712-2BA00	
 3RA2923-2AA1  3RA2923-2AA2  3RA2933-2AA2	Assembly kits for making 3-pole contactor assemblies The assembly kit contains: mechanical interlock, 2 connecting clips for two contactors, wiring modules on the top and bottom			
	• For size S00	3RA2913-2AA1	3RA2913-2AA2	
	• For size S0 - For main, auxiliary and control current - Only for main current	3RA2923-2AA1 --	-- 3RA2923-2AA2	
	• For size S2 - For main, auxiliary and control current - Only for main current	3RA2933-2AA1 --	-- 3RA2933-2AA2	

Matching contactors with communications interface required;
[see page 2/26](#).

For matching AS-Interface masters, routers and power supply
units, [see Chapter 14 "Industrial Communication"](#).

¹⁾ For prewired contactor assemblies for reversing starting with communication
interface, [see pages 2/40 and 2/43](#). When these contactor assemblies are
used, the assembly kit for the wiring is already integrated.

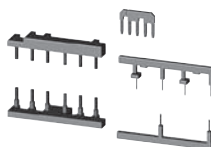
Function modules for wye-delta starting¹⁾



3RA2712-1CA00



3RA2712-2CA00



3RA2923-2BB1



3RA2923-2BB2

AS-Interface connection, comprising one basic module and two coupling modules

Assembly kits for making 3-pole contactor assemblies

The assembly kit contains:
mechanical interlock,
4 connecting clips for 3 contactors;
star jumper,
wiring modules on the top and bottom

- For size S00
- For size S0
 - For main, auxiliary and control circuits
 - Only for main circuit
- For size S2
 - For main, auxiliary and control circuits
 - Only for main circuit

1) For complete contactor assemblies for wye-delta starting including function modules, see pages 2/47 and 2/48.

Version	Screw terminals	Spring-type terminals	Weight
	Order No.	Order No.	kg

3RA2712-1CA00	3RA2712-2CA00
3RA2913-2BB1	3RA2913-2BB2
3RA2923-2BB1	--
--	3RA2923-2BB2
3RA2933-2BB1	--
--	3RA2933-2BB2

Matching contactors with communications interface required; see page 2/26.

For matching AS-Interface masters, routers and power supply units, see Chapter 14 "Industrial Communication".

Accessories



3RA2711-0EE10



3RA2711-0EE06



3RA2711-0EE15



3RA2910-0

Module connector set, comprising:
• 2 module connectors, 14-pole, short
• 2 interface covers

Module connectors

- 14-pole, 9 cm
For size jump + 1 space

Interface covers
(Set of 5)

Sealable covers
For 3RA27, 3RA28, 3RA29

3RA2711-0EE10

3RA2711-0EE06

3RA2711-0EE15

3RA2910-0

For manuals, see <http://support.automation.siemens.com/WW/view/en/39318922>.

Contactors and Contactor Assemblies

Function Modules for Mounting onto SIRIUS 3RT2 Contactors



SIRIUS function modules

• Revised •
09/22/15

SIRIUS



Technical specifications

Type			3RA2811	3RA2831	3RA2812	3RA2832	3RA2816
Can be used for size			S00, S0	S2	S00, S0	S2	S00, S0, S2
Function			ON-delay		OFF-delay with control signal		Wye-delta function
General data							
Rated insulation voltage U_i	V AC		300				
Pollution degree 3							
Overvoltage category III							
Rated impulse withstand voltage U_{imp}	kV AC		4				
Operating range of excitation			0.85 ... 1.1 x U_s , 0.95 ... 1.05 times the rated frequency				
Overvoltage protection			Varistor integrated				
Rated power	W		1				1
• Power consumption at 230 V AC, 50 Hz	VA		1				2
DIAZED protection	Operational class gG	A	--				4
Switching frequency for load							
• With I_g at 230 V AC	h ⁻¹		2 500				--
• With 3RT2 contactor at 230 V AC	h ⁻¹		2 500				--
Recovery time	ms		50				150
Minimum ON period	ms		--				35
Residual current	Max.	mA	5	--			
Voltage drop	Max.	VA	3.5	--			
With conducting output							
Setting accuracy	Typ.		±15 %				
With reference to upper limit of scale							
Repeat accuracy	Max.		±1 %				
Electrical endurance							
• With 3RT2028 contactor	Operating cycles		100 000				--
• At AC-15, 250 V, 3 A	Operating cycles		--				100 000
Mechanical endurance	Operating cycles		100 x 10 ⁶				10 x 10 ⁶
Permissible ambient temperature							
• During operation	°C		-25 ... +60				
• During storage	°C		-40 ... +80				
Degree of protection acc. to IEC 60947-1, Appendix C			IP20				
Shock resistance	g/ms		15/11				
Half-sine acc. to IEC 60068-2-27							
Vibration resistance							
According to IEC 60068-2-6	Hz/mm		10 ... 55/0.35				
Electromagnetic compatibility (EMC)			IEC 61000-6-2, IEC 61000-6-4, IEC 61812-1, IEC 60947-4-1				
Overvoltage protection			Varistor integrated				
Permissible mounting position			Any (see contactor)				
Conductor cross-sections							
Connection type (1 or 2 conductors can be connected)			 Screw terminals				
• Solid	mm ²		1 x (0.5 ... 4), 2 x (0.5 ... 2.5)				--
• Finely stranded with end sleeve	mm ²		1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)				--
• AWG cables, solid or stranded	AWG		2 x (20 ... 14)				--
• Terminal screws			M3 (for standard screw driver size 2 or Pozidriv 2)				--
• Tightening torque	Nm		0.8 ... 1.2				--
Connection type (1 or 2 conductors can be connected)			 Spring-type terminals				
• Operating devices	mm		3.0 x 0.5				--
• Solid	mm ²		2 x (0.25 ... 1.5)				--
• Finely stranded with end sleeve	mm ²		2 x (0.25 ... 1.5)				--
• Finely stranded	mm ²		2 x (0.25 ... 1.5)				--
• AWG cables, solid or stranded	AWG		2 x (24 ... 16)				--

**Design****Complete equipment assemblies**

The fully wired reversing contactor assemblies are suitable for use in any climate. They are safe from touch to EN 50274.

The contactor assemblies each consist of two contactors with identical ratings. The contactors are mechanically and electrically interlocked (NC contact interlock). The main and control circuits are wired according to the circuit diagrams on page 2/199.

For motor protection, either 3RU2 or 3RB3 overload relays for direct mounting or individual mounting or thermistor motor protection tripping units must be ordered separately.

Components for customer assembly

Installation kits for all sizes are available for customer assembly of reversing contactor assemblies.

Contactors, overload relays, the mechanical interlock and — for momentary-contact operation — auxiliary switch blocks for latching must be ordered separately

The following points should be noted:

Size S00

- For maintained-contact operation: use contactors with an NC contact in the basic unit for the electrical interlock.
- For momentary-contact operation: use contactors with an NC contact in the basic unit for the electrical interlock; in addition, an auxiliary switch block with at least one NO contact for latching is required per contactor.

Size S0 and S2

Contactors come equipped with integrated 1 NO and 1 NC aux contacts in each contactor. Both electrical interlocking and latching are satisfied with the integrated auxiliaries. Mechanical interlocking is required in either size and comes in the assembly kits except for size S2 where you need to order 3RA2934-2B interlock separately.

Sizes S3

- For maintained-contact operation: the contactors have no auxiliary contact in the basic unit; NC contacts for the electrical interlock are therefore integrated in the mechanical interlock that can be mounted on the side of each contactor (one contact each for the left and right-hand contactors).
- For momentary-contact operation: the electrical interlock is the same as for maintained-contact operation; in addition, an auxiliary switch with one NO contact for latching is required per contactor. This contact can be snapped onto the top of the contactors. Alternatively, auxiliary switch blocks mounted on the side can be used; they must be fitted onto the outside of each contactor.

If the front-mounted mechanical interlock is used for size S2 to S3 contactors, two location holes for single-pole auxiliary switch blocks are provided on the front of each S2 contactor while three additional, single-pole auxiliary switch blocks can be snapped onto S3 contactors. The maximum auxiliary switch complements per contactor stated on page 2/12 must not be exceeded.

When size S3 contactors are combined with a front-mounted mechanical interlock, the 3RA19 33-2B and 3RA19 43-2B installation kits cannot be used.

Sizes S6 to S12

To insert the mechanical interlock, the prestamped location holes positioned opposite on the contactor must be knocked out. The internal auxiliary contacts (up to 1 NO + 1 NC per contactor) can be used for the electrical interlock and latching. The mechanical interlock itself does not contain any auxiliary contacts. Additional auxiliary contacts can be used on the outside and front (on the front in the case of 3RT10) of the reversing contactor assembly.

Principle of operation

The operating times of the individual 3RT10/20 contactors are rated in such a way that no overlapping of the contact making and the arcing time between two contactors can occur on reversing, providing they are interlocked via their auxiliary switches (NC contact interlock) and the operating mechanisms. An additional dead interval of 50 ms is necessary on reversing if the individual contactors are used at voltages > 500 V. The operating times of the individual contactors are not affected by the mechanical interlock.

Surge suppression**Sizes S00 to S3**

All contactor assemblies can be fitted with RC elements or varistors for damping opening surges in the coil.

As with the individual contactors, the surge suppressors can either be plugged onto the front of the contactors (S00) or fitted onto the coil terminals on the top or bottom (S3). For sizes S0 and S2, the surge protection fits behind the hinged door on the front of the contactor and does not take up any additional space.

Sizes S6 to S12

The contactors are fitted with varistors as standard.

Contactors and Contactor Assemblies

Contactor Assemblies for Switching Motors

3RA13 and 3RA23 reversing contactor assemblies

• Revised •
04/20/15

SIRIUS



Overview

The 3RA13 and 3RA23 reversing contactor assemblies can be ordered as follows:

Sizes S00 to S3

- Fully wired and tested, open type, with mechanical and electrical interlock. ¹⁾

Sizes S00 to S12

- As components for customer assembly.

There is also a range of accessories (auxiliary switch blocks, surge suppressors, etc.) that must be ordered separately.

For overload relays for motor protection, see section 3.

The 3RA23 and 3RA13 contactor assemblies have screw connections and are available for screwing or snapping onto 35 mm standard mounting rails. The 3RA23 contactor assemblies are also available with spring-type terminals.

The Ⓢ and Ⓣ approvals only apply to the complete contactor assemblies and not to the components for customer assembly.

AC and DC operation

See pages 2/40 through 2/44 for complete part numbers.

Maximum horsepower rating at 460 V AC	AC-3 maximum inductive current	Size	Order No.					Fully wired and tested contactor assembly
			Contactor	Mechanical interlock ²⁾	Mechanical interlock ³⁾	Mechanical interlock ⁴⁾	Installation kit	
HP	A							
3	7	S00	3RT20 15	3RA29 13-2AA1 ⁶⁾	–	–	3RA29 13-2AA1 ⁶⁾	3RA23 15-8XB30- ...
5	9		3RT20 16					3RA23 16-8XB30- ...
7.5	12		3RT20 17					3RA23 17-8XB30- ...
10	16		3RT20 18					3RA23 18-8XB30- ...
7.5	12	S0	3RT20 24	3RA29 23-2AA1 ⁶⁾	–	–	3RA29 23-2AA1 ⁶⁾	3RA23 24-8XB30- ...
10	16		3RT20 25					3RA23 25-8XB30- ...
15	25		3RT20 26					3RA23 26-8XB30- ...
20	32		3RT20 27					3RA23 27-8XB30- ...
25	38		3RT20 28					3RA23 28-8XB30- ...
30	40	S2	3RT20 35	3RA29 34-2B	–	–	3RA29 33-2AA1 ⁷⁾	3RA23 35-8XB30-1 ..
40	50		3RT20 36					3RA23 36-8XB30-1 ..
50	65		3RT20 37					3RA23 37-8XB30-1 ..
50	80		3RT20 38					3RA23 38-8XB30-1 ..
50	65	S3	3RT10 44	3RA19 24-2B	3RA19 24-1A	–	3RA19 43-2A ⁸⁾	3RA13 44-8XB30-1 ..
60	80		3RT10 45					3RA13 45-8XB30-1 ..
75	95		3RT10 46					3RA13 46-8XB30-1 ..
100	115	S6	3RT10 54	–	–	3RA19 54-2A	3RA19 53-2A ⁹⁾	–
125	150		3RT10 55					–
150	185		3RT10 56					–
150	225	S10	3RT10 64	–	–	3RA19 54-2A	3RA19 63-2A ⁹⁾	–
200	265		3RT10 65					–
250	300		3RT10 66					–
300	400	S12	3RT10 75	–	–	3RA19 54-2A	3RA19 73-2A ⁹⁾	–
400	500		3RT10 76					–

For accessories, see page 2/80-2/83.
For circuit diagrams, see page 2/199.
For dimension drawings, see page 2/218-2/220.

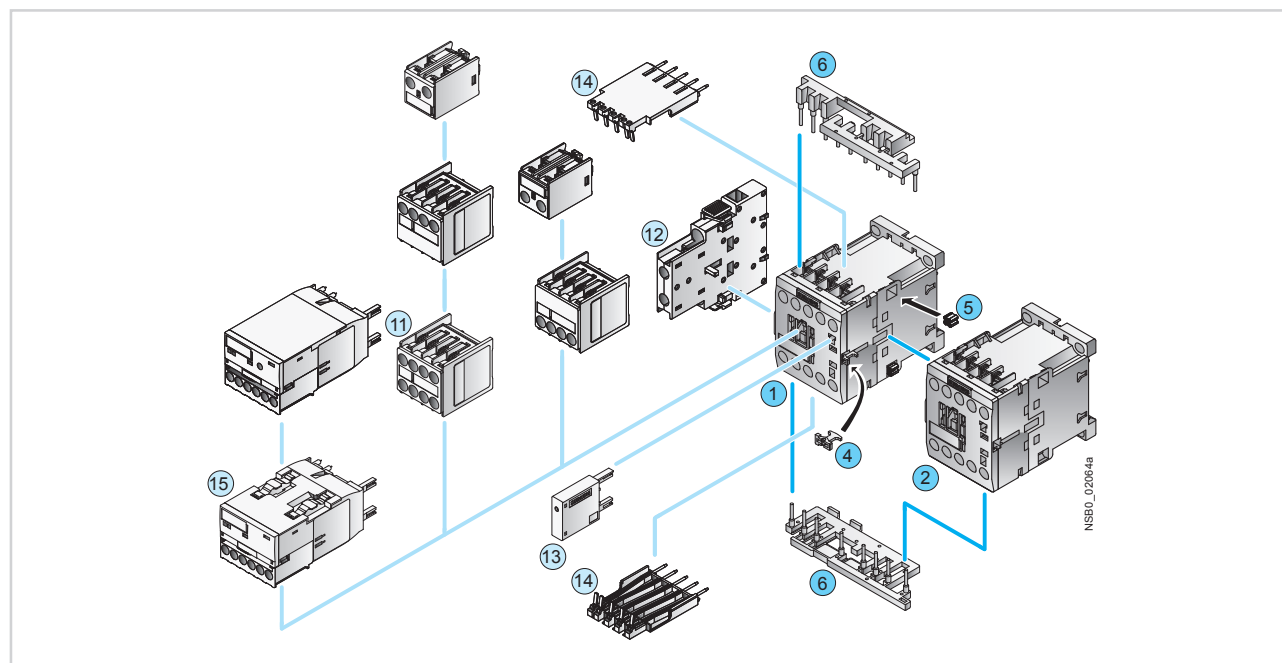
- 1) An additional dead interval of 50 ms is necessary on reversing at voltages > 500 V.
- 2) Laterally mountable with one auxiliary contact (except no auxiliary contact in S2)
- 3) For front mounting with one auxiliary contact.
- 4) Laterally mountable without auxiliary contact.
- 5) Interlock must be ordered with installation kit.
- 6) Installation kit contains: mechanical interlock; 2 connecting clips for 2 contactors; wiring connectors on the top and bottom.

- 7) Installation kit contains: 2 connecting clips for 2 contactors; wiring connectors on the top and bottom and the mechanical interlock.
- 8) Installation kit contains: 2 connecting clips for 2 contactors; wiring connectors on the top and bottom.
- 9) Installation kit contains: wiring connector on the top and bottom.

Selection and ordering data

Fully wired and tested contactor assemblies · Size S00 · Up to 10 HP

The figure shows the version with screw terminals



Mountable accessories			Fully wired and tested contactor assemblies			
Accessories	Order No.	Page	Individual parts	Order No.	Q11	Q12
⑪ Auxiliary switch block, front ¹⁾	3RH29 11-1...	2/66	① ② Contactor, 3 HP	3RT20 15	3RT20 15	2/8
⑫ Auxiliary switch block, lateral	3RH29 21-1DA..	2/68	① ② Contactor, 5 HP	3RT20 16	3RT20 16	2/8
⑬ Surge suppressor	3RT29 16-1...	2/73	① ② Contactor, 7.5 HP	3RT20 17	3RT20 17	2/8
⑭ Solder pin adapter	3RT19 16-4KA1	2/78	① ② Contactor, 10 HP	3RT20 18	3RT20 18	2/8
⑮ Function module for connection to the control system	3RT27 1.-1BA00	2/30	④ ⑤ ⑥ Assembly kit comprising:	3RA29 13-2AA1		2/81
			④ Mechanical interlocks			
			⑤ 2 connecting clips for 2 contactors			
			⑥ Wiring modules on the top and bottom for connecting the main current paths, electrical interlock included ²⁾ , interruptible (NC contact interlock)			

¹⁾ Auxiliary switch block according to EN 50005 must be used.

²⁾ 3RT20 1.. contactors with one NC contact in the basic unit are required for the electrical interlock.

Contactor and Contactor Assemblies

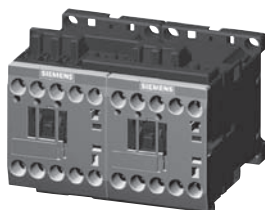
Contactor Assemblies for Switching Motors

3RA23 reversing contactor assemblies

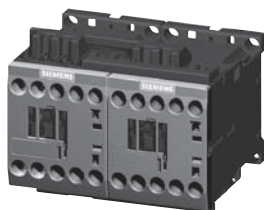
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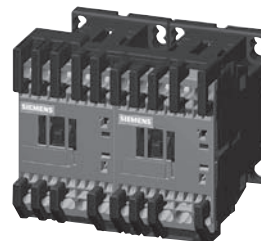
Fully wired and tested contactor assemblies²⁾ · Size S00 · Up to 10 HP





3RA23 18-8XE30-1BB4



3RA23 1.-8XB30-1A..



3RA23 1.-8XB30-2A..

AC data	UL data									Screw terminals		Weight approx.
Amp ratings	Single-phase HP ratings		Three-phase HP ratings		Rated control supply voltage U_s at 50/60 Hz		Auxiliary contacts		Spring-type terminals			
AC2/AC3	115 V	230 V	200 V	230 V	460 V	575 V	NO	NC	Order No.			
V												kg
AC operation, 50/60 Hz												
Size $S00^{1)}$												
7	1/4	3/4	1 1/2	2	3	5	24 AC	0	2	3RA23 15-8XB30-□AB0	0.46/0.50	
7	1/4	3/4	1 1/2	2	3	5	110/120 AC	0	2	3RA23 15-8XB30-□AK6	0.46/0.50	
7	1/4	3/4	1 1/2	2	3	5	220/240 AC	0	2	3RA23 15-8XB30-□AP6	0.46/0.50	
9	1/3	1	2	3	5	7 1/2	24 AC	0	2	3RA23 16-8XB30-□AB0	0.46/0.50	
9	1/3	1	2	3	5	7 1/2	110/120 AC	0	2	3RA23 16-8XB30-□AK6	0.46/0.50	
9	1/3	1	2	3	5	7 1/2	220/240 AC	0	2	3RA23 16-8XB30-□AP6	0.46/0.50	
12	1/2	2	3	3	7 1/2	10	24 AC	0	2	3RA23 17-8XB30-□AB0	0.46/0.50	
12	1/2	2	3	3	7 1/2	10	110/120 AC	0	2	3RA23 17-8XB30-□AK6	0.46/0.50	
12	1/2	2	3	3	7 1/2	10	220/240 AC	0	2	3RA23 17-8XB30-□AP6	0.46/0.50	
16	1	2	3	5	10	10	24 AC	0	2	3RA23 18-8XB30-□AB0	0.46/0.50	
16	1	2	3	5	10	10	110/120 AC	0	2	3RA23 18-8XB30-□AK6	0.46/0.50	
16	1	2	3	5	10	10	220/240 AC	0	2	3RA23 18-8XB30-□AP6	0.46/0.50	
DC operation												
7	1/4	3/4	1 1/2	2	3	5	24 DC	0	2	3RA23 15-8XB30-□BB4	0.58/0.62	
9	1/3	1	2	3	5	7 1/2	24 DC	0	2	3RA23 16-8XB30-□BB4	0.58/0.62	
12	1/2	2	3	3	7 1/2	10	24 DC	0	2	3RA23 17-8XB30-□BB4	0.58/0.62	
16	1	2	3	5	10	10	24 DC	0	2	3RA23 18-8XB30-□BB4	0.58/0.62	
With communication interface ³⁾												
7	1/4	3/4	1 1/2	2	3	5	24 DC	0	2	3RA23 15-8XE30-□BB4	0.58/0.62	
9	1/3	1	2	3	5	7 1/2	24 DC	0	2	3RA23 16-8XE30-□BB4	0.58/0.62	
12	1/2	2	3	3	7 1/2	10	24 DC	0	2	3RA23 17-8XE30-□BB4	0.58/0.62	
16	1	2	3	5	10	10	24 DC	0	2	3RA23 18-8XE30-□BB4	0.58/0.62	

Screw terminals
Spring-loaded terminals

1
2

For other voltages see page 2/49

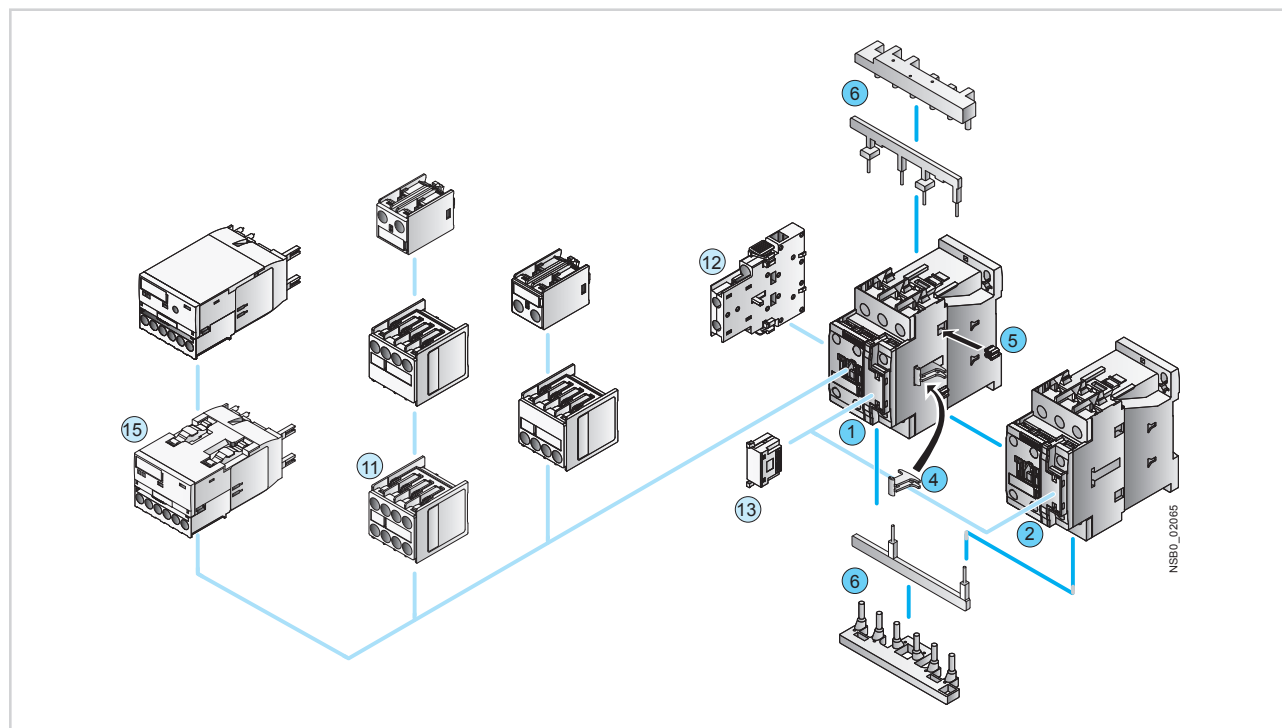
For accessories and spare parts, see page 2/66-2/83.

- 1) For coil operating range, see page 2/49.
- 2) The contactors integrated in the contactor assemblies have no unassigned auxiliary contacts.
- 3) For use with 3RA27 and 3RA28 communication modules. See pages 2/24 to 2/31.



Fully wired and tested contactor assemblies · Size S0 · Up to 25 HP

The figure shows the version with screw terminals



Mountable accessories

Individual parts	Order No.	Page
⑪ Auxiliary switch block, front	3RH29 21-1...	2/66
⑫ Auxiliary switch block, lateral	3RH29 21-1DA..	2/68
⑬ Surge suppressor	3RT29 26-1...	2/73
⑮ Function module for connection to the control system	3RT27 1.-1BA00	2/30

Fully wired and tested contactor assemblies

Individual parts		Order No.		Page
		Q11	Q12	
① ②	Contactor, 7.5 HP	3RT20 24	3RT20 24	2/8
① ②	Contactor, 10 HP	3RT20 25	3RT20 25	2/8
① ②	Contactor, 15 HP	3RT20 26	3RT20 26	2/8
① ②	Contactor, 20 HP	3RT20 27	3RT20 27	2/8
① ②	Contactor, 25 HP	3RT20 28	3RT20 28	2/8
④ ⑤ ⑥	Assembly kit comprising:	3RA29 23-2AA1		2/81
④	Mechanical interlocks			
⑤	2 connecting clips for 2 contactors			
⑥	Wiring modules on the top and bottom for connecting the main current paths, electrical interlock included (NC contact interlock)			

Contactors and Contactor Assemblies

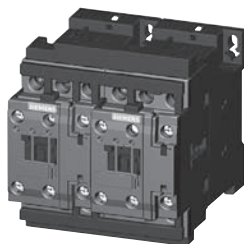
Contactors Assemblies for Switching Motors

**3RA23 reversing
contactor assemblies**

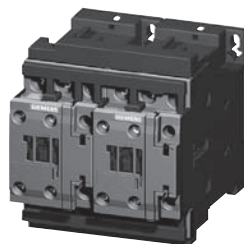
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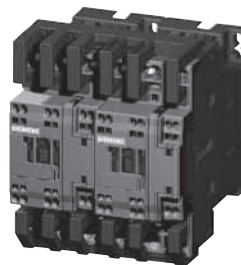
Fully wired and tested contactor assemblies · Size S0 · up to 25 HP



3RA23 24-8XE30-1BB4



3RA23 2.-8XB30-1A..



3RA23 2.-8XB30-2A..

AC data	UL data							Screw terminals		Weight approx.
Amp ratings	Single-phase HP ratings		Three-phase HP ratings		Rated control supply voltage U_s at 50/60 Hz		Auxiliary contacts			
AC2/AC3	115 V	230 V	200 V	230 V	460 V	575 V		NO NC		
V										
Order No.									kg	

AC operation, 50/60 Hz

Size S0¹⁾

12	1	2	3	3	7 1/2	10	24 AC	2	2	3RA23 24-8XB30-□AC2	0.84/0.94
12	1	2	3	3	7 1/2	10	110/120 AC	2	2	3RA23 24-8XB30-□AK6	0.84/0.94
12	1	2	3	3	7 1/2	10	220/240 AC	2	2	3RA23 24-8XB30-□AP6	0.84/0.94
16	1	3	5	5	10	15	24 AC	2	2	3RA23 25-8XB30-□AC2	0.84/0.94
16	1	3	5	5	10	15	110/120 AC	2	2	3RA23 25-8XB30-□AK6	0.84/0.94
16	1	3	5	5	10	15	220/240 AC	2	2	3RA23 25-8XB30-□AP6	0.84/0.94
25	2	3	7 1/2	7 1/2	15	20	24 AC	2	2	3RA23 26-8XB30-□AC2	0.84/0.94
25	2	3	7 1/2	7 1/2	15	20	110/120 AC	2	2	3RA23 26-8XB30-□AK6	0.84/0.94
25	2	3	7 1/2	7 1/2	15	20	220/240 AC	2	2	3RA23 26-8XB30-□AP6	0.84/0.94
32	2	5	10	10	20	25	24 AC	2	2	3RA23 27-8XB30-□AC2	0.84/0.94
32	2	5	10	10	20	25	110/120 AC	2	2	3RA23 27-8XB30-□AK6	0.84/0.94
32	2	5	10	10	20	25	220/240 AC	2	2	3RA23 27-8XB30-□AP6	0.84/0.94
38	3	5	10	10	25	25	24 AC	2	2	3RA23 28-8XB30-□AC2	0.84/0.94
38	3	5	10	10	25	25	110/120 AC	2	2	3RA23 28-8XB30-□AK6	0.84/0.94
38	3	5	10	10	25	25	220/240 AC	2	2	3RA23 28-8XB30-□AP6	0.84/0.94

DC operation

12	1	2	3	3	7 1/2	10	24 DC	2	2	3RA23 24-8XB30-□BB4	1.22/1.32
16	1	3	5	5	10	15	24 DC	2	2	3RA23 25-8XB30-□BB4	1.22/1.32
25	2	3	7 1/2	7 1/2	15	20	24 DC	2	2	3RA23 26-8XB30-□BB4	1.22/1.32
32	2	5	10	10	20	25	24 DC	2	2	3RA23 27-8XB30-□BB4	1.22/1.32
38	3	5	10	10	25	25	24 DC	2	2	3RA23 28-8XB30-□BB4	1.22/1.32

With communication interface²⁾

12	1	2	3	3	7 1/2	10	24 DC	2	2	3RA23 24-8XE30-□BB4	1.22/1.32
16	1	3	5	5	10	15	24 DC	2	2	3RA23 25-8XE30-□BB4	1.22/1.32
25	2	3	7 1/2	7 1/2	15	20	24 DC	2	2	3RA23 26-8XE30-□BB4	1.22/1.32
32	2	5	10	10	20	25	24 DC	2	2	3RA23 27-8XE30-□BB4	1.22/1.32
38	3	5	10	10	25	25	24 DC	2	2	3RA23 28-8XE30-□BB4	1.22/1.32

Screw terminals
Spring-loaded terminals

1
2

For other voltages see page 2/49.

For accessories and spare parts, see page 2/66-2/83.

1) For coil operating range, see page 2/49.

2) For use with 3RA27 and 3RA28 communication modules.
See pages 2/24 to 2/31.

Selection and ordering data

Size S2 · up to 50 HP

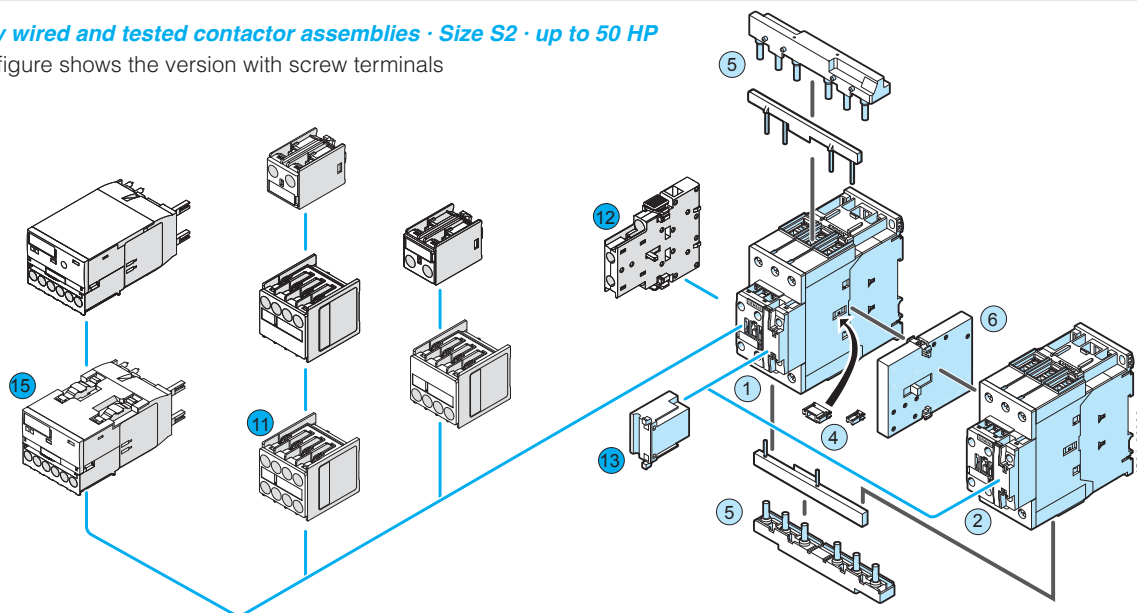
AC data Amp ratings AC2/AC3	UL data Single-phase HP ratings		Three-phase HP ratings				Rated control supply voltage ¹⁾	Auxiliary contacts		Screw Terminals Order No.	Weight approx. kg
	115 V	230 V	200 V	230 V	460 V	575 V		NO	NC		
A	HP	HP	HP	HP	HP	HP					
AC operation											
40	3	7.5	10	15	30	40	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	2 2 2	2 2 2	3RA2335-8XB30-1AC2 3RA2335-8XB30-1AK6 3RA2335-8XB30-1AP6	1.72
50	3	10	15	15	40	50	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	2 2 2	2 2 2	3RA2336-8XB30-1AC2 3RA2336-8XB30-1AK6 3RA2336-8XB30-1AP6	1.72
65	5	10	20	20	50	50	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	2 2 2	2 2 2	3RA2337-8XB30-1AC2 3RA2337-8XB30-1AK6 3RA2337-8XB30-1AP6	2.548
80 ¹⁾	5	15	20	25	50	60	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	2 2 2	2 2 2	3RA2338-8XB30-1AC2 3RA2338-8XB30-1AK6 3RA2338-8XB30-1AP6	2.548
AC/DC operation											
40	3	7.5	10	15	30	40	20-33 AC/DC	2	2	3RA2335-8XB30-1KB4	2.5
50	3	10	15	15	40	50	20-33 AC/DC	2	2	3RA2336-8XB30-1KB4	
65	5	10	20	20	50	50	20-33 AC/DC	2	2	3RA2337-8XB30-1KB4	
80 ¹⁾	5	15	20	25	50	60	20-33 AC/DC	2	2	3RA2338-8XB30-1KB4	

For Reversing
Contactors with
communication
interface: replace
the 8XB30-1NB3
with 8XE30-1NB3.

1) Max UL FLA = 65A at 460V

Fully wired and tested contactor assemblies · Size S2 · up to 50 HP

The figure shows the version with screw terminals



Mountable accessories (optional)

To be ordered separately	Article No.	Page
⑪ Auxiliary switch block, front	3RH2921-1...	2/66
⑫ Auxiliary switch block, lateral	3RH2921-1DA...	2/68
⑬ Surge suppressor	3RT2936-1...	2/72
⑮ Function module for connection to the control system	3RA271.-1BA00	2/30

For further voltages, see page 2/49.
For overview, see page 2/37-2/38.
For accessories, see page 2/66-2/83.
For circuit diagrams, see page 2/200.
For dimension drawings, see page 2/218.

Coil voltage tolerance:
at 50Hz: 0.8 to 1.1 x Us
at 60Hz: 0.85 to 1.1 x Us
at AC/DC: 0.8 to 1.1 x Us

Complete contactor assemblies

Individual parts	Article No.	K1	K2	Page
①②	Contactor, 30 HP	3RT2035	3RT2035	2/8
①②	Contactor, 40 HP	3RT2036	3RT2036	2/8
①②	Contactor, 50 HP	3RT2037	3RT2037	2/8
①②	Contactor, 50 HP	3RT2038	3RT2038	2/79
④⑤	Assembly kit contains: 3RA2933-2AA1 comprising:			
④	2 connecting pins for 2 contactors			
⑤	Wiring modules on the top and bottom for connecting the main and auxiliary current paths, electrical interlock included (NC contact interlock)			
⑥	Mechanical interlock	3RA2934-2B		2/80

Contactors and Contactor Assemblies

Contactor Assemblies for Switching Motors

3RA13 reversing contactor assemblies



Selection and ordering data

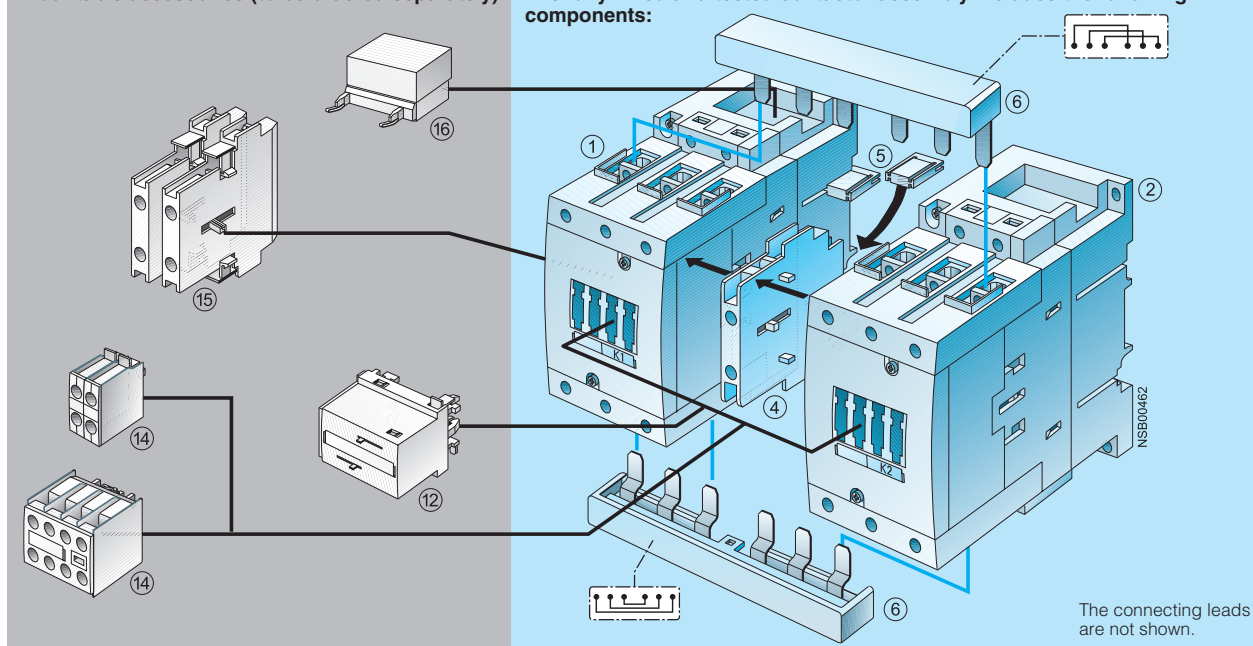
Size S3 · up to 75 HP



AC data Amp ratings AC2/AC3	UL data Single-phase HP ratings		Three-phase HP ratings				Rated control supply voltage ¹⁾	Auxiliary contacts		Fully wired and tested contactor assembly Order No.	Weight approx. kg
	115 V	230 V	200 V	230 V	460 V	575 V		NO	NC		
A	HP	HP	HP	HP	HP	HP					
AC operation											
65	5	15	20	25	50	60	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	0 0 0	2 2 2	3RA1344-8XB30-1AC2 3RA1344-8XB30-1AK6 3RA1344-8XB30-1AP6	3.9
80	7.5	15	25	30	60	75	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	0 0 0	2 2 2	3RA1345-8XB30-1AC2 3RA1345-8XB30-1AK6 3RA1345-8XB30-1AP6	3.9
95	10	20	30	30	75	100	24 V, 50/60 Hz 120 V, 60 Hz 240 V, 60 Hz	0 0 0	2 2 2	3RA1346-8XB30-1AC2 3RA1346-8XB30-1AK6 3RA1346-8XB30-1AP6	3.9
DC operation											
65	5	15	20	25	50	60	24 V DC	0	2	3RA1344-8XB30-1BB4	5.7
80	7.5	15	25	30	60	75	24 V DC	0	2	3RA1345-8XB30-1BB4	
95	10	20	30	30	75	100	24 V DC	0	2	3RA1346-8XB30-1BB4	

Mountable accessories (to be ordered separately):

The fully wired and tested contactor assembly includes the following components:



Accessory	Order No.	Page	Components	Order No.		Page
				K1	K2	
12 Mechanical interlock, mountable on the front	3RA1924-1A	2/80	1 2 Contactors, 50 HP	3RT10 44	3RT10 44	2/8
14 Auxiliary switch block, mountable on the front	3RH1921-1CA..	2/66	1 2 Contactors, 60 HP	3RT10 45	3RT10 45	2/8
15 Auxiliary switch block, laterally mountable	3RH1921-1EA..	2/68	1 2 Contactors, 75 HP	3RT10 46	3RT10 46	2/8
16 Surge suppressor	3RT1926-1.... 3RT1936-1....	2/73	4 Mechanical interlock, laterally mountable	3RA19 24-2B		2/80
			5 6 Installation kit	3RA19 43-2A		2/81

The installation kit contains:

- 5 2 connecting clips for 2 contactors with a clearance of 10 mm
- 6 Wiring connectors on the top and bottom

For further voltages, see page 2/49.
For overview, see page 2/37-2/38.
For accessories, see page 2/66-2/83.
For circuit diagrams, see page 2/200.
For dimension drawings, see page 2/218.

1) Coil voltage tolerance
at 50 Hz: 0.8 ... 1.1 x U_s
at 60 Hz: 0.85 ... 1.1 x U_s



Overview

These 3RA24 contactor assemblies for wye-delta starting are designed for standard applications.

Note:

Contactor assemblies for wye-delta starting in special applications such as very heavy starting or wye-delta starting of special motors must be customized. Help with designing such special applications is available from Technical Assistance.

The 3RA24 contactor assemblies for wye-delta starting can be ordered as follows:

Sizes S00 and S0

- Fully wired and tested, with electrical and mechanical interlock.
- As individual parts for customer assembly.

A dead interval of 50 ms on reversing is already integrated in the function module for wye-delta starting.

There is also a range of accessories (lateral auxiliary switch blocks, etc.) that must be ordered separately.

For overload relays for motor protection see Chapter 3 "Overload Relays" --> "3RB3 Solid-State Overload Relays".

The 3RA24 contactor assemblies have screw or spring-type terminals and are suitable for screwing or snapping onto TH 35 standard mounting rails.

With the fully wired and tested 3RA24 contactor assemblies, the auxiliary contacts included in the basic devices are unassigned.

Motor protection

Overload relays or thermistor motor protection releases can be used for overload protection.

The overload relay can be either mounted onto the line contactor or separately fitted. It must be set to 0.58 times the rated motor current.

Surge suppression

Sizes S00 and S0

Surge suppression (varistor) is included in the function modules for wye-delta starting.

Function modules for wye-delta starting

The 3RA28 16-0EW20 wye-delta function module (see page 2/27) replaces the complete wiring in the control circuit and can be used in the voltage range from 24 to 240 V AC/DC. It is snapped onto the front of the contactor assembly size S00 or S0.

One function module comprises a complete module kit:

- One 3RA29 12-0 basic module with integrated control logic and time setting,
- And two 3RA29 11-0 coupling modules with related connecting cables.

The scope of supply comprises a complete module kit for one contactor assembly for wye-delta starting size S00 or S0, regardless of the connection method.

Screw terminals

Rated data at AC 50 Hz 400 V			Size			
Power kW	Operational current I_e A	Motor current A		Line/delta contactor	Star contactor	Order No. complete
5.5	12	9.5 ... 13.8	S00-S00-S00	3RT20 15-1	3RT20 15-1	3RA24 15-8XF31-1...
7.5	16	12.1 ... 17		3RT20 17-1	3RT20 15-1	3RA24 16-8XF31-1...
11	25	19 ... 25		3RT20 18-1	3RT20 16-1	3RA24 17-8XF31-1...
11	25	19 ... 25	S0-S0-S0	3RT20 24-1	3RT20 24-1	3RA24 23-8XF32-1...
15	32	24.1 ... 34		3RT20 26-1	3RT20 24-1	3RA24 25-8XF32-1...
18.5	40	34.5 ... 40		3RT20 26-1	3RT20 24-1	3RA24 25-8XF32-1...
22	50	31 ... 43		3RT20 27-1	3RT20 26-1	3RA24 26-8XF32-1...

Spring-type terminals

Rated data at AC 50 Hz 400 V			Size			
Power kW	Operational current I_e A	Motor current A		Line/delta contactor	Star contactor	Order No. complete
5.5	12	9.5 ... 13.8	S00-S00-S00	3RT20 15-2	3RT20 15-2	3RA24 15-8XF31-2...
7.5	16	12.1 ... 17		3RT20 17-2	3RT20 15-2	3RA24 16-8XF31-2...
11	25	19 ... 25		3RT20 18-2	3RT20 16-2	3RA24 17-8XF31-2...
11	25	19 ... 25	S0-S0-S0	3RT20 24-2	3RT20 24-2	3RA24 23-8XF32-2...
15	32	24.1 ... 34		3RT20 26-2	3RT20 24-2	3RA24 25-8XF32-2...
18.5	40	34.5 ... 40		3RT20 26-2	3RT20 24-2	3RA24 25-8XF32-2...
25	50	31 ... 43		3RT20 27-2	3RT20 26-2	3RA24 26-8XF32-2...

Note:

The selection of contactor types refers to fused configurations.

Contactors and Contactor Assemblies

3RA24 Contactor Assemblies for Wye-Delta Starting

SIRIUS



3RA24 complete units, 5.5 ... 22 kW

Components for customer assembly

Assembly kits with wiring modules and mechanical connectors are available for contactor assemblies for wye-delta starting. Contactors, overload relays, function modules for wye-delta starting or wye-delta timing relays, auxiliary switches for electrical interlock – if required also feeder terminals and base plates – must be ordered separately.

The wiring kits for sizes S00 and S0 contain the top and bottom main conducting path connections between the line and delta

Screw terminals

Power kW	Accessories for customer assembly			Overload relay, thermal (trip class CLASS 10)		Overload relay, solid-state (trip class CLASS 10)	
	Function modules for wye-delta starting	Assembly kit B, for single infeed	Star jumper	Setting range	Order No.	Setting range	Order No.
5.5	3RA28 16-0EW20	3RA29 13-2BB1 ¹⁾	3RT29 16-4BA31	5.5 ... 8	3RU21 16-1HB0	4 ... 16	3RB30 16-1TB0
7.5				7 ... 10	3RU21 16-1JB0		
11				11 ... 16	3RU21 16-4AB0		
11	3RA28 16-0EW20	3RA29 23-2BB2 ²⁾	3RT29 26-4BA31	11 ... 16	3RU21 26-4AB0	6 ... 25	3RB30 26-1QB0
15				14 ... 20	3RU21 26-4BB0		
18.5				20 ... 25	3RU21 26-4DB0		
22				20 ... 25	3RU21 26-4DB0		

Spring-type terminals

Power kW	Accessories for customer assembly			Overload relay, thermal (trip class CLASS 10)		Overload relay, solid-state (trip class CLASS 10)	
	Function modules for wye-delta starting	Assembly kit B, for single infeed	Star jumper	Setting range	Order No.	Setting range	Order No.
5.5	3RA28 16-0EW20	3RA29 13-2BB1 ¹⁾	3RT29 16-4BA32	5.5 ... 8	3RU21 16-1HC0	4 ... 16	3RB30 16-1TE0
7.5				7 ... 10	3RU21 16-1JC0		
11				11 ... 16	3RU21 16-4AC0		
11	3RA28 16-0EW20	3RA29 23-2BB2 ²⁾	3RT29 26-4BA32	11 ... 16	3RU21 26-4AC0	6 ... 25	3RB30 26-1QE0
15				14 ... 20	3RU21 26-4BC0		
18.5				20 ... 25	3RU21 26-4DC0		
22				20 ... 25	3RU21 26-4DC0		

¹⁾ The assembly kit contains: mechanical interlock, 4 connecting clips; wiring modules on the top (connection between line and delta contactor) and on the bottom (connection between delta and star contactor); star jumper and auxiliary circuit wiring.

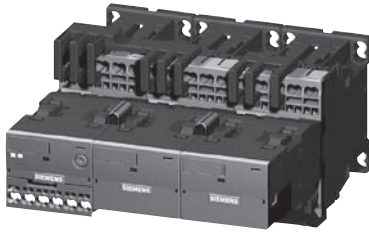
²⁾ The assembly kit contains: mechanical interlock, 4 connecting clips; wiring modules on the top (connection between line and delta contactor) and on the bottom (connection between delta and star contactor); star jumper.

Order No. scheme

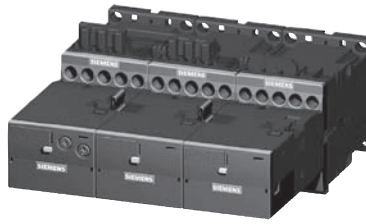
Digit of the Order No.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
SIRIUS contactor assemblies	□ □ □	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
2nd generation				2												
Device type (e. g. 4 = contactor assembly for wye-delta starting)				4												
Contactor size (1 = S00, 2 = S0)						□										
Power dependent on size (e. g. 25 = 15 kW)							□									
Type of overload relay (8X = without)								□	□							
Assembly (F = ready-assembled, E, H = ready-assembled with communication)										□						
Interlock (3 = mechanical and electrical)											□					
Free auxiliary switches (e. g. S00: 1 = 3 NO total, S0: 2 = 3 NO + 3 NC total)												□				
Connection type (1 = screw, 2 = spring)														□		
Operating range / solenoid coil circuit (e. g. A = AC standard / without)															□	
Rated control supply voltage (e. g. K6 = 110/120 V, 50/60 Hz)																□ □
Example	3	R	A	2	4	2	5	–	8	X	F	3	2	–	1	A K 6



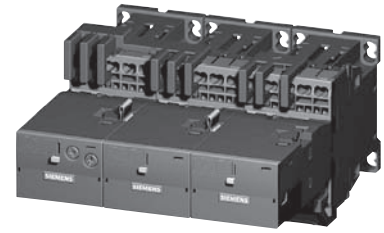
Fully wired and tested contactor assemblies · Size S00-S00-S00 · Up to 11 kW





3RA24 1.-8XE31-2BB4



3RA24 1.-8XF31-1A.0



3RA24 1.-8XF31-2A.0

Rated data AC-3						Rated control supply voltage U_c at 50/60 Hz	Screw terminals			Weight approx.	Spring-type terminals			Weight approx.
Operational current I_e up to							Order No.				Order No.			
400 V A	230 V kW	400 V kW	500 V kW	690 V kW	V									
AC operation, 50/60 Hz									kg				kg	
12	3.3	5.5	7.2	9.2	24 AC	3RA24 15-8XF31-1AB0	0.910	3RA24 15-8XF31-2AB0	0.910					
					110/120 AC	3RA24 15-8XF31-1AF0	0.850	3RA24 15-8XF31-2AF0	0.910					
					220/240 AC	3RA24 15-8XF31-1AP0	0.850	3RA24 15-8XF31-2AP0	0.910					
16	4.7	7.5	10.3	9.2	24 AC	3RA24 16-8XF31-1AB0	0.910	3RA24 16-8XF31-2AB0	0.910					
					110/120 AC	3RA24 16-8XF31-1AF0	0.850	3RA24 16-8XF31-2AF0	0.910					
					220/240 AC	3RA24 16-8XF31-1AP0	0.850	3RA24 16-8XF31-2AP0	0.910					
25	5.5	11	11	11	24 AC	3RA24 17-8XF31-1AB0	0.850	3RA24 17-8XF31-2AB0	0.910					
					110/120 AC	3RA24 17-8XF31-1AF0	0.850	3RA24 17-8XF31-2AF0	0.910					
					220/240 AC	3RA24 17-8XF31-1AP0	0.850	3RA24 17-8XF31-2AP0	0.910					
DC operation														
12	3.3	5.5	7.2	9.2	24 DC	3RA24 15-8XF31-1BB4	0.910	3RA24 15-8XF31-2BB4	0.910					
16	4.7	7.5	10.3	9.2	24 DC	3RA24 16-8XF31-1BB4	0.910	3RA24 16-8XF31-2BB4	0.910					
25	5.5	11	11	11	24 DC	3RA24 17-8XF31-1BB4	1.030	3RA24 17-8XF31-2BB4	1.090					
For IO-Link connection														
12	3.3	5.5	7.2	9.2	24 DC	3RA24 15-8XE31-1BB4	1.030	3RA24 15-8XE31-2BB4	1.090					
16	4.7	7.5	10.3	9.2	24 DC	3RA24 16-8XE31-1BB4	1.030	3RA24 16-8XE31-2BB4	1.090					
25	5.5	11	11	11	24 DC	3RA24 17-8XE31-1BB4	1.030	3RA24 17-8XE31-2BB4	1.090					
For AS-Interface connection														
12	3.3	5.5	7.2	9.2	24 DC	3RA24 15-8XH31-1BB4	1.050	3RA24 15-8XH31-2BB4	1.110					
16	4.7	7.5	10.3	9.2	24 DC	3RA24 16-8XH31-1BB4	1.050	3RA24 16-8XH31-2BB4	1.110					
25	5.5	11	11	11	24 DC	3RA24 17-8XH31-1BB4	1.050	3RA24 17-8XH31-2BB4	1.110					

The wye-delta starters listed here are assembled from individual contactors which are UL Listed. The overall assembly Catalog Number is not UL Listed.

For other voltages see page 2/49.

¹⁾ Coil operating range
at 50 Hz: 0.8 ... 1.1 x U_s ; at 60 Hz: 0.85 ... 1.1 x U_s .

Contactors and Contactor Assemblies

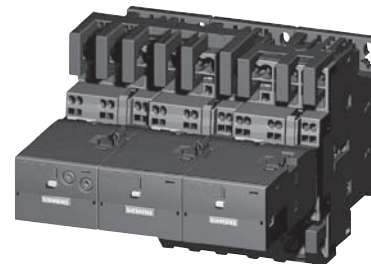
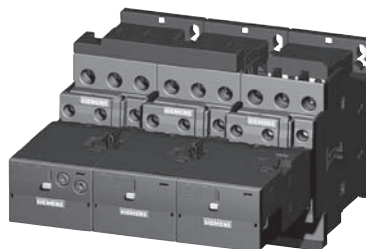
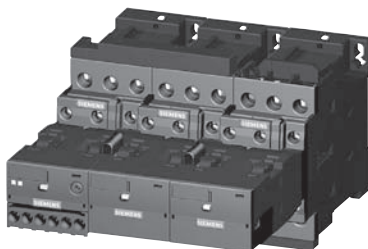
3RA24 Contactor Assemblies for Wye-Delta Starting

3RA24 complete units, 5.5 ... 22 kW

• Revised •
09/30/14





Fully wired and tested contactor assemblies · Size S0-S0-S0 · Up to 22 kW



3RA24 2.-8XE32-1BB4

3RA24 2.-8XF32-1A.2

3RA24 2.-8XF32-2A.2

Rated data AC-3						Rated control supply voltage U_s ¹⁾ at 50/60 Hz	 Screw terminals	Weight approx.	 Spring-type terminals	Weight approx.
Operational current I_e up to 400 V	Ratings of induction motors at 50 Hz and				Order No.					
A	kW	kW	kW	kW	V		kg		kg	
AC operation, 50/60 Hz										
25	7.1	11	15.6	19	24 AC	3RA24 23-8XF32-1AC2	1.370	3RA24 23-8XF32-2AC2	1.530	
					110/220 AC	3RA24 23-8XF32-1AK6	1.370	3RA24 23-8XF32-2AK6	1.530	
					220/240 AC	3RA24 23-8XF32-1AP6	1.370	3RA24 23-8XF32-2AP6	1.530	
32 / 40	11.4	15 / 18.5	19	19	24 AC	3RA24 25-8XF32-1AC2	1.370	3RA24 25-8XF32-2AC2	1.530	
					110/220 AC	3RA24 25-8XF32-1AK6	1.370	3RA24 25-8XF32-2AK6	1.530	
					220/240 AC	3RA24 25-8XF32-1AP6	1.370	3RA24 25-8XF32-2AP6	1.530	
50	--	22	19	19	24 AC	3RA24 26-8XF32-1AC2	1.390	3RA24 26-8XF32-2AC2	1.550	
					110/220 AC	3RA24 26-8XF32-1AK6	1.390	3RA24 26-8XF32-2AK6	1.550	
					220/240 AC	3RA24 26-8XF32-1AP6	1.390	3RA24 26-8XF32-2AP6	1.550	
DC operation										
25	7.1	11	15.6	19	24 DC	3RA24 23-8XF32-1BB4	1.940	3RA24 23-8XF32-2BB4	2.100	
32 / 40	11.4	15 / 18.5	19	19	24 DC	3RA24 25-8XF32-1BB4	1.940	3RA24 25-8XF32-2BB4	2.100	
50	--	22	19	19	24 DC	3RA24 26-8XF32-1BB4	1.960	3RA24 26-8XF32-2BB4	2.120	
For IO-Link connection										
25	7.1	11	15.6	19	24 DC	3RA24 23-8XE32-1BB4	1.940	3RA24 23-8XE32-2BB4	2.100	
32 / 40	11.4	15 / 18.5	19	19	24 DC	3RA24 25-8XE32-1BB4	1.940	3RA24 25-8XE32-2BB4	2.100	
50	--	22	19	19	24 DC	3RA24 26-8XE32-1BB4	1.960	3RA24 26-8XE32-2BB4	2.120	
For AS-Interface connection										
25	7.1	11	15.6	19	24 DC	3RA24 23-8XH32-1BB4	1.960	3RA24 23-8XH32-2BB4	2.120	
32 / 40	11.4	15 / 18.5	19	19	24 DC	3RA24 25-8XH32-1BB4	1.960	3RA24 25-8XH32-2BB4	2.120	
50	--	22	19	19	24 DC	3RA24 26-8XH32-1BB4	1.980	3RA24 26-8XH32-2BB4	2.140	

The wye-delta starters listed here are assembled from individual contactors which are UL Listed. The overall assembly Catalog Number is not UL Listed.

¹⁾ Coil operating range at 50 Hz: 0.8 ... 1.1 x U_s ; at 60 Hz: 0.85 ... 1.1 x U_s .

For other voltages see page 2/49.

Selection and ordering data

Contactor type	3RT201 3RA211	3RT231 3RT251	3RT202 3RA212	3RT232 3RT252	3RT2617 3RT2627 3RT2637	3RT203 3RA213	3RT233 3RT253	3RT104 3RT134 3RT144 3RA114
Rated control supply voltage U_s	S00	S00	S0	S0	S00-S2	S2	S2	S3

Rated control supply voltages (changes to 10th and 11th positions of the Order No.)

AC Operation¹⁾

Coils for 50 Hz (exception: size S00: 50 and 60 Hz ²⁾)	24 V AC	B0	B0	B0	B0	B0	B0	B0
	42 V AC	D0	D0	D0	--	--	D0	--
	48 V AC	H0	H0	H0	--	--	H0	--
	110 V AC	F0	F0	F0	F0	F0	F0	F0
	230 V AC	P0	P0	P0	P0	P0	P0	P0
	400 V AC	V0	V0	V0	V0	V0	V0	V0
Coils for 50 and 60 Hz ²⁾	24 V AC	B0	B0	C2	C2	C2	C2	C2
	42 V AC	D0	D0	D2	D2	--	D2	D2
	48 V AC	H0	H0	H2	H2	--	H2	H2
	110 V AC	F0	F0	G2	G2	G2	G2	G2
	208 V AC	M2	M2	M2	M2	M2	M2	M2
	220 V AC	N2	N2	N2	N2	N2	N2	N2
	230 V AC	P0	P0	L2	L2	L2	L2	L2
	240 V AC	P2	P2	P2	P2	P2	P2	P2
For USA and Canada ³⁾	50 Hz:	60 Hz:						
	110 V AC	120 V AC	K6	K6	K6	K6	K6	K6
	220 V AC	240 V AC	P6	P6	P6	P6	P6	P6
		277 V AC	—	—	U6	—	U6	U6
		480 V AC	V6	—	—	V6	V6	V6
		600 V AC	—	—	T6	—	T6	T6
For Japan	50/60 Hz ⁴⁾ :	60 Hz ⁵⁾ :						
	100 V AC	110 V AC	G6	G6	G6	G6	G6	G6
	200 V AC	220 V AC	N6	N6	N6	N6	N6	N6
	400 V AC	440 V AC	R6	R6	R6	R6	R6	R6

DC Operation¹⁾

12 V DC	A4	A4	—	—	—	—	—	—
24 V DC	B4	B4	B4	B4	—	—	—	B4
42 V DC	D4	D4	D4	D4	—	—	—	D4
48 V DC	W4	W4	W4	W4	—	—	—	W4
60 V DC	E4	E4	E4	E4	—	—	—	E4
72 V DC	J8	J8	J8	J8	—	—	—	J8
80 V DC	—	—	—	—	—	—	—	E8
110 V DC	F4	F4	F4	F4	—	—	—	F4
125 V DC	G4	G4	G4	G4	—	—	—	G4
220 V DC	M4	M4	M4	M4	—	—	—	M4
230 V DC	P4	P4	P4	—	—	—	—	P4

Coil codes for frame sizes S6-S12 can be found on page 2/9. Further voltages on request

Rated control supply voltage	Contactor type	3RT2. 2.-N	Rated control supply voltage	Contactor type	3RT2. 3.-N
$U_{s \min} \dots U_{s \max}^{6)}$	Size S00	S0	$U_{s \min} \dots U_{s \max}^{6)}$	Size S2	S2

Sizes S00 to S2

AC/DC operation (50/60 Hz AC, DC)

21 ... 28 V AC/DC	--	B3	20 ... 33 V AC/DC	B3
95 ... 130 V AC/DC	--	F3	83 ... 155 V AC/DC	F3
200 ... 280 V AC/DC ⁷⁾	--	P3	175 ... 280 V AC/DC	P3

¹⁾ For deviating coil voltages and coil operating ranges of sizes S00 and S0, the SITOP power 24 V DC power supply unit with wide range input (93 to 264 V AC; 30 to 264 V DC) can be used for coil excitation (For more SITOP information see section 15).

²⁾ Coil operating range
at 50 Hz: 0.8 ... 1.1 x U_s
at 60 Hz: 0.85 ... 1.1 x U_s

³⁾ Coil operating range
Size S00: at 50 Hz: 0.85 ... 1.1 x U_s
at 60 Hz: 0.8 ... 1.1 x U_s
Size S0: at 50 Hz and 60 Hz: 0.8 ... 1.1 x U_s

⁴⁾ Coil operating range
Size S00: at 50/60 Hz: 0.85 ... 1.1 x U_s
Size S0: at 50 Hz: 0.8 ... 1.1 x U_s
at 60 Hz: 0.85 ... 1.1 x U_s

⁵⁾ Coil operating range
at 60 Hz: 0.8 ... 1.1 x U_s

⁶⁾ Coil operating range for S0: 0.7 x $U_{s \min} \dots 1.3 \times U_{s \max}$
Coil operating range for S2: 0.8 x $U_{s \min} \dots 1.1 \times U_{s \max}$

⁷⁾ The following applies to S0 and $U_{s \max} = 280$ V: Upper limit = 1.1 x $U_{s \max}$

Contactors and Contactor Assemblies

Control Relays, Coupling Relays

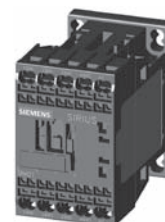


3RH21 control relays, 4-pole

Selection and ordering data
AC and DC operation



3RH11...-1...



3RH11...-2...

Size S00 – Terminal designations according to EN 50011

Rated current at 240 V NEMA A600/Q600	Auxiliary contacts Ident- ification No.	Version I L	Rated control supply voltage U_s	AC Operation Screw Terminals ^{1) 2)}	Rated control supply voltage U_s	DC Operation Screw Terminals ^{1) 2)}
Amps		NO NC	V AC 50/60 Hz ³⁾	Order No.	V DC	Order No.

For screw and snap-on mounting onto TH 35 standard mounting rail

	10	40E	4 —	24 110/120 220/240	3RH2140-1AB00 3RH2140-1AK60 3RH2140-1AP60	24 110 220	3RH2140-1BB40 3RH2140-1BF40 3RH2140-1BM40
	10	31E	3 1	24 110/120 220/240	3RH2131-1AB00 3RH2131-1AK60 3RH2131-1AP60	24 110 220	3RH2131-1BB40 3RH2131-1BF40 3RH2131-1BM40
	10	22E	2 2	24 110/120 220/240	3RH2122-1AB00 3RH2122-1AK60 3RH2122-1AP60	24 110 220	3RH2122-1BB40 3RH2122-1BF40 3RH2122-1BM40

Notes:

For further voltages, see page 2/49.

For accessories, see pages 2/66-2/77.

For technical data, see pages 2/185-2/188.

For overview, see page 2/116.

For position terminals, see page 2/202-2/203.

For dimension drawings, see page 2/124.

1) The 3RH21 contactor relays are also available with spring-type terminals. Replace the 8th digit of the order number with a "2" e.g. "3RH2140-2AB00"

2) The 3RH21 contactor relays are also available with ring lug terminals. Replace the 8th digit of the order number with a "4" e.g. "3RH2140-4AB00"

3) AC coil operating range at 50 Hz: 0.8 to 1.1 x U_s at 60 Hz: 0.85 to 1.1 x U_s

4) For AC-15/AC-14 the following applies: $I_e = 6A$ for mounted auxiliary contacts.

Overview

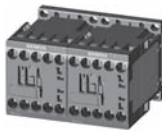
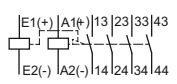
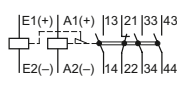
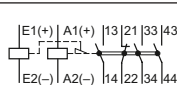
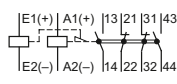
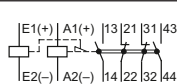
The contactor coil and the coil of the release solenoid are both designed for uninterrupted duty.

The number of auxiliary contacts can be extended by means of front auxiliary switch blocks (up to 4 poles).

RC elements, varistors diodes or diode assemblies can be fitted to both coils from the front for damping opening surges in the coil.

Selection and ordering data

Size S00 – Terminal designations according to EN 5001

Rated current at 240 V AC-14, AC-15 NEMA A600/Q600 Amps	Aux. contacts		Rated control supply voltage U_s V AC	AC Operation Screw Terminals ¹⁾ Order No.	Rated control supply voltage U_s V DC	DC Operation Screw Terminals Order No.
	Ident. No.	Version				
		NO NC				
For screw and snap-on mounting onto TH 35 standard mounting rail						
 3RH2422-1BB40		10	40E	4 —	24, 50/60 Hz 110, 50 Hz / 120, 60 Hz 220, 50 Hz / 240, 60 Hz 230, 50/60 Hz	3RH2440-1AB00 3RH2440-1AK60 3RH2440-1AP60 3RH2440-1AP00
						24 110 125 220
						3RH2440-1BB40 3RH2440-1BF40 3RH2440-1BG40 3RH2440-1BM40
		10	31E	3 1	24, 50/60 Hz 110, 50 Hz / 120, 60 Hz 220, 50 Hz / 240, 60 Hz 230, 50/60 Hz	3RH2431-1AB00 3RH2431-1AK60 3RH2431-1AP60 3RH2431-1AP00
						24 110 125 220
						3RH2431-1BB40 3RH2431-1BF40 3RH2431-1BG40 3RH2431-1BM40
		10	22E	2 2	24, 50/60 Hz 110, 50 Hz / 120, 60 Hz 220, 50 Hz / 240, 60 Hz 230, 50/60 Hz	3RH2422-1AB00 3RH2422-1AK60 3RH2422-1AP60 3RH2422-1AP00
						24 110 125 220
						3RH2422-1BB40 3RH2422-1BF40 3RH2422-1BG40 3RH2422-1BM40

For accessories for 3RH24, see below and page 2/66-2/77

For technical data, see page 2/185-2/188.

For overview, see page 2/116.

For position of terminals, see page 2/202-2/203.


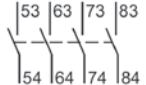
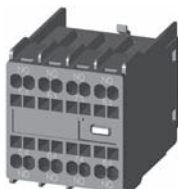
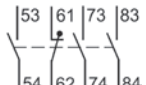
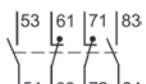
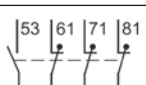
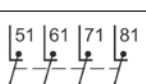
For dimension drawings, see page 2/224.

Auxiliary switch blocks for 3RH21, 3RH24 control relays

Size S00 – For assembling to control relays to have 8 contacts

For contactor type	HS Block Ident. No.	Contacts Version		Weight approx. kg.	Screw Terminals Order No.	Spring Terminals Order No.
		NO	NC			

Auxiliary switch blocks for snapping onto the front according to EN 50011

 3RH2911-1GA40		3RH2140, 3RH2440, Ident. No. 40 E	80E	4 —	0.050	3RH2911-1GA40	3RH2911-2GA40
 3RH2911-2GA40		3RH2140, 3RH2440, Ident. No. 40 E	71E	3 1	0.050	3RH2911-1GA31	3RH2911-2GA31
		3RH2140, 3RH2440, Ident. No. 40 E	62E	2 2	0.050	3RH2911-1GA22	3RH2911-2GA22
		3RH2140, 3RH2440, Ident. No. 40 E	53E	1 3	0.050	3RH2911-1GA13	3RH2911-2GA13
		3RH2140, 3RH2440, Ident. No. 40 E	44E	— 4	0.050	3RH2911-1GA04	3RH2911-2GA04

1) Coil voltage tolerance
at 50 Hz: 0.8 to 1.1 x U_s
at 60 Hz: 0.85 to 1.1 x U_s

For further accessories see pages 2/66-2/77



Application

DC operation

IEC 60 947 and EN 60 947

The 3RH21 coupling relays for switching auxiliary circuits are tailored to the special requirements of working with electronic controls.

The 3RH21 coupling relays cannot be extended with auxiliary switch blocks.

Coupling relays have a low power consumption, an extended coil voltage tolerance and an integrated surge suppressor for damping opening surges on select versions

Selection and ordering data

DC operation

Size S00 – Terminal designations according to EN 50 011

Surge suppressor	Rated current	Auxiliary contacts		Screw Terminals ¹⁾ Order No.	Spring Terminals ¹⁾ Order No.	Weight approx. kg.
	at 240 V NEMA A600/Q600	Ident- ification No.	Version			
	Amps		NO NC			

For screw and snap-on mounting onto TH 35 standard mounting rail

Rated control supply voltage $U_s = 24 \text{ V DC}$, coil voltage tolerance **0.7 to 1.25 x U_s**

Power consumption of the coils **2.8 W** at 24 V (no auxiliary switch blocks can be mounted)



3RH2140-1HB40

Diode, varistor, or RC element can be mounted	10	40E	4	—	3RH2140-1HB40	3RH2140-2HB40	0.300
	10	31E	3	1	3RH2131-1HB40	3RH2131-2HB40	0.300
	10	22E	2	2	3RH2122-1HB40	3RH2122-2HB40	0.300
Diode integrated	10	40E	4	—	3RH2140-1JB40	3RH2140-2JB40	0.300
	10	31E	3	1	3RH2131-1JB40	3RH2131-2JB40	0.300
	10	22E	2	2	3RH2122-1JB40	3RH2122-2JB40	0.300
Suppressor diode integrated	10	40E	4	—	3RH2140-1KB40	3RH2140-2KB40	0.300
	10	31E	3	1	3RH2131-1KB40	3RH2131-2KB40	0.300
	10	22E	2	2	3RH2122-1KB40	3RH2122-2KB40	0.300

Rated control supply voltage $U_s = 24 \text{ V DC}$, coil voltage tolerance **0.85 to 1.85 x U_s**

Power consumption of the coils **1.6 W** at 24 V (no auxiliary switch blocks can be mounted)



3RH2140-2SB40

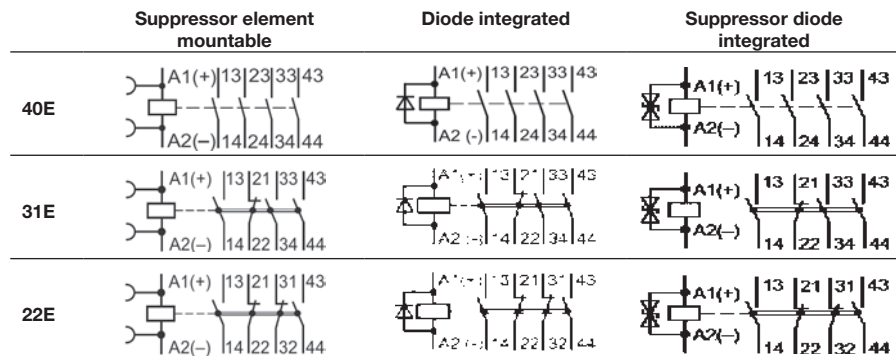
Diode, varistor, or RC element can be mounted	10	40E	4	—	3RH2140-1MB40-0KT0	3RH2140-2MB40-0KT0	0.300
	10	31E	3	1	3RH2131-1MB40-0KT0	3RH2131-2MB40-0KT0	0.300
	10	22E	2	2	3RH2122-1MB40-0KT0	3RH2122-2MB40-0KT0	0.300
Diode integrated	10	40E	4	—	3RH2140-1VB40	3RH2140-2VB40	0.300
	10	31E	3	1	3RH2131-1VB40	3RH2131-2VB40	0.300
	10	22E	2	2	3RH2122-1VB40	3RH2122-2VB40	0.300
Suppressor diode integrated	10	40E	4	—	3RH2140-1SB40	3RH2140-2SB40	0.300
	10	31E	3	1	3RH2131-1SB40	3RH2131-2SB40	0.300
	10	22E	2	2	3RH2122-1SB40	3RH2122-2SB40	0.300

For technical data, see 2/189.

For position of terminals, see 2/202-2/203.

For dimension drawings, see 2/224.

¹⁾ Ring lug terminals are also available.
Replace the 8th digit of the order number with a "4", e.g. 3RH2140-4HB40



Selection and ordering data

Maximum inductive current AC-3	Maximum power ratings					Max. resistive current AC-1	Auxiliary contacts		Rated control supply voltage ¹⁾	Order No.	Weight approx.
	UL Ratings	200 V	230 V	460 V	575 V	IEC ratings 1000 V					
A	HP	HP	HP	HP	kW	A	NO	NC	V		kg

AC operation ^{2) 3)}

3TF68



Size 14
Auxiliary and control conductors: screw terminals
Main conductor: bar connections
• AC Operation

630	200	250	500	600	600	700	4	4	110-132, 50/60 Hz	3TF6844-■CF7	15
630	200	250	500	600	600	700	4	4	200-240, 50/60 Hz	3TF6844-■CM7	15
820	290	350	700	860	800	910	4	4	110-132, 50/60 Hz	3TF6944-■CF7	19
820	290	350	700	860	800	910	4	4	200-240, 50/60 Hz	3TF6944-■CM7	19

UL ratings shown in above table:
For IEC use only up to 1000 V:

■=0
■=8

• DC Operation

630	200	250	500	600	600	700	3	3	24 V DC	3TF6833-■DB4	16.9
820	290	350	700	860	800	910	3	3	24 V DC	3TF6933-■DB4	20.9

UL ratings shown in above table:
For IEC use only up to 1000 V:

■=1
■=8

Accessories and Spare parts for 3TF68 and 3TF69 vacuum contactors

Selection and ordering data

Details	For contactor type	Order No.	Weight approx.
			kg

Coils



3TY7

AC Operation

The coils are fitted with varistors for damping surges as standard; the coil is supplied with the closing electronics included.

DC Operation

Reversing contactors are required for size 14 contactors:

Contactor type	Reversing contactor type	
3TF68 and 3TF69:	3TC44 (70 mm wide, 85 mm high)	3TF68 3TF69

The coils are supplied without a reversing contactor.

●● For rated control supply voltages, see page 2/102.

3TF68	3TY7683-0C●●	0.65
3TF69	3TY7693-0C●●	
3TF68	3TY7683-0D●●	0.56
3TF69	3TY7693-0D●●	

Vacuum interrupters

In order to ensure reliable operation of the contactors, only Siemens original replacement interrupters should be used.	3TF68	3TY7680-0B	3.2
3 vacuum interrupters with mounting parts per set.	3TF69	3TY7690-0B	3.5

Auxiliary switch blocks with screw terminals



3TY7561-1.

1 NO and 1 NC	First auxiliary switch block, left or right. Replacement type for: 3TY7561-1A, -1B	3TF68 / 3TF69	3TY7561-1AA00	0.042
1 NO and 1 NC	First auxiliary switch block, left or right late break	3TF68 / 3TF69	3TY7561-1EA00	0.042
1 NO and 1 NC	Second auxiliary switch block, left or right. Replacement type for: 3TY7 561-1K, -1L	3TF68 / 3TF69	3TY7561-1KA00	0.042
Auxiliary switches for coil reconnection, for DC economy circuit with screw connections				
1 NC	Auxiliary switch block late break	3TF68 / 3TF69	3TY7681-1G	0.042
Solid-state compatible auxiliary switch block with screw terminals				
	For mounting onto the side of contactors. For use in dusty atmosphere and electronic circuits with rated operational currents I _e AC-14 and DC-13 from 1 mA to 300 mA at 3 V to 60 V.	3TF68 / 3TF69	3TY7561-1UA00	0.042

For accessories, see page 2/53-2/54.

For technical data, see page 2/172-2/177.

For description, see page 2/117.

For internal circuit diagrams, see page 2/211.

For position of terminals, see page 2/208.

For dimension drawings, see page 2/221.

¹⁾ For further voltages, see page 2/102.

²⁾ Surge suppression integrated: fitted with varistor.

³⁾ For EMC, see description on page 2/117.

3TF68/69 vacuum contactors are supplied with integrated surge suppression for the main conducting paths (for description, see page 2/117). In operation in circuits with DC choppers, frequency converters, variable-speed drives, for example, this protective circuitry is not required. It might be damaged by voltage peaks and harmonics generated, possibly followed by phase-to-phase shortcircuits. For this reason, the contactors can be supplied without overvoltage damping. To order these versions add a "Z" and the order code "A02".






Contactors and Contactor Assemblies

Contactors for Switching Motors

Accessories and Spare parts for
3TF68 and 3TF69 vacuum contactors



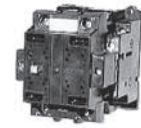
Selection and ordering data

For contactor		Design	Order No.	Weight approx. kg	Std. Pack Qty
Size	Type				
Interface for control by PLC					
	14	3TF68 and 3TF69	Coil voltage tolerance: DC 17 V to 30 V Power consumption: 0.5 W at DC 24 V Fitted with varistor For technical data, see Part 7. For snapping onto the side of auxiliary switch blocks, with surge suppression	3TX7 090-0D	0.1 1
Terminal covers					
	14	3TF68	for protection against inadvertent contact with the exposed busbar connections (DIN VDE 0106 Part 100)*	(Order No. and price per set) 3TX7 686-0A	0.17 1 set = 2 units
		3TF69		3TX7 696-0A	
Link for paralleling (star jumper) · 3-pole, without terminal ¹⁾					
	14	3TF68		3TX7 680-0D	0.26 1
	14	3TF68	• Cover plate for paralleling link A cover plate must be used in order to protect against inadvertent contact (DIN VDE 0106 Part 100).	3TX7 680-0E	0.18 1
Box terminals for laminated copper bars					
	14	3TF68	• Without auxiliary conductor terminal With single covers for protection against inadvertent contact (EN 50274)	3TX7 570-1E	0.6 1
	14	3TF69	• With auxiliary conductor terminal Conductor cross-sections for auxiliary conductors: Solid: 2 × (0.75 ... 2.5) mm ² Finely stranded with end sleeve: 2 × (0.5 ... 2.5) mm ² Solid or stranded: 2 × (18 ... 12) AWG Tightening torque: 0.8 Nm ... 1.4 Nm (7 ... 12 lb.in)	3TX7 690-1F	2.0 1
Surge suppressors — Varistors					
	14	3TF68 and 3TF69	For DC economy circuit; for lateral snapping onto auxiliary switches The varistor is included in the scope of supply of the 3TF68 and 3TF69 contactors with AC operation. Includes the peak value of the alternating voltage on the DC side.	3TX7 572-3G 3TX7 572-3H 3TX7 572-3J	0.09 1 0.09 1 0.09 1

1) The link for paralleling can be reduced by one pole.

**Ordering information**

- Select Contactor from table below.
- Complete catalog number replace the two daggers (††) with appropriate coil voltage suffix. See corresponding coil voltage suffix table below.
- Technical Data [see page 2/178-2/181](#).
- Dimensions [see page 2/221](#).






3TC44



3TC52

	Frame	Ampere Rating		2 Pole DC HP Ratings (DC-3, DC-5)				Auxiliary contacts		AC-Operated	DC-Operated	
		Open	Enclosed	115 V	230 V	500 V	575 V	NO	NC	Order No.	Order No.	
	Size											
3TC DC Contactors												
2	40	40	5	10	15	15	2	2	3TC4417-0B††	3TC4417-0A††		
4	75	68	8	18	40	45	2	2	3TC4817-0B††	3TC4817-0A††		
8	220	200	25	50	100	100	2	2	3TC5217-0B††	3TC5217-0A††		
12	330	300	40	75	150	150	2	2	3TC5617-0B††	3TC5617-0A††		

Device	Frame Size	Catalog Number						
Coils, AC		24V AC	120V AC	220/240V AC	277V AC	480V AC	600V AC	
	3TC	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0	
	3TC	3TY6483-0AC1	3TY6483-0AK6	3TY6483-0AP6	3TY6483-0AP0	3TY6483-0AV0	3TY6483-0AS0	
	3TC		3TY6523-0AK6	3TY6523-0AP6	3TY6523-0AP0	3TY6523-0AV0		
	3TC		3TY6566-0AK6		3TY6566-0AP0	3TY6566-0AV0	3TY6566-0AS0	
Coils, DC		24V DC	48V DC	110V DC	125V DC	230V DC		
	3TC	3TY6443-0BB4		3TY6443-0BF4	3TY6443-0BG4			
	3TC	3TY6483-0BB4	3TY6483-0BW4	3TY6483-0BF4	3TY6483-0BG4			
	3TC	3TY6523-0BB4		3TY6523-0BF4	3TY6523-0BG4	3TY6523-0BP4		
	3TC	3TY6563-0BB4		3TY6563-0BF4	3TY6563-0BG4	3TY6563-0BP4		



Frame size	Contact type	Mounting position	Solid state	Order No.
Auxiliary Contact Blocks with 1 NO + 1 NC contacts ²⁾				
	2, 4	3TC44 or 3TC48	1st block, left or right	—
			2nd block, left or right	Yes ³⁾
	4	3TC48	2nd block, left ⁵⁾	—
			2nd block, right ⁵⁾	—
3TY6501-1A	8, 12	3TC52 or 3TC56	1st block, left	—
			1st block, right	—
			2nd block, left ⁵⁾	—
			2nd block, right ⁵⁾	—

Coil Suffix Table ††

Replace †† in the contactor Order No. with a coil code from the table below.

V AC 50/60 Hz	Code	V DC	Code
24	C1	24	B4
120	K1*	36	V4
240	P1	48	W4
460	V0	60	E4
600	S0	72	J8
		110	F4
		125	G4
		220	M4
		230	P4

*Use suffix K2 for 3TC44.

Device Type	Frame Size	Catalog Number
Main Contacts ¹⁾		
	3TC44	3TY2440-0A
	3TC48	3TY2480-0A
	3TC52	3TY2520-0A
	3TC56	3TY2560-0A
Arc Chutes		
	3TC44	3TY2442-0A
	3TC48	3TY2482-0A
	3TC52	3TY2522-0A
	3TC56	3TY2562-0A

¹⁾ Main contact kits for size 3TC48 and larger include springs. Smaller sizes do not.

²⁾ On DC operated contactors the maximum number of auxiliary contacts is 2 NO, 2 NC.

³⁾ For use in dusty atmosphere and electronic circuits with rated operational currents I_e AC-14 and DC-13 from 1 mA to 300 mA at 3V to 60V. With 1 changeover contact.

⁴⁾ Discount Code: DC Contactors

⁵⁾ Can only be mounted on AC-operated contactors.






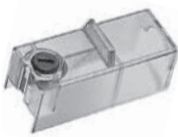
DC Power Controls

DC Contactor Replacement Parts

General Purpose - Type 3TC

SIRIUS

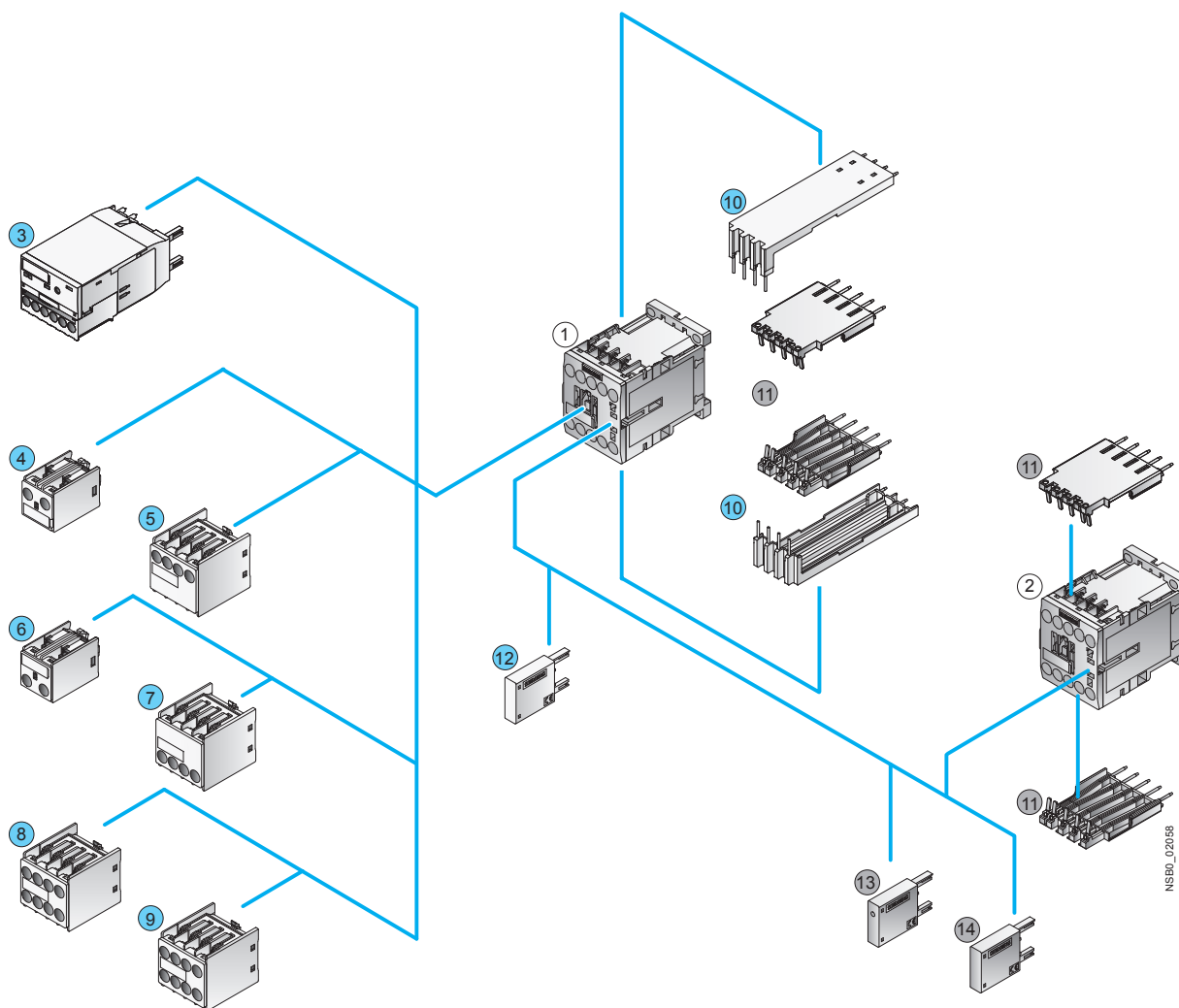


For contactors		Version	Rated control supply voltage U_s		Order No.	Std. Pack Qty	
Size	Type		V AC	V DC			
Surge suppressors · Varistors							
	2	3TC44 ¹⁾	Varistors ²⁾ with line spacer, for mounting onto the coil terminal	24 ... 48 48 ... 127 127 ... 240 240 ... 400 400 ... 600	24 ... 70 70 ... 150 150 ... 250	3TX7 402-3G 3TX7 402-3H 3TX7 402-3J 3TX7 402-3K 3TX7 402-3L	1 1 1 1 1
3TX7 402-3.	4	3TC48	Varistors ²⁾ for sticking onto the contactor base or for mounting separately	24 ... 48 48 ... 127 127 ... 240 240 ... 400 400 ... 600	24 ... 70 70 ... 150 150 ... 250	3TX7 462-3G 3TX7 462-3H 3TX7 462-3J 3TX7 462-3K 3TX7 462-3L	1 1 1 1 1
	8 and 12	3TC52, 3TC56	Varistor for sticking onto the contactor base or for mounting separately	24 ... 48 48 ... 127 127 ... 240 240 ... 400 400 ... 600		3TX7 462-3G 3TX7 462-3H 3TX7 462-3J 3TX7 462-3K 3TX7 462-3L	1 1 1 1 1
3TX7 462-3.	8 and 12	3TC52, 3TC56	Varistors ²⁾ for separate screw connection or snapping onto TH 35 standard mounting rail		24 ... 70 70 ... 150 150 ... 250	3TX7 522-3G 3TX7 522-3H 3TX7 522-3J	1 1 1
							
3TX7 522-3.							
Surge suppressors · RC elements							
	4	3TC48	RC elements For lateral snapping onto auxiliary switch or TH 35 standard mounting rail	24 ... 48 48 ... 127 127 ... 240 240 ... 400 400 ... 600	24 ... 70 70 ... 150 150 ... 250	3TX7 462-3R 3TX7 522-3R 3TX7 462-3S 3TX7 522-3S 3TX7 462-3T 3TX7 522-3T 3TX7 462-3U 3TX7 462-3V	
3TX7 462-3., 3TX7 522-3.	8 and 12	3TC52, 3TC56	RC elements For lateral snapping onto auxiliary switch or TH 35 standard mounting rail	24 ... 48 48 ... 127 127 ... 240 240 ... 400 400 ... 600		3TX7 522-3R 3TX7 522-3S 3TX7 522-3T 3TX7 522-3U 3TX7 522-3V	
Surge suppressors · Diodes							
	4 to 12	3TC48, 3TC52, . 3TC56	Diode assemblies ³⁾ (diode and Zener diode) for DC solenoid system, for sticking onto the contactor base or for mounting separately		24 ... 250	3TX7 462-3D	
3TX7 462-3.							
Terminal covers							
	6	3TC48	For protection against inadvertent contact with exposed busbar connections. Can be screwed on free screw end. Covers one busbar connection			3TX6 506-3B	1 set= 6 units
3TX6 506-3B	10 and 14	3TC52, 3TC56					3TX6 546-3B

¹⁾ The connection piece for mounting the surge suppressor must be bent slightly.

²⁾ Includes the peak value of the alternating voltage on the DC side.

³⁾ Not for DC economy circuit.



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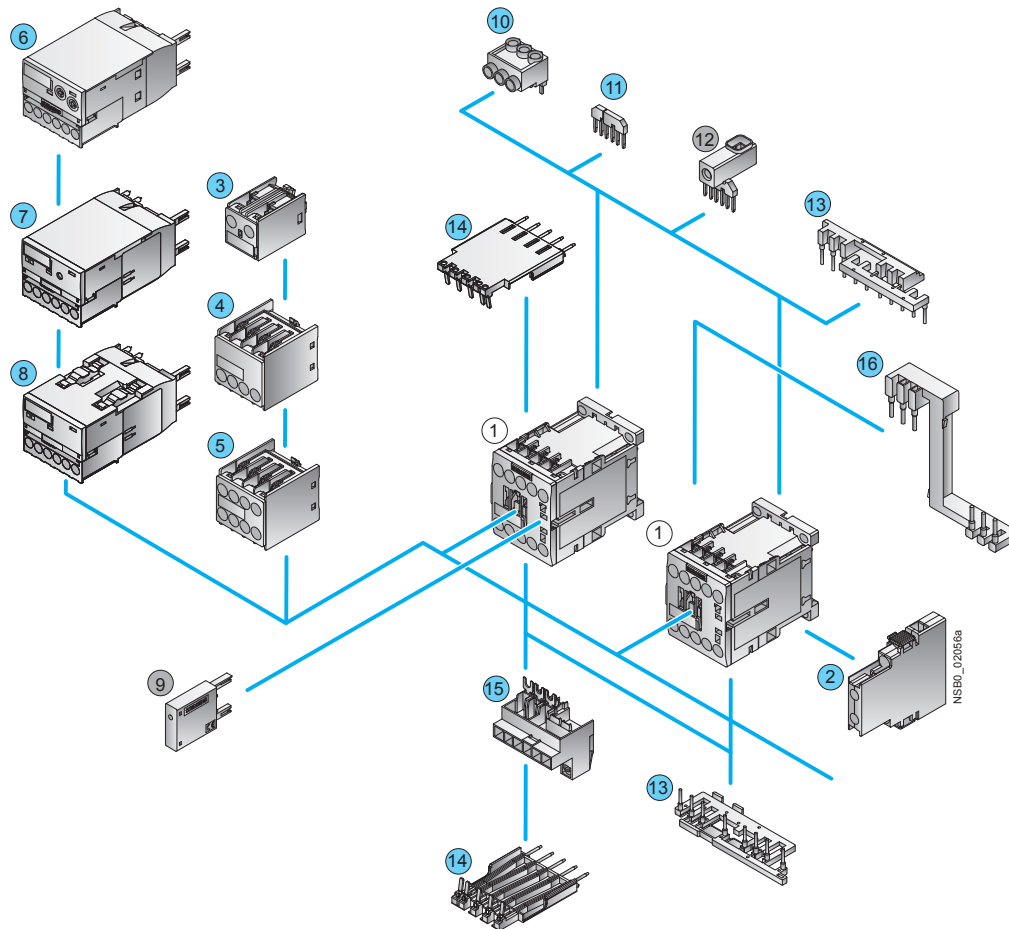
- ① Contactor relay
- ② Coupling relay for auxiliary circuits
- ③ Solid-state timing relay block
- ④ 1-pole auxiliary switch block, cable entry from the top
- ⑤ 2-pole auxiliary switch block, cable entry from the top
- ⑥ 1-pole auxiliary switch block, cable entry from the bottom
- ⑦ 2-pole auxiliary switch block, cable entry from the bottom
- ⑧ 4-pole auxiliary switch block
(terminal designations according to EN 50011 or EN 50005)
- ⑨ 2-pole auxiliary switch block, solid-state compatible version
(terminal designations according to EN 50005)
- ⑩ Solder pin adapter for contactor relays with 4-pole auxiliary switch block
- ⑪ Solder pin adapter for contactor and coupling relays
- ⑫ Additional load module for increasing the permissible residual current
- ⑬ Surge suppressor with LED
- ⑭ Surge suppressor without LED

3RT2 contactors and coupling relays Size S00 with mountable accessories

Overview

The SIRIUS family of controls

The SIRIUS modular system with its components for the switching, starting, protection and monitoring of motors and industrial systems stands for the fast, flexible and space-saving construction of control cabinets.



① Contactor size S00

- ② 1-pole auxiliary switch block, laterally mountable
- ③ 1-pole auxiliary switch block, for snapping onto the front Cable entry from the top
- ④ 2-pole auxiliary switch block, for snapping onto the front Cable entry from the bottom
- ⑤ 4-pole auxiliary switch block, for snapping onto the front
- ⑥ 3RA28 function module
- ⑦ 3RA27 function module for AS-Interface, direct starting
- ⑧ 3RA27 function module for IO-Link, direct starting
- ⑨ Surge suppressor with/without LED
- ⑩ Three-phase feeder terminal

- ⑪ Star jumper, 3-pole, without connecting terminal
- ⑫ Link for paralleling, 3-pole, with connecting terminal
- ⑬ Wiring modules, on the top and bottom (reversing duty)
- ⑭ Solder pin adapter
- ⑮ Connection module (adapter and connector) for contactors with screw-type connection
- ⑯ Safety main current connector for two contactors

- For contactors
- For contactors and coupling contactors (interface)

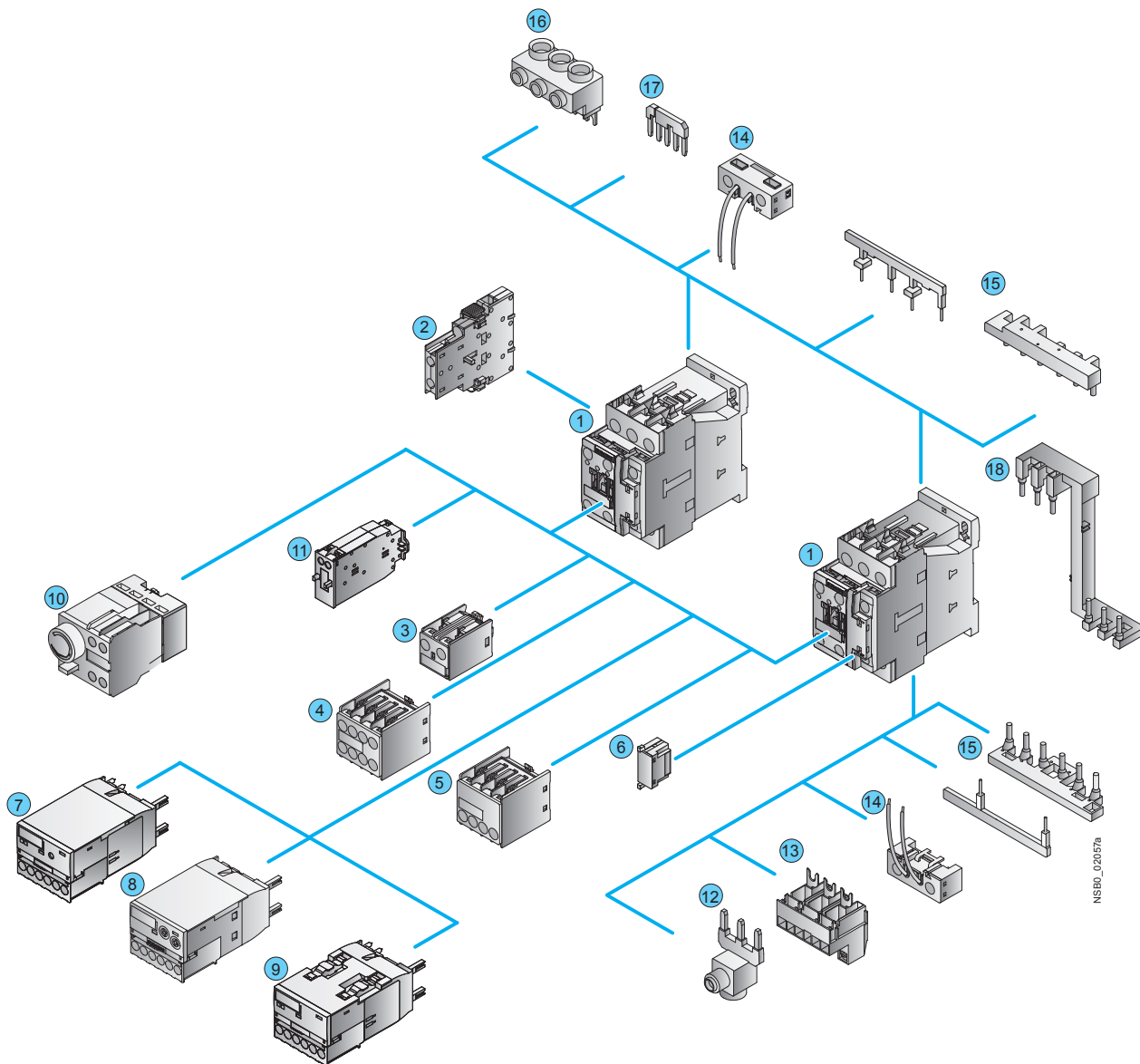
For accessories see [pages 2/66 to 2/83](#).

For contactor assemblies see [pages 2/40 to 2/47](#).

For assembly kit for reversing contactor assemblies (mech. interlocking, wiring modules) see [page 2/81](#).

For mountable overload relays see [Chapter 3, Overload Relays](#)

For Motor Starters see [Chapter 4, Combination Starters](#)



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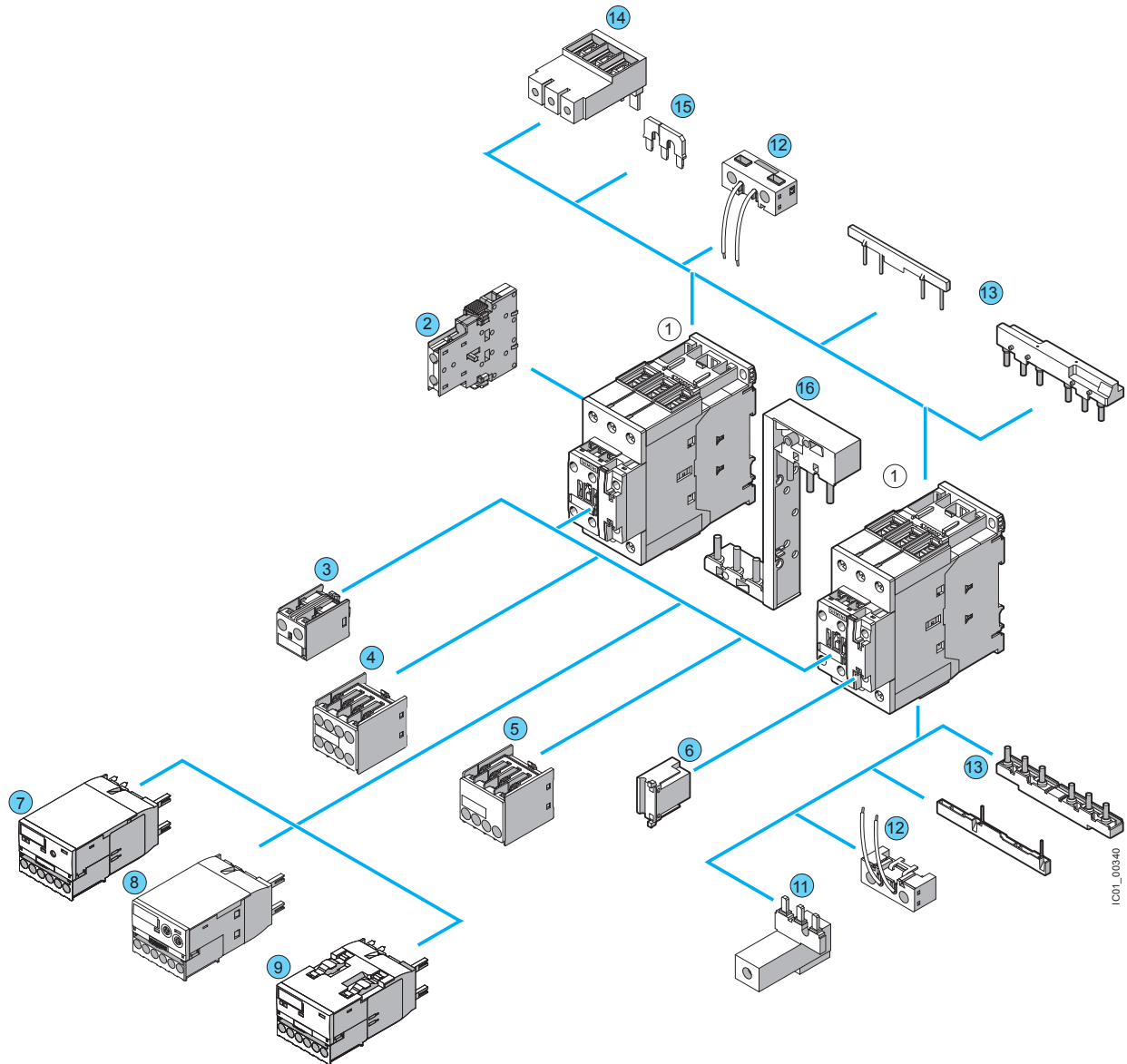
① Contactor size S0

- ② 1-pole auxiliary switch block, laterally mountable
- ③ 1-pole auxiliary switch block, for snapping onto the front Cable entry from the top
- ④ 4-pole auxiliary switch block, for snapping onto the front Cable entry from the bottom
- ⑤ 2-pole auxiliary switch block, for snapping onto the front Cable entry from the bottom
- ⑥ Surge suppressor with/without LED
- ⑦ 3RA27 function module for AS-Interface, direct starting
- ⑧ 3RA28 function module
- ⑨ 3RA27 function module for IO-Link, direct starting
- ⑩ Pneumatic delay block

- ⑪ Mechanical latching block
- ⑫ Link for paralleling, 3-pole, with connecting terminal
- ⑬ Connection module (adapter and plug) for contactors with screw-type connection
- ⑭ Coil terminal module, on the top and bottom
- ⑮ Wiring modules, on the top and bottom (reversing duty)
- ⑯ Three-phase feeder terminal
- ⑰ Link for paralleling (star jumper), 3-pole, without connecting terminal
- ⑱ Safety main current connector for two contactors

For accessories see pages 2/66 to 2/83.

Size S2 with mountable accessories



① Contactor, size S2

② 2-pole auxiliary switch block, laterally mountable

③ 1-pole auxiliary switch block, for snapping onto the front, cable entry from above

④ 4-pole auxiliary switch block, for snapping onto the front

⑤ 2-pole auxiliary switch block, for snapping onto the front, cable entry from below

⑥ Surge suppressor with/without LED

⑦ 3RA27 function modules for AS-Interface, direct start

⑧ 3RA28 function modules

⑨ 3RA27 function modules for IO-Link, direct start

⑪ Link for paralleling, 3-pole, with connection terminal

⑫ Coil terminal module, top and bottom

⑬ Wiring modules, top and bottom (reversing duty)

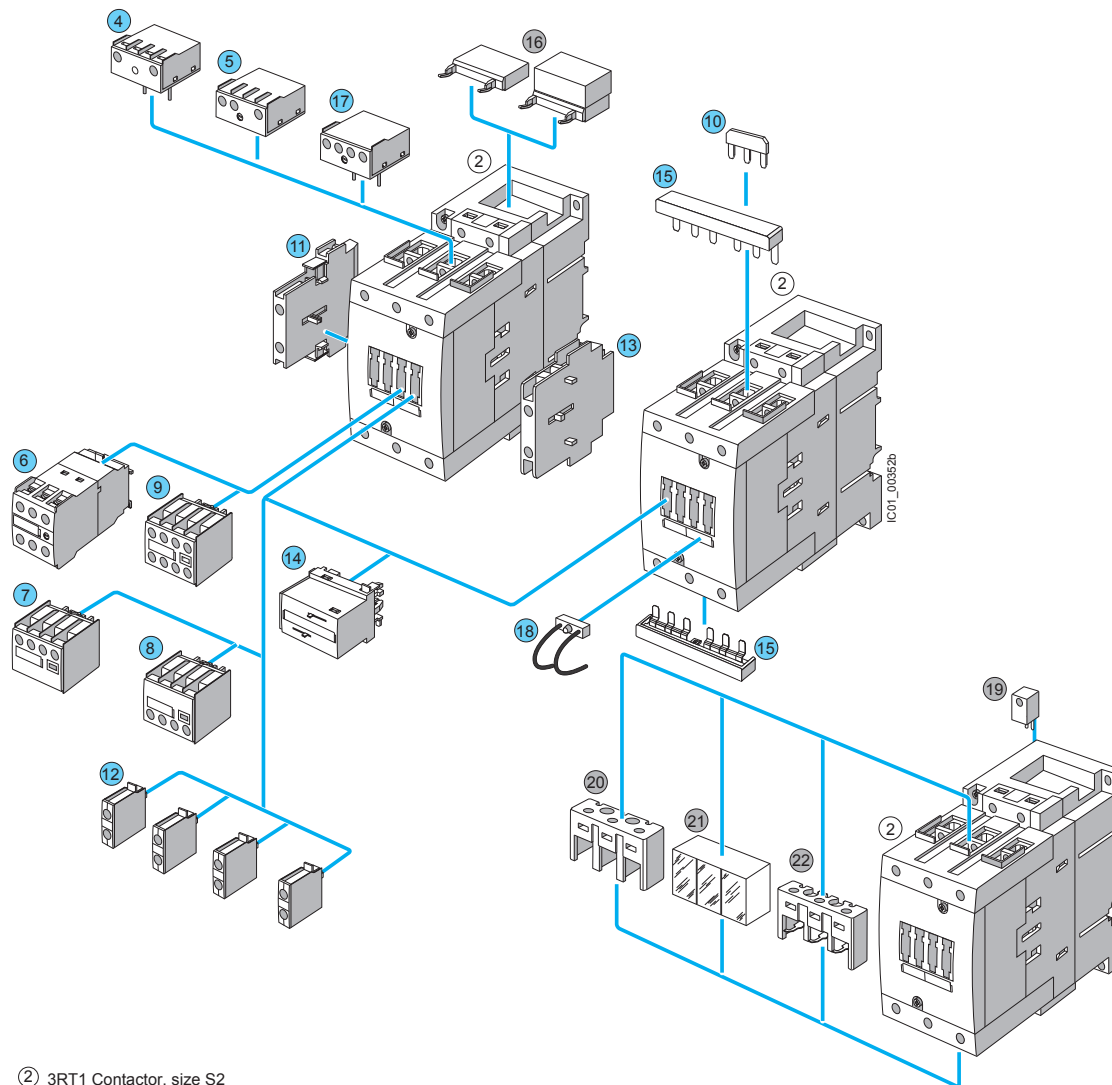
⑭ 3-phase feeder terminal

⑮ Link for paralleling (star jumper), 3-pole, without connection terminal

⑯ Safety main current connector for two contactors

Accessories [see pages 2/66 to 2/81](#).

Size S3 with mountable accessories



- ② 3RT1 Contactor, size S2
- ③ 3RT1 Contactor, size S3

For sizes S2 and S3:

- ④ Electronic timing relay block, ON-delay
- ⑤ Electronic timing relay block, OFF-delay
- ⑥ Auxiliary switch block, solid-state time-delay (ON or OFF-delay or wye-delta function)
- ⑦ 2-pole auxiliary switch block, cable entry from above
- ⑧ 2-pole auxiliary switch block, cable entry from below
- ⑨ 4-pole auxiliary switch block (terminal designations according to EN 50012 or EN 50005)
- ⑩ Link for paralleling (star jumper), 3-pole, without connecting terminal
- ⑪ Link for paralleling, 3-pole, with connecting terminal
- ⑫ 2-pole auxiliary switch block, laterally mountable left or right (terminal designations according to EN 50012 or EN 50005)
- ⑬ Single-pole auxiliary switch block (up to 4 can be snapped on)
- ⑭ Mechanical interlock, laterally mountable
- ⑮ Mechanical interlock, mountable to the front
- ⑯ Wiring connectors on the top and bottom (reversing duty)

- ⑰ Surge suppressor (varistor, RC element, diode assembly), can be mounted on the top or bottom
- ⑱ Mechanical latching interface for mounting directly onto contactor coil
- ⑲ LED module for indicating contactor operation

Only for size S2:

- ⑳ Mechanical latching

Only for sizes S2 and S3:

- ㉑ Coil repeat terminal for making contactor assemblies
- ㉒ Terminal cover for box terminal

Only for size S3:

- ㉓ Terminal cover for cable lug and bar connection
- ㉔ Auxiliary conductor terminal, 3-pole

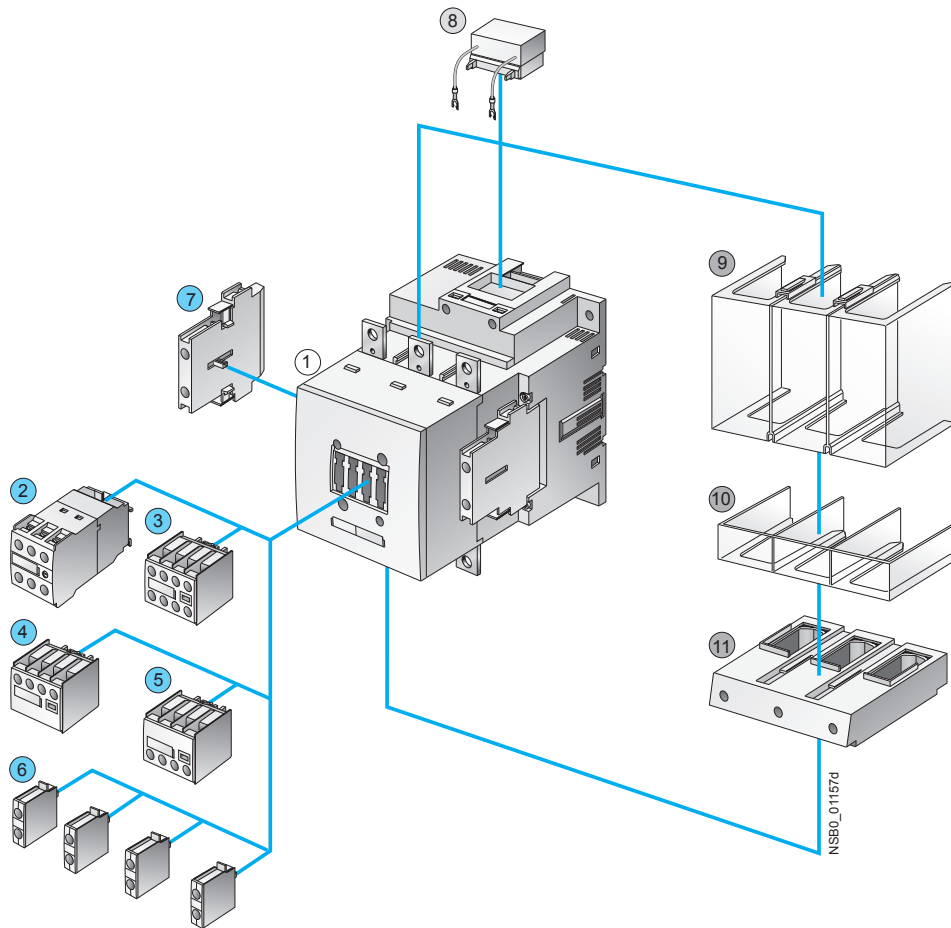
- Accessories identical for sizes S2 and S3
- Accessories differ according to size

Accessories [see pages 2/66 to 2/81](#).

Motor Starters [see Chapter 4 Combination Starters & Starters for group installation](#)

3RT1 contactors
Sizes S6 to S12 with mountable accessories

(illustration for basic unit)



① 3RT10 and 3RT14 air-break contactors, sizes S6, S10 and S12

② Auxiliary switch block, solid-state time-delay
 (ON or OFF-delay or wye-delta function)

③ 4-pole auxiliary switch block
 (terminal designations according to EN 50012 or EN 50005)

④ 2-pole auxiliary switch block, cable entry from above

⑤ 2-pole auxiliary switch block, cable entry from below

⑥ Single-pole auxiliary switch block (up to 4 can be snapped on)

⑦ 2-pole auxiliary switch block, laterally mountable left or right
 (terminal designations according to EN 50012 or EN 50005)
 (identical for S0 to S12)

⑧ Surge suppressor (RC element) for plugging into top of withdrawable coil

⑨ Terminal cover for cable lug and busbar connection,
 different for sizes S6 and S10/S12

⑩ Terminal cover for box terminal, different for
 sizes S6 and S10/S12

⑪ Box terminal block, different for sizes S6 and S10/S12

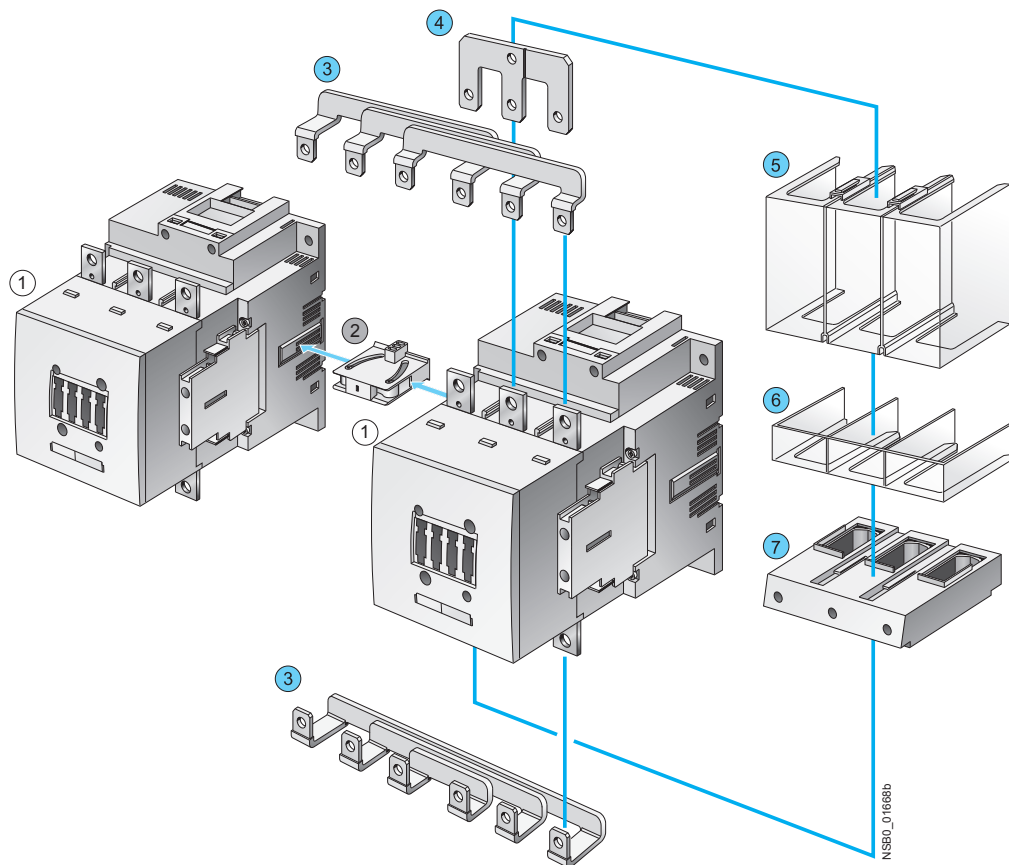
● Accessories identical for sizes S0 to S12

● Accessories identical for sizes S6 to S12

● Accessories differ according to size

For accessories [see pages 2/66 to 2/83](#).

For mountable overload relays [see Chapter 3](#),
 "Overload Relays".



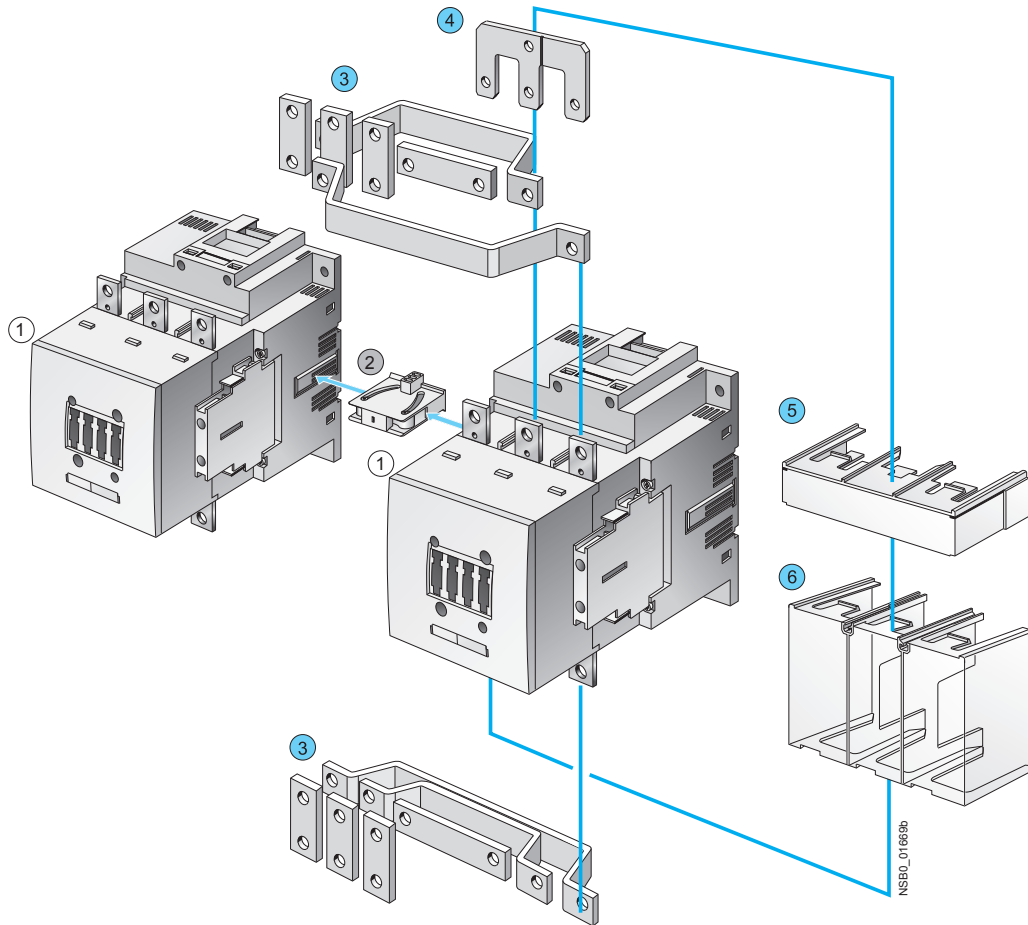
- ① 3RT10 and 3RT14 air-break contactor, size S6
- ② Mechanical interlock, laterally mountable
- ③ Wiring modules on the top and bottom 3RA1953-2A
- ④ Link for paralleling (star jumper), 3-pole, with through-hole, 3RT1956-4BA31
- ⑤ Terminal cover for cable lug and bar connection different for sizes S6 and S10/S12
- ⑥ Terminal cover for box terminal different for sizes S6 and S10/S12
- ⑦ Box terminal block, different for sizes S6 and S10/S12

- Accessories identical for sizes S6 to S12
- Accessories differ according to size

For accessories [see pages 2/66-2/83](#).

Mountable overload relays [see Chapter 3, "Overload Relays"](#).

3RT1 contactors
Sizes S6, S10 and S12 with accessories



① 3RT10 and 3RT14 air-break contactor, sizes S6, S10 and S12 or 3RT12 vacuum contactor, sizes S10 and S12

② Mechanical interlock, laterally mountable

③ Wiring modules on the top and bottom, 3RA19

④ Link for paralleling (star jumper), 3-pole, with through-hole, 3RT19 56-4BA31

⑤ Terminal cover for box terminal, different for sizes S6 and S10/S12

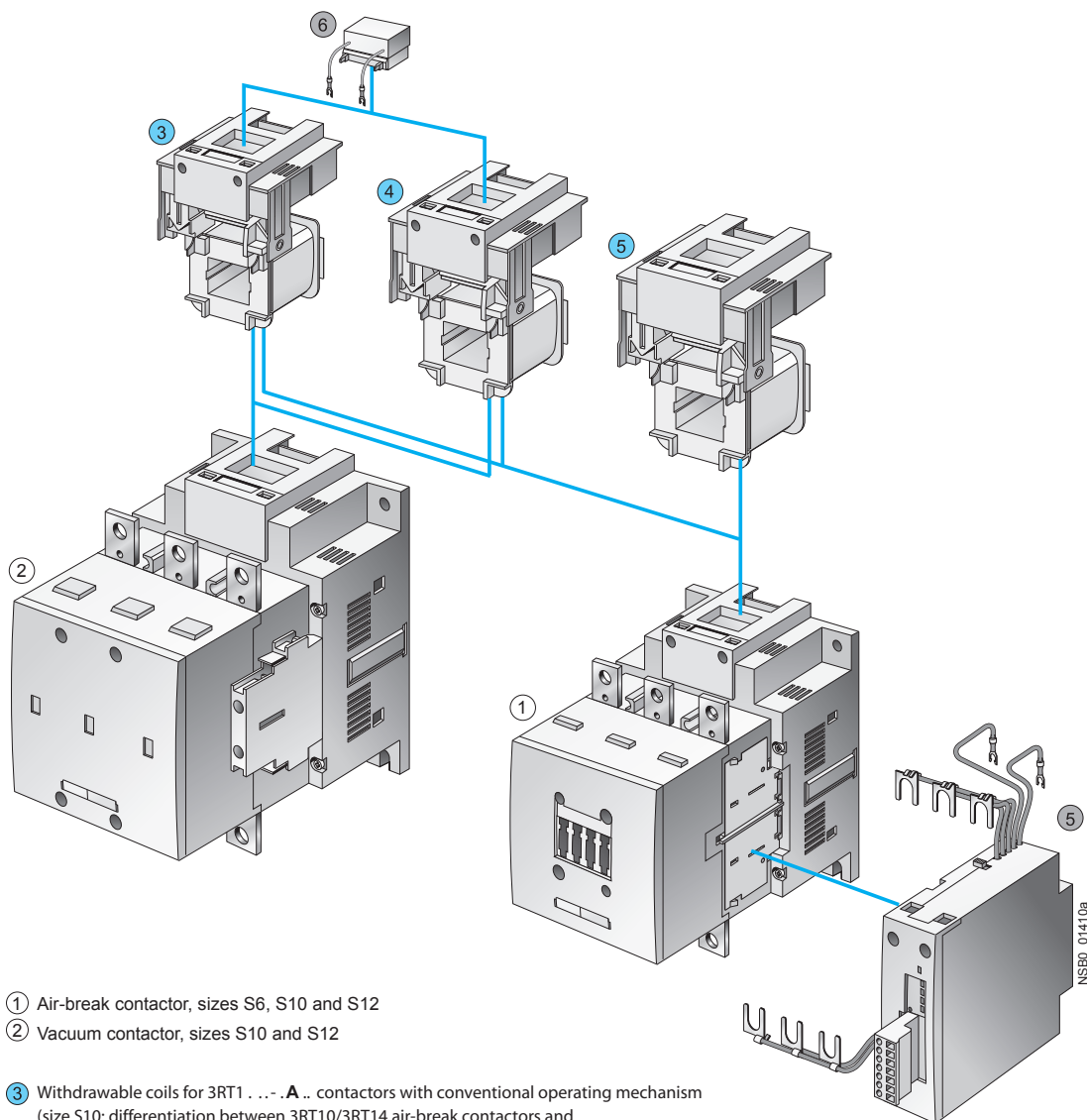
⑥ Terminal cover for cable lug and busbar connection, different for sizes S6 and S10/S12

● Accessories identical for sizes S6 to S12

● Accessories different according to size

For accessories [see pages 2/66-2/83](#).

For mountable overload relays [see Chapter 3](#), "Overload Relays".



① Air-break contactor, sizes S6, S10 and S12

② Vacuum contactor, sizes S10 and S12

③ Withdrawable coils for 3RT1 ...-A.. contactors with conventional operating mechanism
 (size S10: differentiation between 3RT10/3RT14 air-break contactors and 3RT12 vacuum contactors)
 (size S12: the same for air-break and vacuum contactors)

④ Withdrawable coils for 3RT1 ...-N.. contactors with solid-state operating mechanism.
 (size S10: differentiation between 3RT10/3RT14 air-break contactors and 3RT12 vacuum contactors)
 (size S12: the same for air-break and vacuum contactors)

⑤ Withdrawable coils and laterally mountable module (plug-on) for 3RT1 ...-P.. air-break contactors with solid-state operating mechanism and remaining lifetime indicator

⑥ Surge suppressor (RC element), plug-mountable on withdrawable coils
 • 3RT1 ...-A.. with conventional operating mechanism
 • 3RT1 ...-N.. with solid-state operating mechanism

● Identical for sizes S6 to S12

● Different according to size

For surge suppressors [see page 2/73](#),
 withdrawable coils [see page 2/98](#).

For mountable overload relays [see Chapter 3, "Overload Relays"](#).

Contactors and Contactor Assemblies

Accessories for 3RT contactors / 3RH control relays

Auxiliary switch blocks

• Revised •
04/20/15

SIRIUS



Selection and ordering data



3RH2911-1HA01







3RH2911-2HA01



3RH19 21-1HA .



3RH19 21-2HA .

For contactors/ control relays	Rated operational Current ³⁾ 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Connections position	Auxiliary contacts				Screw Terminals ¹⁾	Spring Terminals ¹⁾
				Version					
								Order No.	Order No.
Type				NO	NC	NO	NC		

Auxiliary switch blocks for snapping onto the front according to EN 50012 (also compliant with the requirements according to EN 50005)

Size S00 ²⁾

For assembling contactors with 2, 3, 4, or 5 auxiliary contacts

3RT201., Ident. No. 10E	11E	—	1	—	—	3RH2911-1HA01	3RH2911-2HA01
3RT231.	12E	—	2	—	—	3RH2911-1HA02	3RH2911-2HA02
3RT251.	13E	—	3	—	—	3RH2911-1HA03	3RH2911-2HA03
	21E	1	—	—	—	3RH2911-1HA10	3RH2911-2HA10
	21E	1	1	—	—	3RH2911-1HA11	3RH2911-2HA11
	22E	1	2	—	—	3RH2911-1HA12	3RH2911-2HA12
	23E	1	3	—	—	3RH2911-1HA13	3RH2911-2HA13
	31E	2	—	—	—	3RH2911-1HA20	3RH2911-2HA20
	31E	2	1	—	—	3RH2911-1HA21	3RH2911-2HA21
	32E	2	2	—	—	3RH2911-1HA22	3RH2911-2HA22
	41E	3	—	—	—	3RH2911-1HA30	3RH2911-2HA30
	41E	3	1	—	—	3RH2911-1HA31	3RH2911-2HA31

Size S0 to S2

For assembling contactors with 3, 4, or 5 auxiliary contacts

3RT202., Ident. No. 10E	12E	—	1	—	—	3RH2911-1HA01	3RH2911-2HA01
3RT232.	13E	—	2	—	—	3RH2911-1HA02	3RH2911-2HA02
3RT252.	14E	—	3	—	—	3RH2911-1HA03	3RH2911-2HA03
3RT203.	21E	1	—	—	—	3RH2911-1HA10	3RH2911-2HA10
3RT233.	22E	1	1	—	—	3RH2911-1HA11	3RH2911-2HA11
3RT253.	23E	1	2	—	—	3RH2911-1HA12	3RH2911-2HA12
	24E	1	3	—	—	3RH2911-1HA13	3RH2911-2HA13
	31E	2	—	—	—	3RH2911-1HA20	3RH2911-2HA20
	32E	2	1	—	—	3RH2911-1HA21	3RH2911-2HA21
	33E	2	2	—	—	3RH2911-1HA22	3RH2911-2HA22
	41E	3	—	—	—	3RH2911-1HA30	3RH2911-2HA30
	42E	3	1	—	—	3RH2911-1HA31	3RH2911-2HA31

Auxiliary switch blocks for snapping onto the front according to EN 50012

Sizes S3 to S12

4-pole

3RT1. 4 to	31	3	1	—	—	3RH1921-1HA31	3RH1921-2HA31
3RT1. 7,	22	2	2	—	—	3RH1921-1HA22	3RH1921-2HA22
3RT11.	13	1	3	—	—	3RH1921-1HA13	3RH1921-2HA13
	22	(with location digits 5, 6, 7, 8)	2	2	—	3RH1921-1XA22-0MA0	3RH1921-2XA22-0MA0

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.

For position of the terminals see pages 2/202-2/206.

For int. circuit diagrams see page 2/190.

3RH29 aux blocks are not intended for use with 3RT1 or 3RH1 contactors and relays.

3RH19 aux blocks are not intended for use with 3RT2 or 3RH2 contactors and relays.

For auxiliary switch blocks for 3RH2140 and 3RH2440 see page 2/51.

1) The 3RH2911-1HA.. aux. switches are available with ring-lug terminals. Replace the 8th digit of the Order No. with a "4".

2) Size S00 can be mounted according to EN 50012 only on basic units which have no integrated NC contact.

3) UL ratings: See appendix page 19/7

Selection and ordering data



3RH2911-1FA40



3RH2911-2FA40



3RH19 21-1C...







3RH19 21-2C...



3RH19 21-1LA...



3RH19 21-1MA...

For contactors/ control relays	Rated operational Current ³⁾ 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Connections position	Auxiliary contacts				Screw Terminals ¹⁾	Spring Terminals ¹⁾
				Version					
								Order No.	Order No.
Type				NO	NC	NO	NC		

Auxiliary switch blocks for snapping onto the front according to EN 50005

Sizes S00 to S2

2- or 4-pole auxiliary switch blocks for assembling contactors
with 3 and 5 or 4 and 6 auxiliary contacts

3RT2. 1.,	40	4	—	—	—	3RH2911-1FA40	3RH2911-2FA40
3RT2. 2.,	22	2	2	—	—	3RH2911-1FA22	3RH2911-2FA22
3RT2. 3.,	04 ¹⁾	—	4	—	—	3RH2911-1FA04	3RH2911-2FA04
3RH21 ...,	11 ²⁾	—	—	1	1	3RH2911-1FB11	3RH2911-2FB11
3RH24 ..	22 ²⁾	1	1	1	1	3RH2911-1FB22	3RH2911-2FB22
	22 ²⁾	—	—	2	2	3RH2911-1FC22	3RH2911-2FC22

1- and 2- pole auxiliary switch blocks, cable entry from above or below

3RT2. 1.,	10	Top	1	—	—	—	3RH2911-1AA10	—
3RT2. 2.,		Bottom	1	—	—	—	3RH2911-1BA10	—
3RT2. 3.,	01	Top	—	1	—	—	3RH2911-1AA01	—
3RH21 ...,		Bottom	—	1	—	—	3RH2911-1BA01	—
3RH24 ..	11	Top	1	1	—	—	3RH2911-1LA11	—
		Bottom	1	1	—	—	3RH2911-1MA11	—
	20	Top	2	—	—	—	3RH2911-1LA20	—
		Bottom	2	—	—	—	3RH2911-1MA20	—

Sizes S3 to S12

4-pole auxiliary switch blocks

3RT1. 4 to	40	4	—	—	—	3RH1921-1FA40	3RH1921-2FA40
3RT1. 7,	31	3	1	—	—	3RH1921-1FA31	3RH1921-2FA31
3RT11	22	2	2	—	—	3RH1921-1FA22	3RH1921-2FA22
	04	—	4	—	—	3RH1921-1FA04	3RH1921-2FA04
	22 U	—	—	2	2	3RH1921-1FC22	3RH1921-2FC22

Single-pole auxiliary switch blocks (also compliant with EN 5001²⁾)

3RT1. 4 to	—	1	—	—	—	3RH1921-1CA10	3RH1921-2CA10
3RT1. 7,	—	—	1	—	—	3RH1921-1CA01	3RH1921-2CA01
3RT11	—	—	—	1	—	3RH1921-1CD10	—
	—	—	—	—	1	3RH1921-1CD01	—

2-pole auxiliary switch blocks with cable entry from one side

3RT1. 4 to	—	Top	1	1	—	—	3RH19 21-1LA11	—
3RT1. 7,	—	Bottom	1	1	—	—	3RH19 21-1MA11	—
3RT11	—	Top	2	—	—	—	3RH19 21-1LA20	—
	—	Bottom	2	—	—	—	3RH19 21-1MA20	—
	—	Top	—	2	—	—	3RH19 21-1LA02	—
	—	Bottom	—	2	—	—	3RH19 21-1MA02	—

EN50005 and EN50012 designate the markings
of the auxiliary terminal numbers.
For position of the terminals see pages 2/202-2/206.
For int. circuit diagrams see page 2/190.

1) Mounting is permitted only on basic units which
have no integrated NC contact.

3) UL ratings: See appendix page 19/7

2) Version with early make and delayed break contacts

Contactors and Contactor Assemblies

Accessories for 3RT contactors / 3RH control relays

Laterally mountable auxiliary switch blocks

• Revised •
04/20/15

SIRIUS



Selection and ordering data



3RH2911-1DA02





3RH2911-2DA02



3RH19 21-1EA..
-1KA..



3RH2921-1DA02

For contactors/ control relays	Rated operational Current ⁴⁾ 6A NEMA A600/Q600	Contactor with HS block Ident. No.	Mountable to contactor/ contactor relay side	Auxiliary contacts		Screw Terminals ¹⁾	Spring Terminals ¹⁾
				Version			
						Order No.	Order No.
Type				NO	NC		

Laterally mountable auxiliary switch blocks according to EN 50012

Laterally mountable auxiliary switch block, 2-pole

Size S00 ^{1) 2)}

3RT201.	A600/Q600	12E	right or left	—	2	3RH2911-1DA02 3RH2911-1DA11	3RH2911-2DA02 3RH2911-2DA11
Ident. No. 10E	A600/Q600	21E	right or left	1	1		

Size S0 to S2

3RT2.2. ³⁾	A600/Q600	13E	right or left	—	2	3RH2921-1DA02 3RH2921-1DA11 3RH2921-1DA20	3RH2921-2DA02 3RH2921-2DA11 3RH2921-2DA20
Ident. No. 11E	A600/Q600	22E	right or left	1	1		
3RT2.3.	A600/Q600	31E	right or left	2	—		

First laterally mountable auxiliary switch block, 2-pole

Sizes S3 to S12

3RT1. 3 to 3RT1. 7	A600/Q600		right or left	1	1	3RH1921-1DA11	3RH1921-2DA11
--------------------	-----------	--	---------------	---	---	----------------------	----------------------

Second laterally mountable auxiliary switch block, 2-pole

Sizes S3 to S12

3RT1. 4 to 3RT1. 7	A300/Q300		right or left	1	1	3RH1921-1JA11	3RH1921-2JA11
--------------------	-----------	--	---------------	---	---	----------------------	----------------------

Laterally mountable auxiliary switch blocks according to EN 50005

First laterally mountable auxiliary switch block, 2-pole

Sizes S00 ^{1) 2)}

3RT2.1.	A600/Q600	02	right or left	—	2	3RH2911-1DA02 3RH2911-1DA11 3RH2911-1DA20	3RH2911-2DA02 3RH2911-2DA11 3RH2911-2DA20
Ident. No. 10E	A600/Q600	11	right or left	1	1		
	A600/Q600	20	right or left	2	—		

Sizes S0 to S2

3RT2.2.,	A600/Q600	02	right or left	—	2	3RH2921-1DA02 3RH2921-1DA11 3RH2921-1DA20	3RH2921-2DA02 3RH2921-2DA11 3RH2921-2DA20
3RT2.3. ³⁾	A600/Q600	11	right or left	1	1		
	A600/Q600	20	right or left	2	—		

Sizes S3 to S12

3RT1. 4 to	A300/Q300		right or left	—	2	3RH1921-1EA02 3RH1921-1EA11 3RH1921-1EA20	3RH1921-2EA02 — 3RH1921-2EA20
3RT1. 7	A300/Q300		right or left	1	1		
	A300/Q300		right or left	2	—		

Second laterally mountable auxiliary switch block, 2-pole

Sizes S3 to S12

3RT1. 4 to	A300/Q300		right or left	—	2	3RH1921-1KA02 3RH1921-1KA11 3RH1921-1KA20	3RH1921-2KA02 — 3RH1921-2KA20
3RT1. 7	A300/Q300		right or left	1	1		
	A300/Q300		right or left	2	—		

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.
For position of the terminals see pages 2/202-2/206.
For int. circuit diagrams see pages 2/190-2/195.

1) With size S00, mounting according to EN 50012 is permitted only on basic units which have no NC contact integrated.

2) Ident. No. 41, 32 and 23 according to EN 50012 is also possible. Please note the corresponding circuit diagrams for mounting 3RH29 11-1DA.. on the left.

3) With 3RT23 2., 3RT25. 2. mountable only on the right.

4) UL ratings: See appendix page 19/7

Selection and ordering data

- Operation in dusty atmospheres
- Solid-state circuits with rated operational currents I_e /AC-14 and DC-13 from 1 ... 300 mA at 3 ... 60 V
- Hard gold-plated contacts
- Mirror contacts according to EN 60947-4-1, Appendix F, for laterally mountable auxiliary switches

Selection and ordering data



3RH2911-1NF02



3RH2911-2NF02



3RH2911-2DE11



3RH1921-2DE11



3RH19 21-2DE11

For contactors/ control relays	Contactor with HS block Ident. No.	Mountable to contactor/ contactor relay side	Auxiliary contacts Version	Screw Terminals ¹⁾	Spring Terminals ¹⁾
				Order No.	Order No.
Type			NO NC NO NC		

Solid-state compatible auxiliary switch blocks for snapping onto the front according to EN 50005¹⁾

Sizes S00 to S2

3RT2. 1., 3RT2.2., 3RT2.3.	02	—	—	—	2	3RH2911-1NF02	3RH2911-2NF02
3RH21 ..., 3RH24 ..	11	1	—	—	1	3RH2911-1NF11	3RH2911-2NF11
	20	2	—	—	—	3RH2911-1NF20	3RH2911-2NF20
Sizes S3 to S12							
3RT1. 4 to 3RT1. 7	—	1	1	1	1	3RH1921-1FE22	3RH19 21-2FE22
	—	—	2	2	—		3RH1921-2FJ22

Solid-state compatible auxiliary switch blocks, laterally mountable, according to EN 50012

First laterally mountable auxiliary switch block, 2-pole

Size S00²⁾

3RT2. 1., Ident. No. 10E	21E	right	1	—	—	1	—	3RH2911-2DE11
-----------------------------	-----	-------	---	---	---	---	---	---------------

Size S0 to S2

3RT2. 2, 3RT2. 3 Ident. No. 10E	22E	right	1	—	—	1	—	3RH2921-2DE11
------------------------------------	-----	-------	---	---	---	---	---	---------------

Sizes S3 to S12

3RT1. 4 to 3RT1. 7		right or left	1	—	—	1	—	3RH1921-2DE11
-----------------------	--	---------------	---	---	---	---	---	---------------

Second laterally mountable auxiliary switch block, 2-pole

Sizes S3 to S12

3RT1. 4 to 3RT1. 7		right or left	1	—	—	1	—	3RH1921-2JE11
-----------------------	--	---------------	---	---	---	---	---	---------------

Solid-state compatible auxiliary switch blocks, laterally mountable, according to EN 50005

Size S00

3RT2. 1., Ident. No. 10E	11	right or left	1	—	—	1	—	3RH2911-2DE11
-----------------------------	----	---------------	---	---	---	---	---	---------------

Size S0 to S2

3RT2. 2., 3RT2. 3	11	right or left	1	—	—	1	—	3RH2921-2DE11
----------------------	----	---------------	---	---	---	---	---	---------------

EN50005 and EN50012 designate the markings of the auxiliary terminal numbers.
For position of the terminals see pages 2/202-2/206.
For int. circuit diagrams see pages 2/190-2/195.

1) The 3RH29 11-.NF.. auxiliary switches are also available with ring lug terminal connection. The 8th digit of the order number must be replaced with "4", e. g.: 3RH2911-1NF11 -> 3RH2911-4NF11

2) Size S00 can be mounted according to EN 50012 only on basic units which have no integrated NC contact.

Contactors and Contactor Assemblies



Accessories for 3RT contactors / 3RH control relays

Auxiliary switch blocks, delayed

• Revised •
04/20/15



Selection and ordering data

	For contactors	Rated control supply voltage U_s ¹⁾	Time setting range t	Output / auxiliary contacts	Screw Terminals Order No.	Spring Terminals Order No.
	Type	V	Sec			
Time-delay, solid-state auxiliary switch blocks for snapping onto the front according to DIN 46199-5						
The electrical connection between the solid-state time-delay auxiliary switch and the contactor underneath is established automatically when it is snapped on and locked into place.						
Sizes S00 to S2						
	3RA2813-1AW10 3RT2., 3RH21 ²⁾ 3RH24	ON-delay (varistor integrated)				
		24 ... 240 AC/DC	0.05 ... 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	3RA2813-1AW10 3RA2813-1FW10	3RA2813-2AW10 3RA2813-2FW10
		OFF-delay with auxiliary voltage (varistor integrated)				
		24 ... 240 AC/DC	0.05 ... 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	3RA28 14-1AW10 3RA28 14-1FW10	3RA28 14-2AW10 3RA28 14-2FW10
		OFF-delay without auxiliary voltage ³⁾ (varistor integrated)				
		24 ... 240 AC/DC	0.05 ... 100 (1, 10, 100, selectable)	1 CO 1 NO + 1 NC	3RA2815-1AW10 3RA2815-1FW10	3RA2815-2AW10 3RA2815-2FW10
Sizes S3 to S12						
	3RT1926-2FJ11 3RT10, 3RT13, 3RT14, 3RT15	ON-delay (varistor integrated)				
		24 AC/DC ⁴⁾	0.05 ... 1 0.5 ... 10 5 ... 100	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	3RT19 26-2EJ11 3RT19 26-2EJ21 3RT19 26-2EJ31	— — —
		100 ... 127 AC ⁴⁾	0.05 ... 1 0.5 ... 10 5 ... 100	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	3RT19 26-2EC11 3RT19 26-2EC21 3RT19 26-2EC31	— — —
		200 ... 240 AC ⁴⁾	0.05 ... 1 0.5 ... 10 5 ... 100	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	3RT19 26-2ED11 3RT19 26-2ED21 3RT19 26-2ED31	— — —
		OFF-delay without auxiliary voltage ⁵⁾				
		24 AC/DC ⁴⁾	0.05 ... 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	3RT19 26-2FJ11 3RT19 26-2FJ21 3RT19 26-2FJ31	— — —
		100 ... 127 AC ⁴⁾	0.05 ... 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	3RT19 26-2FK11 3RT19 26-2FK21 3RT19 26-2FK31	— — —
		200 ... 240 AC ⁴⁾	0.05 ... 100 (1, 10, 100, selectable)	1 NO + 1 NC 1 NO + 1 NC 1 NO + 1 NC	3RT19 26-2FL11 3RT19 26-2FL21 3RT19 26-2FL31	— — —
		WYE-delta function				
		24 AC/DC ⁴⁾	1.5 ... 30	each have:	3RT19 26-2GJ51	—
		100 ... 127 AC ⁴⁾	1.5 ... 30	1 NO delayed	3RT19 26-2GC51	—
		200 ... 240 AC ⁴⁾	1.5 ... 30	1 NO instant interval 50ms	3RT19 26-2GD51	—

For technical data, see pages 2/182-2/183.
For int. circuit diagrams, see page 2/198.
For position of terminals, see page 2/206.

When the solid-state time-delay auxiliary switches are used, no other auxiliary switches are allowed to be mounted on the basic units.

1) AC voltage values apply for 50 Hz and 60 Hz.

2) Cannot be fitted onto coupling relays.

3) Setting of output contacts in as-supplied state not defined (bistable relay). Application of the control supply voltage once results in contact change-over to the correct setting.

4) Terminals A1 and A2 for the rated control supply voltage of the solid-state time-delay auxiliary switch must be connected to the associated contactor by means of connecting leads.

5) Position of the output contacts not defined in the as-delivered state (bistable relay). Applying the control voltage once results in the contacts switching to the correct position.



Selection and ordering data



3RA2812-1DW10



3RA2811-2CW10

For contactors	Rated control supply voltage U_g ¹⁾	Time setting range t	Screw terminals 	Spring-type terminals 	Weight
Type	V AC/DC	s	Order No.	Order No.	kg

Timing relays for mounting on 3RT2 contactors

Sizes S00 to S2

The electrical connection between the timing relay and the contactor underneath is established automatically when it is snapped on and locked.

ON-delay

Two-wire design, varistor integrated

3RT20..., 3RT23..., 3RT25, 3RH21 ²⁾ , 3RH24	24 ... 240	0.05 ... 100 (1, 10, 100; selectable)	3RA2811-1CW10	3RA2811-2CW10
3RT203.	24 ... 90 90 ... 240	0.05 ... 100 (1, 10, 100; selectable)	3RA2831-1DG10 3RA2831-1DH10	3RA2831-2DG10 3RA2831-2DH10
OFF-delay with control signal Varistor integrated				
3RT20..., 3RT23..., 3RT25, 3RH21 ²⁾ , 3RH24	24 ... 240	0.05 ... 100 (1, 10, 100; selectable)	3RA2812-1DW10	3RA2812-2DW10
3RT203.	24 ... 90 90 ... 240	0.05 ... 100 (1, 10, 100; selectable)	3RA2832-1DG10 3RA2832-1DH10	3RA2832-2DG10 3RA2832-2DH10

¹⁾ AC voltage values apply for 50 Hz and 60 Hz.

²⁾ Cannot be fitted onto coupling relays.

For description, see page 2/119.
For technical data, see page 2/182.
For circuit diagrams, see page 2/198.

¹⁾ AC voltage ratings apply for 50 and 60 Hz.

²⁾ The 3RA28 time-delay blocks are available with spring-type terminals. Replace the 8th digit of the order number with a "2".

³⁾ Cannot be fitted onto coupling relays

Contactors and Contactor Assemblies

Accessories for 3RT contactors / 3RH control relays

Function modules, delay blocks,
and mechanical latching blocks

• Revised •
04/20/15

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Selection and ordering data

	For contactors	Rated control supply voltage U_s ¹⁾	Time setting range t	Screw Terminals ²⁾ Order No.	Weight approx. kg
	Type	V	sec		
Solid-state time-delay blocks with semiconductor output					
	Size S3 For mounting on the terminals on top of the contactors				
	ON-delay (varistor integrated)				
	3RT104, 3RT13 ⁵⁾ , 3RT15	24 ... 66 AC/DC	0.05 ... 1	3RT1926-2CG11	0.035
			0.5 ... 10	3RT1926-2CG21	0.035
			5 ... 100	3RT1926-2CG31	0.035
		90 ... 240 AC/DC	0.05 ... 1	3RT1926-2CH11	0.035
			0.5 ... 10	3RT1926-2CH21	0.035
			5 ... 100	3RT1926-2CH31	0.035
	Off-delay with auxiliary voltage (varistor integrated)				
	3RT104, 3RT13 ⁵⁾ , 3RT15	24 ... 66 AC/DC	0.05 ... 1	3RT1926-2DG11	0.037
	Sizes S00 to S2				
	For contactors with DC operation. Non-adjustable delay time				
	3RT2., 3RH2. ...-1BF40	110 AC/DC	S00: > 0.1 S0: > 0.08; S2: > 0.25	3RT2916-2BK01	0.150
	3RT2., 3RH2. ...-1BM40	220 ... 230 AC/DC	S00: > 0.5 S0: > 0.3; S2: > 0.8	3RT2916-2BL01	0.150
	3RT2., 3RH2. ...-1BB40	24 DC	S00: > 0.2 S0: > 0.1; S2: > 0.1	3RT2916-2BE01	0.150
	Sizes S3				
	3RT1. 4	24 DC	S3: 70 fixed	3RT1916-2BE01	0.093
	Size S0				
	For snapping onto the front of contactors ⁵⁾ Auxiliary contacts 1 NO and 1 NC				
	With ON-delay	—	0.1 ... 30 1 ... 60	3RT2926-2PA01 3RT2926-2PA11	0.080 0.080
	With OFF-delay	—	0.1 ... 30 1 ... 60	3RT2926-2PR01 3RT2926-2PR11	0.080 0.080
Mechanical latching blocks					
	For mounting onto the front of contactors				
	The contactor remains in the energized state even after voltage failure				
	Size S0				
	3RT2. 2	24 AC/DC 110 AC/DC 230 AC/DC	— — —	3RT2926-3AB31 3RT2926-3AF31 3RT2926-3AP31	0.100 0.100 0.100

For description, see page 2/119.
For technical data, see page 2/182.
For circuit diagrams, see page 2/198.

- 1) AC voltage ratings apply for 50 and 60 Hz.
- 2) The 3RA28 time-delay blocks are available with spring-type terminals. Replace the 8th digit of the order number with a "2".
- 3) Cannot be fitted onto coupling relays
- 4) Versions according to DIN VDE 0116 on request.
- 5) In addition to these, no other auxiliary contacts are permitted.

Selection and ordering data

For contactors	Version	Rated control supply voltage U_s ¹⁾		Order No.	Weight
		AC operation	DC operation		
Type		V AC	V DC		kg

Surge suppressors without LED (also for spring-type terminals)

Size S00



3RT2916-1B.00

For plugging onto the front side of the contactors (with and without auxiliary switch block)					
3RT2.1, 3RH2.	Varistors	24 ... 48	24 ... 70	3RT2916-1BB00 3RT2916-1BC00 3RT2916-1BD00 3RT2916-1BE00 3RT2916-1BF00	
		48 ... 127	70 ... 150		
		127 ... 240	150 ... 250		
		240 ... 400	--		
		400 ... 600	--		
3RT2.1, 3RH2.	RC elements	24 ... 48	24 ... 70	3RT2916-1CB00 3RT2916-1CC00 3RT2916-1CD00 3RT2916-1CE00 3RT2916-1CF00	
		48 ... 127	70 ... 150		
		127 ... 240	150 ... 250		
		240 ... 400	--		
		400 ... 600	--		
3RT2.1, 3RH2.	Noise suppression diodes	--	12 ... 250	3RT2916-1DG00	
3RT2.1, 3RH2.	Diode assemblies (diode and Zener diode) for DC operation	--	12 ... 250	3RT2916-1EH00	

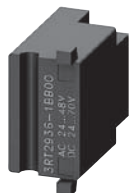
Size S0



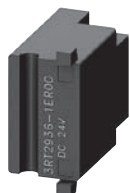
3RT2926-1E.00

For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)					
3RT2.2	Varistors	24 ... 48	24 ... 70	3RT2926-1BB00 3RT2926-1BC00 3RT2926-1BD00 3RT2926-1BE00 3RT2926-1BF00	
		48 ... 127	70 ... 150		
		127 ... 240	150 ... 250		
		240 ... 400	--		
		400 ... 600	--		
3RT2.2	RC elements	24 ... 48	24 ... 70	3RT2926-1CB00 3RT2926-1CC00 3RT2926-1CD00 3RT2926-1CE00 3RT2926-1CF00	
		48 ... 127	70 ... 150		
		127 ... 240	150 ... 250		
		240 ... 400	--		
		400 ... 600	--		
3RT2.2	Diode assembly for DC operation	--	24	3RT2926-1ER00	
		--	30 ... 250	3RT2926-1ES00	

Size S2



3RT2936-1B.00



3RT2936-1E.00

For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)					
3RT2.3.	Varistors	24 ... 48	24 ... 70	3RT2936-1BB00 3RT2936-1BC00 3RT2936-1BD00 3RT2936-1BE00 3RT2936-1BF00	
		48 ... 127	70 ... 150		
		127 ... 240	150 ... 250		
		240 ... 400	--		
		400 ... 600	--		
3RT2.3.	RC elements	24 ... 48	24 ... 70	3RT2936-1CB00 3RT2936-1CC00 3RT2936-1CD00 3RT2936-1CE00 3RT2936-1CF00	
		48 ... 127	70 ... 150		
		127 ... 240	150 ... 250		
		240 ... 400	--		
		400 ... 600	--		
3RT2.3.	Diode assembly for DC operation	--	24	3RT2936-1ER00	
		--	30 ... 250	3RT2936-1ES00	

¹⁾ Can be used for AC operation for 50/60 Hz.
Please inquire about further voltages.

Contactors and Contactor Assemblies





Accessories for 3RT contactors / 3RH control relays

Surge suppressors

• Revised •
04/20/15



Selection and ordering data

	For contactors	Version	Rated control supply voltage U_s 1) AC operation DC operation			Order No.	Weight approx. kg
	Type		V AC	V DC	mW		
Surge suppressors without LED (also for spring-type terminals)							
	3RT1926-1B.00	Sizes S3	For plugging onto coil terminals on the top or bottom				
	3RT1. 4	Varistor	24 ... 48	24 ... 70		3RT1926-1BB00	0.01
			48 ... 127	70 ... 150		3RT1926-1BC00	0.01
			127 ... 240	150 ... 250		3RT1926-1BD00	0.01
			240 ... 400	—		3RT1926-1BE00	0.01
			400 ... 600	—		3RT1926-1BF00	0.01
	3RT1. 4	RC element	24 ... 48	24 ... 70		3RT1936-1CB00	0.01
			48 ... 127	70 ... 150		3RT1936-1CC00	0.01
			127 ... 240	150 ... 250		3RT1936-1CD00	0.01
			240 ... 400	—		3RT1936-1CE00	0.01
	3RT1. 4	Diode assembly for DC operation	—	—			
		• For plugging onto top (e. g. for contactors with overload relay)		24		3RT1936-1ER00	0.01
				30 ... 250		3RT1936-1ES00	0.01
		• For plugging onto bottom (e. g. for fuseless motor starters)		24		3RT1936-1TR00	0.01
				30 ... 250		3RT1936-1TS00	0.01
	3RT1936-1C.00	Sizes S6, S10, S12	For plugging onto the conventional or solid-state coil				
	3RT1. 5, 3RT1. 6 3RT1. 7	RC element	24 ... 48	24 ... 70		3RT1956-1CB00	0.03
			48 ... 127	70 ... 150		3RT1956-1CC00	0.03
			127 ... 240	150 ... 250		3RT1956-1CD00	0.03
			240 ... 400	—		3RT1956-1CE00	0.03
		400 ... 600	—		3RT1956-1CF00	0.03	
Surge suppressors with LED (also for spring-type terminals)							
	3RT2916-1J.00	Size S00	For plugging onto the front side of the contactors (with and without auxiliary switch block)				
	3RT2.1, 3RH2.	Varistor	24 ... 48	12 ... 24	10 ... 120	3RT2916-1JJ00	0.010
			48 ... 127	24 ... 70	20 ... 470	3RT2916-1JK00	0.010
			127 ... 240	70 ... 150	50 ... 700	3RT2916-1JL00	0.010
			—	150 ... 250	160 ... 950	3RT2916-1JP00	0.010
	3RT2.1, 3RH2.	Noise suppression diode	—	24 ... 70	20 ... 470	3RT2916-1LM00	0.010
			—	50 ... 150	50 ... 700	3RT2916-1LN00	0.010
			—	150 ... 250	160 ... 950	3RT2916-1LP00	0.010
	3RT2926-1MR00	Size S0	For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)				
	3RT2. 2	Varistor	24 ... 48	12 ... 24	10 ... 120	3RT2926-1JJ00	0.010
			48 ... 127	24 ... 70	20 ... 470	3RT2926-1JK00	0.010
			127 ... 240	70 ... 150	50 ... 700	3RT2926-1JL00	0.010
	3RT2. 2	Diode assembly	—	24	20 ... 470	3RT2926-1MR00	0.010
	3RT2936-1J.00	Size S2	For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)				
	3RT2.3.	Varistor	24 ... 48	12 ... 24	10 ... 120	3RT2936-1JJ00	0.010
			48 ... 127	24 ... 70	20 ... 470	3RT2936-1JK00	0.010
			127 ... 240	70 ... 150	50 ... 700	3RT2936-1JL00	0.010

1) Can be used for AC operation for 50/60 Hz.
Please inquire about further voltages.

Selection and ordering data

For contactors	Version	Order No.	Weight approx. kg
Units			
Main conducting path surge suppression module for 3RT12 vacuum contactors			
Sizes S10 and S12 3RT12	For damping overvoltages and protecting the motor windings against multiple reignition when switching off three-phase motors. For connection on the contactor feeder side (2-T1/4-T2/6-T3). For separate installation. Rated operational voltage $U_e \geq 500$ V AC ... ≤ 690 V AC Rated operational voltage $U_e \leq 1000$ V AC	3RT1966-1PV3 3RT1966-1PV4	0.18 0.36
Auxiliary conductor terminal, 3-pole			
3RT1946-4F	Size S3 3RT104.	For connecting auxiliary and control leads to the main conductor terminals (for one side).	3RT1946-4F
Blank Labels			
3RT19 00- 1SB20	Unit labeling plates 20 mm x 7 mm, pastel PC labeling system for individual inscription of unitlabeling plates available from: murplastik Systems, Inc.	340 units	3RT19 00- 1SB20 0.200
	10 mm x 7 mm	816 units	3RT1900-1SB10 0.294

Links for paralleling



3RT1916-4BB31



3RT1916-4BB41



3RT1936-4BB31



3RT1956-4BA31

Size	For contactors	Maximum resistive current I_e /AC-1 (at 60 °C) of contactors	Max. conductor cross sections	Screw Terminals	Standard package quantity	Weight approx. kg
	Type	A		Order No.		
S00	3RT201.	3-pole, with terminal 1), 2)	4 AWG, stranded	3RT1916-4BB31		0.015
S0	3RT202.		0 AWG, stranded	3RT2926-4BB31		0.042
S2	3RT203.		95 mm ²	3RT1936-4BB31		0.139
S3	3RT104.	3-pole, with through hole	185 mm ²	3RT1946-4BB31		0.205
S6	3RT1. 5	(WYE jumpers) 1), 2)	—	3RT1956-4BA31		0.159
S10/S12	3RT1. 6 3RT1. 7		—	3RT1966-4BA31		0.541
S00	3RT231. 3RT251.	4-pole, with terminal 1), 2)	4 AWG, stranded	3RT1916-4BB41		0.016

1) Can be used for AC operation for 50/60 Hz.
Please inquire about further voltages.

Contactors and Contactor Assemblies

Accessories for 3RT contactors / 3RH control relays

Other function blocks, PLC control,
load modules, control kit

• Revised •
04/20/15



Selection and ordering data

For contactors Version
Type

Order No.

Weight

EMC suppression modules; 3-phase, up to 10 HP

Size S00 (for contactors with AC or DC operation)



3RT2916-1PA

3RT201

RC elements (3 x 220 Ω/0.22 μF)

Up to 400 V
Up to 575 V
Up to 690 V

3RT201

Varistors

Up to 400 V
Up to 575 V
Up to 690 V

Screw terminals



3RT2916-1PA1
3RT2916-1PA2
3RT2916-1PA3

3RT2916-1PB1
3RT2916-1PB2
3RT2916-1PB3

Coupling links for control by PLC

Size S0

3RT2. 2

For mounting onto the coil terminals of the contactors (only for contactors with screw terminals)

With LED for indicating switching state.
With integrated varistor for damping opening surges.

24 V DC control,
17 ... 30 V DC operating range



3RH2924-1GP11

3RH2924-1GP11

Sizes S00 to S2

3RT2. 1,
3RT2. 2,
3RT2. 3

For mounting on the front side of contactors with AC, DC or AC/DC operation

24 V DC control,
17 ... 30 V DC operating range



3RH2914-1GP11

3RH2914-1GP11

Spring-type terminals



3RH2914-2GP11

Additional load modules

Size S00

3RT2. 1,
3RH2.

For plugging onto the front side of the contactors with or without auxiliary switch blocks

For increasing the permissible residual current and for limiting the residual voltage. It ensures the safe opening of contactors with direct control via 230 V AC semiconductor outputs of SIMATIC controllers. It acts simultaneously as a surge suppressor.

Rated voltage:
50/60 Hz, 180 to 255 V AC



3RT2916-1GA00

3RT2916-1GA00

LED module for indicating contactor operation

Sizes S00 to S2

3RT2..

For snapping into the location hole of an inscription label on the front of a contactor

either directly on the contactor or on the front auxiliary switch. The LED module is connected to coil terminals A1 and A2 of the contactor and indicates its energized state. Yellow LED.

Rated voltage:
24 ... 240 V AC/DC, with reverse polarity protection.



3RT2926-1QT00

3RT2926-1QT00

Control kit

Sizes S00 to S2

For manual operation of the contactor contacts for start-up and service



3RT2916-4MC00

3RT2. 1,
3RH2.
3RT2. 2
3RT2. 3

3RT2916-4MC00

3RT2926-4MC00
3RT2936-4MC00

Selection and ordering data





For contactors Type	Version	Order No.	Weight
Sealable covers			
Sizes S00 to S2			
	3RT2.1, 3RT2.2, 3RT2.3, 3RH2.1)	Sealable covers for preventing manual operation (Not suitable for coupling relays)	3RT2916-4MA10
3RT2916-4MA10			
Connection modules for contactors with screw terminals			
Sizes S00 and S0			
	3RT2.1, 3RH2.	Adapters for contactors Ambient temperature $T_{U\max} = 60\text{ °C}$ Size S00, rated operational current I_e at AC-3/400 V: 20 A	Screw terminals 
3RT1926-4RD01	3RT2.2	Size S0, rated operational current I_e at AC-3/400 V: 25 A	3RT1916-4RD01
	3RT2.1, 3RT2.2, 3RH2.	Plugs for contactors Size S00, S0	3RT1926-4RD01
3RT1900-4RE01			3RT1900-4RE01
Terminal covers for contactors with box terminals			
Size S2			
	3RT203 3RT233, 3RT253	Covers for box terminals For 3-pole contactors For 4-pole contactors (see Chapter 4)	3RT2936-4EA2
3RT2936-4EA2			3RT2936-4EA4
Coil connection modules			
Sizes S0 and S2			
	3RT2.2, 3RT2.3	Connection from top Connection from below Connection diagonally	3RT2926-4RA11
3RT2926-4RA11			3RT2926-4RB11
			3RT2926-4RC11
	3RT2.2	Connection from top Connection from below	Spring-type terminals 
3RT2926-4RA12			3RT2926-4RA12
			3RT2926-4RB12
Covers for contactors with ring cable lug connections			
Size S00			
	3RT2.1, 3RH2	Covers for ring terminal lug connections Single covers	Ring terminal lug connections 
3RT2916-4EA13			3RT2916-4EA13
	3RT2.2	Covers for ring terminal lug connections Set for one device, comprising 4 single covers: - 2 x 3RT2926-4EB13 - 2 x 3RV2928-4AA00	3RT2926-4EB13
3RT2926-4EB13			

1) Exception: contactors and contactor relays with auxiliary switch block mounted onto the front.

Terminals, covers, adapters, connectors






• Revised •
04/20/15



For contactors Type	Version	Order No.	Weight
Screw adapters for fixing the contactors			
Sizes S0 and S2			
 NSB0_01470 3RT1926-4P	3RT2.2, 3RT2.3	Screw adapters for easier screw fixing 2 units required per contactor (1 pack contains 10 sets for 10 contactors)	3RT1926-4P
Solder pin adapters for contactors up to 7.5 HP / 12 A			
Size S00, up to 7.5 HP			
 3RT1916-4KA1	3RT2.1, 3RH21	Assembly kit for soldering contactors onto a printed circuit board. For 1 contactor, 1 set is required.	Screw terminals 3RT1916-4KA1
Solder pin adapters for contactors up to 7.5 HP / 12 A with mounted 4-pole auxiliary switch block			
Size S00, up to 7.5 HP			
 3RT1916-4KA2	3RT2.1, 3RH21	Assembly kit for soldering contactors with an auxiliary switch block onto a printed circuit board. For 1 contactor, 1 set is required.	3RT1916-4KA2
Safety main current connectors for 2 contactors			
Sizes S00 to S2			
 3RA2926-1A	3RT2.1 3RT2.2 3RT2.3	For series connection of 2 contactors	3RA2916-1A 3RA2926-1A 3RA2936-1A

1) Exception: contactors and contactor relays with auxiliary switch block mounted onto the front.

Selection and ordering data

For contactors		Design	Order No.	Weight approx. kg.
Size	Type			
Box terminal block for contactors with screw connections				
3RT19 5. -4G		For circular conductors and ribbon cables For connectable cross-sections, see technical data of contactors, page 2/99		
	S3	3RT1. 4	16 mm² / 10 AWG (solid), 70 mm² / 0 AWG (stranded)	3RT19 46-4G
	S6	3RT1. 5 (3RB205)	up to 70 mm² / 2/0 AWG up to 120 mm² / 4/0 AWG	3RT19 55-4G 3RT19 56-4G
	S10, S12	3RT1. 6, 3RT1. 7 (3RB206)	240 mm² - 500 mm² / 500 MCM - 750 MCM with auxiliary conductor connection	3RT19 66-4G
				0.23 0.26 0.64
Covers for contactors with screw connections				
3RT29 36-4EA2		Terminal cover for box terminals		
	S2	3RT20 3	Additional shock-hazard protection for mounting on the box terminals (2 units required per contactor)	3RT29 36-4EA2
	S3	3RT10 4, 3RT14 4		3RT19 46-4EA2
	S6	3RT1. 5	Length: 25 mm	3RT19 56-4EA2
	S10, S12	3RT1. 6, 3RT1. 7	Length: 30 mm	3RT19 66-4EA2
3RT19 46-4EA1		Terminal cover for cable lug and busbar connection		
	S3	3RT10 4, 3RT14 4	For complying with the phase clearances and as shock-hazard protection in the case of a distant box terminal 1) (2 units required per contactor)	3RT19 46-4EA1
	S6	3RT1. 5	Length: 100 mm	3RT19 56-4EA1
	S10, S12	3RT1. 6, 3RT1. 7	Length: 120 mm	3RT19 66-4EA1
			For covering bars between the contactor and 3RB20 overload relay or wiring connector for contactor assemblies	
	S6	3RT1. 5	Length: 27 mm	3RT19 56-4EA3
	S10, S12	3RT1. 6, 3RT1. 7	Length: 42 mm	3RT19 66-4EA3
				0.012 0.016 0.018
Design		Order No.	Package quantity	Weight approx. kg.
Insulation stop for securely holding back the conductor insulation on conductors up to 1 mm² (17 AWG)				
3RT1916-4JA02		Insulation stop strips can be inserted in cable entry of the spring terminal (2 strips per contactor required)		
	• For basic devices S00 (3RT201. or 3RH2.), removable individually		3RT2916-4JA02	20 strips
	• For auxiliary and control circuit on basic devices size S0 and S2 (3RT2.2., 3RT2.3.) and for mountable 3RH29 auxiliary switches, removable in pairs		3RT1916-4JA02	20 strips
				0.005 0.010
Tool for opening spring-type terminals				
3RA2908-1A		Screwdriver for all SIRIUS devices with spring-type terminals Length: approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated		
			3RA2908-1A	1 unit
				0.045

1) Refer to the note on page 2/142, conductor cross-sections.

Contactors and Contactor Assemblies






Contactor Assemblies for Switching Motors

**3RA13, 3RA23 reversing
contactor assemblies**

• Revised •
04/20/15

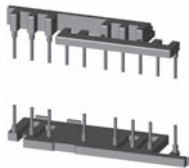
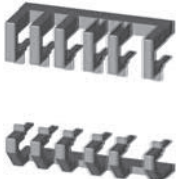

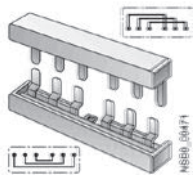
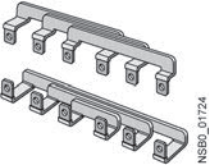
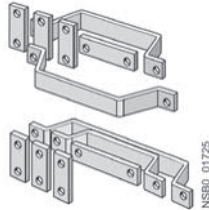


Accessories

	For contactors Type	Size	Design	Order No.	Weight approx. kg
Mechanical interlocks					
	3RA19 24-2B	3RT2.3	S2	laterally mountable for 3RT2 S2 contactors only. There are no NC auxiliary contacts. Use the integrated NC auxiliary on the contactor.	3RA2934-2B 0.04
	3RT104, 3RT134, 3RT144		S3 ¹⁾	laterally mountable each with one auxiliary contact (1 NC) per contactor (can only couple contactors of max. 1 level different size. The mounting depth of the smaller contactor has to be adapted.) Interlock width: 10 mm	3RA19 24-2B 0.05
	3RT10 4;		S3;	front mountable on S3 contactors (for contactors of the same size respectively) Note: Size S3: Use 3RA19 32-2C mechanical connectors.	3RA19 24-1A 0.04
	3RA19 54-2C	3RT104 to 3RT105	S3 to S6	adapter to mechanically interlock a 3RT104 with a 3RT105 includes the adapter and QTY 2 - 3RA1942-2G mechanical connectors requires the 3RA1954 - 2A to be ordered separately Note: Fits 3RT104 AC coil versions only. Does not fit 3RT104 DC coil versions.	3RA19 54-2C
	3RA19 54-2A	3RT1. 5 to 3RT1. 7	S6, S10, S12	laterally mountable without auxiliary contacts; size S6, S10 and S12 contactors can be interlocked with each other as required; no adaptation of mounting depth is necessary. Contactor clearance 10 mm.	3RA19 54-2A 0.02
Repeat coil terminal					
	3RA19 23-3B	3RT10 4	S3	for coil terminals A1 and A2 for reversing starters of size S3 contactors. 2 x A1 and 1 x A2 are required per assembly. (1 set contains 2 x A1 and 1 x A2)	3RA19 23-3B 0.02
Baseplates					
	3RT10 5		S6	for customer mounting of contactor assemblies for reversing	3RA19 52-2A 1.3
	3RT1. 6		S10		3RA19 62-2A 2.4
	3RT1. 7		S12		3RA19 72-2A 2.6

1) Can also be used for size S3 4-pole contactors.

Accessories

	For contactors Type	Size	Details	Screw Terminals Order No.	Spring Terminals Order No.	Pkg. qty.
Assembly kits for making 3-pole contactor assemblies						
	3RT201	S00	The assembly kit contains: Mechanical interlock, 2 connecting clips for 2 contactors, Wiring modules on the top and bottom • For main, auxiliary and control circuits	3RA2913-2AA1	3RA2913-2AA2	1 kit
	3RT202	S0	The assembly kit contains: Mechanical interlock, 2 connecting clips for 2 contactors, Wiring modules on the top and bottom • For main, auxiliary and control circuits ¹⁾ • Only for main circuit ²⁾	3RA2923-2AA1 —	— 3RA2923-2AA2	1 kit 1 kit
	3RT203	S2	The installation kit contains: 2 connecting clips for 2 contactors, Wiring modules on the top and bottom • Only for main circuit ³⁾	3RA2933-2AA1 —	— 3RA2933-2AA2	1 kit 1 kit
	3RT104	S3	The installation kit contains: 2 connecting clips for 2 contactors, Wiring modules on the top and bottom and the mechanical interlock	3RA1943-2A	—	
	3RT105	S6	The installation kit contains: Wiring modules on the top and bottom (for connection with box terminal)	3RA19 53-2A	—	1 kit
	3RT105 3RT1. 6 3RT1. 7	S6 S10 S12	The installation kit contains: Wiring modules on the top and bottom (for connection without box terminals)	3RA1953-2M 3RA1963-2A 3RA1973-2A		1 kit

1) Use of the 3RA2923-2AA1 assembly kit in conjunction with the 3RT202-.....-3MA0 contactors is limited because the auxiliary switches in the basic unit are not allowed to be used on account of the permanently mounted auxiliary switch block.

2) Version in size S0 with spring-type terminals: Only the wiring modules for the main circuit are included. No connectors are included for the auxiliary and control circuit.

3) Version in size S2 with spring-type terminals in the auxiliary and control circuits: Only the wiring modules for the main circuit are included. A cable set is included for the auxiliary circuit.

Contactors and Contactor Assemblies

Contactor Assemblies for Switching Motors










3RA13, 3RA23 reversing
contactor assemblies

• Revised •
09/22/15

SIRIUS



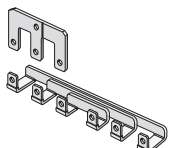
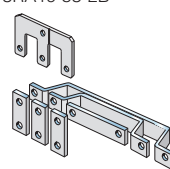
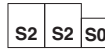
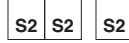
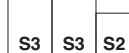
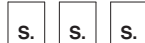
Accessories

	For contactors	Size	Contactor gap for interlock	Version	Screw Terminals Order No.	Spring Terminals Order No.	Pkg. qty.
Wiring modules							
	3RT201	S00- S00	0 mm	Top (in-phase) Bottom (phase reversal)	3RA2913-3DA1 3RA2913-3EA1	3RA2913-3DA2 3RA2913-3EA2	1 1
	3RT202	S0- S0	0 mm	Top (in-phase) Bottom (phase reversal)	3RA2923-3DA1 3RA2923-3EA1	3RA2923-3DA2 3RA2923-3EA2	1 1
	3RT203	S2- S2	10 mm	Top (in-phase) Bottom (phase reversal)	3RA1933-3D 3RA1933-3E	3RA1933-3D 3RA1933-3E	1 1
	3RT104	S3- S3	10 mm	Top (in-phase) Bottom (phase reversal)	3RA1943-3D 3RA1943-3E	— —	1 1
	3RT105	S6- S6	10 mm	Top (in-phase, for connection with box terminal)	3RA1953-3D	—	1
				Top (with phase reversal, for connection without box terminal)	3RA1953-3P	—	1
	For contactors	Size	Contactor gap for interlock	Interlock Type	Version	Order No.	Pkg. qty.
Mechanical connectors¹⁾							
	3RT201	S00- S00	0 mm	Laterally mountable	For 3-pole contactors and 4-pole contactors	3RA2912-2H	1 set
	3RT202	S0- S0	0 mm	Laterally mountable	For 3-pole contactors and 4-pole contactors	3RA2922-2H	1 set
	3RT203	S2- S2	0 mm	Laterally mountable	For 3-pole contactors	3RA2932-2C	5 sets
			10 mm	Laterally mountable	For 3-pole contactors	3RA2932-2D	5 sets
	3RT233			Laterally mountable	For 4-pole contactors	3RA2932-2G	5 sets
	3RT1. 4	S3- S3	0 mm	Mountable on front	For 3-pole contactors	3RA1932-2C	10 sets
			10 mm	Laterally mountable	For 3-pole contactors	3RA1932-2D	10 sets
					For 4-pole contactors	3RA1942-2G	10 sets
	3RT1. 5	S6- S6	10 mm	Laterally mountable	Top (with phase reversal, for connection without box terminal)	3RA1932-2D	10 sets

Note: Standard package quantities may change.
Check Industry Mall for current package quantities.

1) 1 set for 1 contactor. Size S00 & S0: 1 set includes 2 connectors
and 1 interlock. **Size S2: The mechanical interlock must be
ordered separately.** S3-S6: 1 set includes 2 connectors; one
connector for top and one connector for bottom.

Accessories

Design	Sizes	Order No.	Weight approx. kg
Installation kits^{1) 2)}			
 3RA19 53-2B	The installation kit contains: Mechanical interlock, 4 connecting clips, WYE jumper, Wiring connectors on the top and bottom,- For main, auxiliary, and control circuits ³⁾	S00-S00-S00	3RA29 13-2BB1 1 set 0.05
	The installation kit contains: mechanical interlock, 4 connecting clips, WYE jumper, wiring connectors on the top and bottom - For main, auxiliary, and control circuits ³⁾	S0-S0-S0	3RA29 23-2BB1 1 set 0.10
		S2-S2-S0	3RA29 33-2C 1 set 0.16
		S2-S2-S2	3RA29 33-2BB1 0.16
	The installation kit contains: WYE jumper on the top Wiring jumper on the bottom	S3-S3-S2	3RA19 43-2C 0.33
 3RA19 53-2N, 3RA19 63-2B, 3RA19 73-2B		S3-S3-S3	3RA19 43-2B 0.16
		S6-S6-S6	3RA19 53-2B 0.85
	(The wiring connector on the top is not included in the scope of supply. A double infeed between the line contactor and the delta contactor is recommended.)	S6-S6-S6	3RA19 53-2N 0.60
		S10-S10-S10	3RA19 63-2B 1.80
		S12-S12-S12	3RA19 73-2B 2.20
3-phase feeder terminal			
Feeder terminal block for the line contactor for large conductor cross-sections			1 unit
Conductor cross-section: 6 mm ² , 10 AWG	S00	3RA29 13-3K	0.02
Conductor cross-section: 16 mm ² , 6 AWG	S0	3RV29 25-5AB	0.04
Conductor cross-section: 70 mm ² , 2/0 AWG	S2	3RV29 35-5A	0.10
1-phase feeder terminals			
Conductor cross-section: 95 mm ²	S3	3RA19 43-3L	0.280
3-phase busbar			
For in-phase bridging of all input terminals of the line contactor (K1) and the delta contactor (K3)	S0 S2	3RV19 15-1AB 3RV29 35-5E	1 unit 0.03 0.15
Link for paralleling, 3-pole (WYE jumpers)			
3RT19 26-4BA31	Without terminal (the links for paralleling can be reduced by one pole)	S00¹⁾ S0¹⁾ S2 S3 S6⁴⁾ S10, S12⁴⁾	3RT19 16-4BA31 1 unit 0.010 3RT19 26-4BA31 0.020 3RT19 36-4BA31 0.02 3RT19 46-4BA31 0.02 3RT19 56-4BA31 0.15 3RT19 66-4BA31
Baseplates			
For customer assembly of WYE-delta contactor assemblies with a laterally mounted time-delay			1 unit
Side-by-side mounting		3RA29 32-2F	0.45
10 mm clearance between K3 and K2		3RA29 32-2F	0.48
Side-by-side mounting		3RA19 42-2E	0.72
10 mm clearance between K1, K3 and K2	 S6 S6 S3 S6 S6 S6 S10 S10 S6 S10 S10 S10 S12 S12 S10 S12 S12 S12	3RA19 52-2E 3RA19 52-2F 3RA19 62-2E 3RA19 62-2F 3RA19 72-2E 3RA19 72-2F	1 unit 2.0 2.1

1) Size S00, S0 and S2 installation kits for paralleling are available in spring-type terminals. Change the last digit of the order number to a "2".

2) When using the function modules for wye-delta starting, the wiring modules for the auxiliary current are not required. See page 2/45 for more information.

3) Also requires quantity (1) 3RA2816-0EW20 function module set for all control functions. See page 2/45.

4) The 3RT19 56-4EA1 (S6) or 3RT19 66-4EA1 (S10, S12) cover can be used for shock-hazard protection.

Contactors and Contactor Assemblies

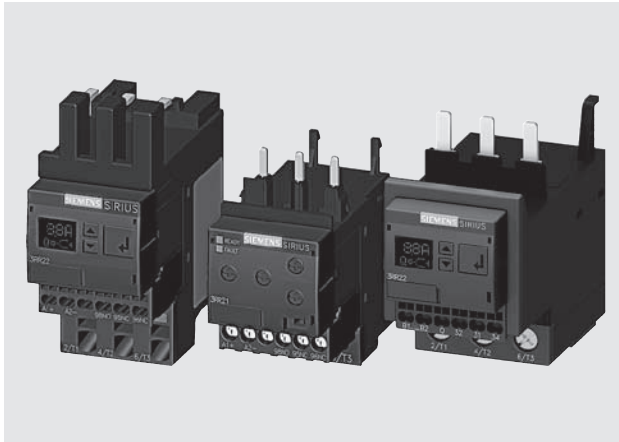
Contactor Assemblies for Switching Motors

Current Monitoring Relays

• Revised •
04/20/15



Overview



SIRIUS 3RR2242, 3RR2142 and 3RR2243 current monitoring relays

The SIRIUS 3RR2 current monitoring relays are suitable for the load monitoring of motors or other loads. In two or three phases they monitor the rms value of AC currents for overshooting or undershooting of set threshold values.

Whereas apparent current monitoring is used above all in connection with the rated torque or in case of overload, the active current monitoring option can be used to observe and evaluate the load factor over a motor's entire torque range.

The 3RR2 current monitoring relays can be integrated directly in the feeder by mounting onto the 3RT2 contactor; separate wiring of the main circuit is therefore superfluous. No separate transformers are required.

For a line-oriented configuration or simultaneous use of an overload relay, terminal supports for stand-alone installation are available for separate standard rail mounting.

Versions

Basic versions

The basic versions with two-phase apparent current monitoring, a CO contact output and analog adjustability provide a high level of monitoring reliability especially in the rated and overload range.

Standard versions

The standard versions monitor the current in three phases with selectable active current monitoring. They have additional diagnostics options such as residual current monitoring and phase sequence monitoring, and they are also suitable for monitoring motors below the rated torque. These devices have an additional independent semiconductor output, an actual value indicator, and are digitally adjustable.

Both versions are available optionally with screw or spring-type terminals, in each case for sizes S00 and S0. With variants of size S2 the main current paths always have screw terminals; the control current side can have screw or spring-type terminals.

Note:

In addition to the features of the standard versions, 3RR24 monitoring relays for mounting onto 3RT2 contactors for IO-Link also offer the possibility of transmitting the measured values and diagnostics data to a controller via an IO-Link. Furthermore, the devices can be parameterized on the devices themselves or via IO-Link.

Benefits

- Can be mounted directly on 3RT2 contactors and 3RA23 reversing contactor assemblies, in other words, there is no need for additional wiring in the main circuit
- Optimally coordinated with the technical characteristics of the 3RT2 contactors
- No separate current transformer required
- Versions with wide voltage supply range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Display of ACTUAL value and status messages
- All versions with removable control current terminals
- All versions with screw terminals or spring-type terminals
- Simple determination of the threshold values through direct reference to actually measured values for setpoint loading
- Range monitoring and selectable active current measurement mean that only one device for monitoring a motor is required along the entire torque curve
- In addition to current monitoring it is also possible to monitor for broken cables, phase failure, phase sequence, residual current and motor blocking

Application

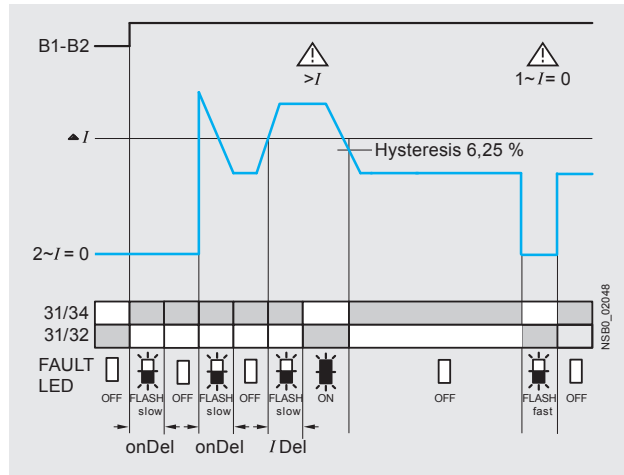
- Monitoring of current overshoot and undershoot
- Monitoring of broken conductors
- Monitoring of no-load operation and load shedding, e.g. in the event of a torn V-belt or no-load operation of a pump
- Monitoring of overload, e.g. on conveyor belts or cranes due to an excessive load
- Monitoring the functionality of electrical loads such as heaters
- Monitoring of wrong phase sequence on mobile equipment such as compressors or cranes
- Monitoring of high-impedance faults to ground, e.g. caused by damaged insulation or moisture

Technical specifications

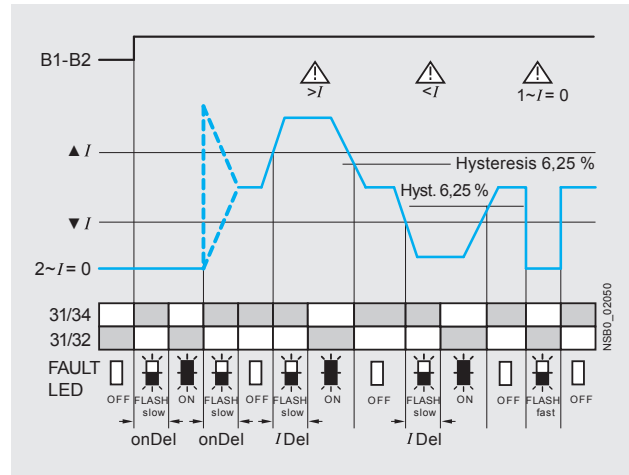
Function charts of 3RR214-..A.30 basic variants, analog dial adjustable

Closed-circuit principle upon application of the control supply voltage

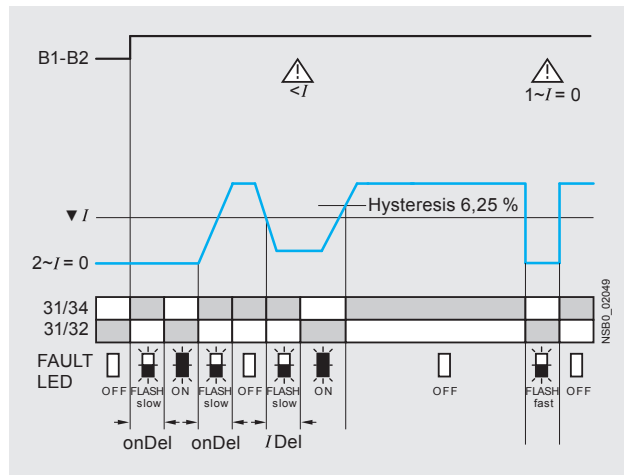
Current overshoot



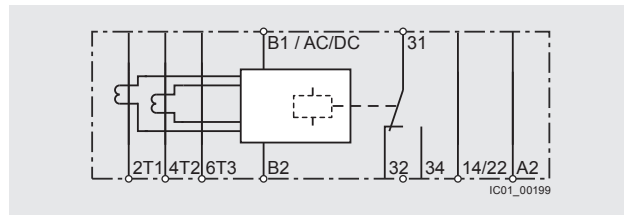
Range monitoring



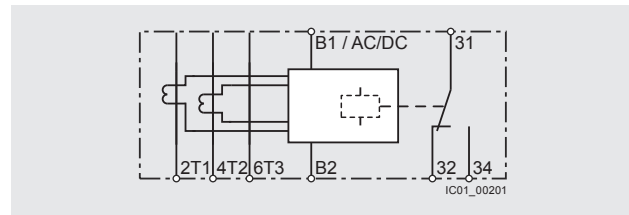
Current undershoot



Circuit diagrams



3RR2141-1A.30



3RR2141-2A.30, 3RR2142-..A.30, 3RR2143-..A.30

Note:

It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

Contactors and Contactor Assemblies

Contactor Assemblies for Switching Motors

Current Monitoring Relays

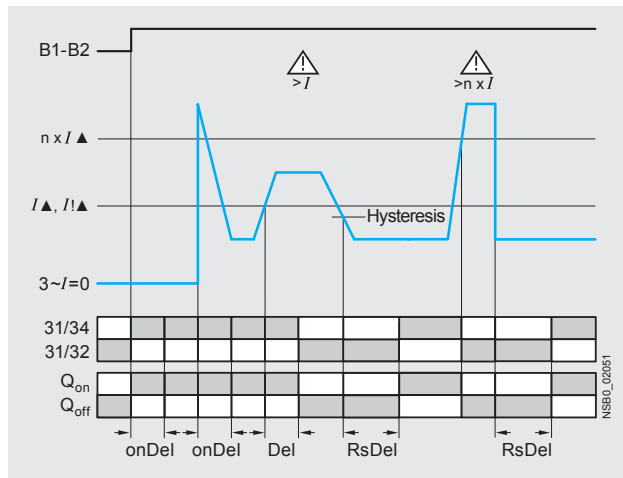
• Revised •
04/20/15



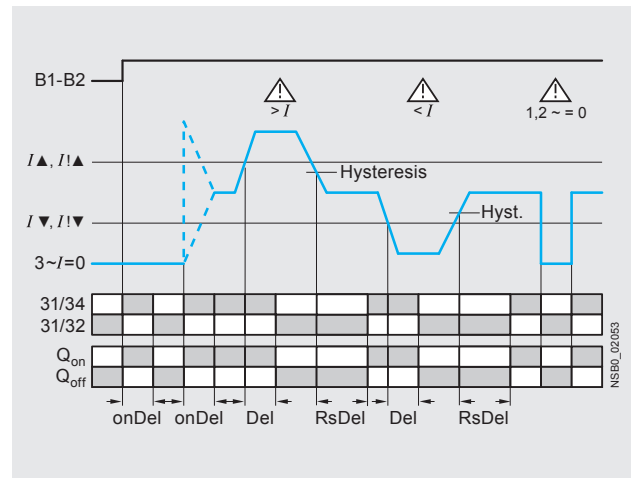
Function charts of 3RR224-..F.30 standard versions, digitally adjustable

With the closed-circuit principle selected upon application of the control supply voltage

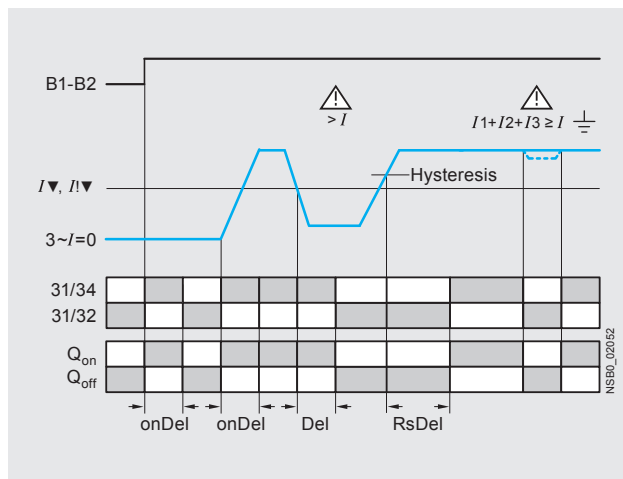
Current overshoot



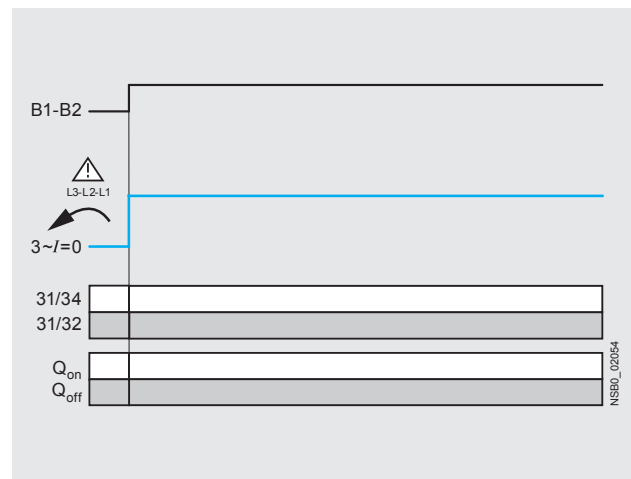
Range monitoring



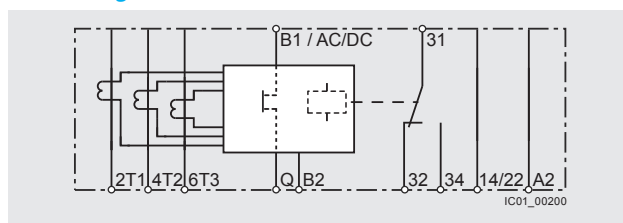
Current undershoot with residual current monitoring



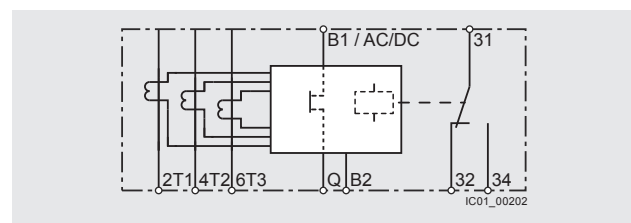
Phase sequence monitoring



Circuit diagrams



3RR2241-1F.30



3RR2241-2F.30, 3RR2242-..F.30, 3RR2243-..F.30

Note:

It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

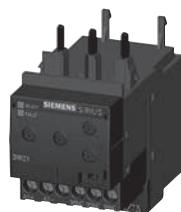
Selection and ordering data

SIRIUS 3RR21/3RR22 current monitoring relays

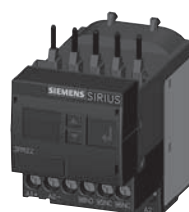
- For load monitoring of motors or other loads
- Multi-phase monitoring of undercurrent and overcurrent
- Starting and tripping delay can be adjusted separately
- Tripping delay 0 to 30 s
- Auto or Manual RESET



3RR2141-1AW30



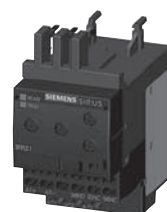
3RR2142-1AW30



3RR2241-1FW30



3RR2242-1FW30



3RR2141-2AA30



3RR2243-3FW30

Size	Measuring range	Hysteresis	Control supply voltage U_s	Screw terminals	Spring-type terminals
A	A	V		Order No.	Order No.

Basic versions

- Analogically adjustable
- Closed-circuit principle
- 1 CO contact
- 2-phase current monitoring
- Apparent current monitoring
- Start-up delay 0 ... 60 s

S00	1.6 ... 16	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	3RR2141-1AA30 3RR2141-1AW30	3RR2141-2AA30 3RR2141-2AW30
S0	4 ... 40	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	3RR2142-1AA30 3RR2142-1AW30	3RR2142-2AA30 3RR2142-2AW30
S2	8 ... 80	6.25 % of threshold value	24 AC/DC 24 ... 240 AC/DC	3RR2143-1AA30 3RR2143-1AW30	3RR2143-3AA30 3RR2143-3AW30

Standard versions

- Digitally adjustable
- LC display
- Open or closed-circuit principle
- 1 CO contact
- 1 semiconductor output
- 3-phase current monitoring
- Active current or apparent current monitoring
- Phase sequence monitoring
- Residual current monitoring
- Blocking current monitoring
- Reclosing delay time 0 ... 300 min
- Start-up delay 0 ... 99 s
- Separate settings for warning and alarm thresholds

S00	1.6 ... 16	0.1 ... 3	24 AC/DC 24 ... 240 AC/DC	3RR2241-1FA30 3RR2241-1FW30	3RR2241-2FA30 3RR2241-2FW30
S0	4 ... 40	0.1 ... 8	24 AC/DC 24 ... 240 AC/DC	3RR2242-1FA30 3RR2242-1FW30	3RR2242-2FA30 3RR2242-2FW30
S2	8 ... 80	0.2 ... 16	24 AC/DC 24 ... 240 AC/DC	3RR2243-1FA30 3RR2243-1FW30	3RR2243-3FA30 3RR2243-3FW30

Contactors and Contactor Assemblies

Contactor Assemblies for Switching Motors

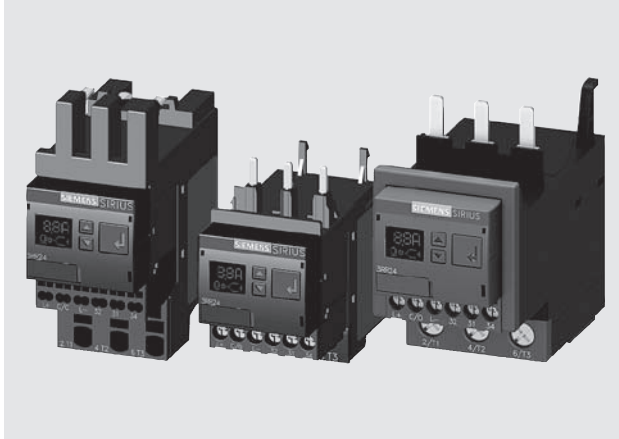
Current Monitoring Relays with IO-Link

• Revised •
04/20/15

SIRIUS



Overview



SIRIUS 3RR2441, 3RR2442 and 3RR2443 current monitoring relays

The SIRIUS 3RR24 current monitoring relays for IO-Link are suitable for the load monitoring of motors or other loads. In three phases they monitor the rms value of AC currents for overshooting or undershooting of set threshold values.

Whereas apparent current monitoring is used above all in connection with the rated torque or in case of overload, the active current monitoring option, which is also selectable, can be used to observe and evaluate the load factor over a motor's entire torque range.

The 3RR24 current monitoring relays for IO-Link can be integrated directly in the feeder by mounting onto the 3RT2 contactor; separate wiring of the main circuit is therefore superfluous. No separate transformers are required.

For a line-oriented configuration or simultaneous use of an overload relay, terminal supports for stand-alone installation are available for separate standard rail mounting.

The SIRIUS 3RR24 current monitoring relays for IO-Link also offer many other options based upon the monitoring functions of the conventional SIRIUS 3RR2 monitoring relays:

- Measured value transmission to a controller, including resolution and unit, may be parameterizable as to which value is cyclically transmitted
- Transmission of alarm flags to a controller
- Full diagnosis capability by inquiry as to the cause of the fault in the diagnosis data record
- Remote parameterization is also possible, in addition to or instead of local parameterization

- Rapid parameterization of the same devices by duplication of the parameterization in the controller
- Parameter transmission by upload to a controller by IO-Link call or by parameter server (if IO-Link master from IO-Link Specification V 1.1 and higher is used)
- Consistent central data storage in the event of parameter change locally or via a controller
- Automatic reparameterizing when devices are exchanged
- Blocking of local parameterization via IO-Link possible
- Faults are saved in parameterizable and non-volatile fashion to prevent an automatic start up after voltage failure and to make sure diagnostics data is not lost
- By integration into the automation level the option exists of parameterizing the monitoring relay at any time via a display unit or displaying the measured values in a control room or locally at the machine/control cabinet

Even without communication via IO-Link the devices continue to function fully autonomously:

- Parameterization can take place locally at the device, independently of a controller
- In the event of failure or before the controller becomes available the monitoring relays work as long as the control supply voltage (24 V DC) is present
- If the monitoring relays are operated without the controller, the 3RR24 monitoring relays for IO-Link have, thanks to the integrated SIO mode, an additional semiconductor output, which switches when the adjustable warning threshold is exceeded

Thanks to the combination of autonomous monitoring relay function and integrated IO-Link communication, redundant sensors and/or analog signal converters – which previously took over the transmission of measured values to a controller, leading to considerable extra cost and wiring outlay – are no longer needed.

Because the output relays are still present, the monitoring relays increase the functional reliability of the system, since only the controller can fulfill the control tasks if the current measured values are available, whereas the output relays can also be used for the disconnection of the system if limit values that cannot be reached during operation are exceeded.

For further information on the IO-Link communication system, see [Chapter 14](#).

**Benefits**

- Can be mounted directly on 3RT2 contactors and 3RA23 reversing contactor assemblies, in other words, there is no need for additional wiring in the main circuit
- Optimally coordinated with the technical characteristics of the 3RT2 contactors
- No separate current transformer required
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Display of ACTUAL value and status messages
- All versions with removable control current terminals
- All versions with screw or spring-type terminals
- Simple determination of the threshold values through direct reference to actually measured values for setpoint loading
- Range monitoring and selectable active current measurement mean that only one device for monitoring a motor is required along the entire torque curve
- In addition to current monitoring it is also possible to monitor for current unbalance, broken cables, phase failure, phase sequence, residual current and motor blocking
- Integrated counter for operating cycles and operating hours to support requirements-based maintenance of the monitored machine or application
- Simple cyclical transmission of the current measured values, relay switching states and events to a controller
- Remote parameterization
- Automatic reparameterizing when devices are exchanged
- Simple duplication of identical or similar parameterizations
- Reduction of control current wiring
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Integration in TIA means clear diagnostics if a fault occurs
- Cost saving and space saving in control cabinet due to the elimination of AI and IO modules as well as analog signal converters and duplicated sensors

Application

- Monitoring of current overshoot and undershoot
- Monitoring of broken conductors
- Monitoring of no-load operation and load shedding, e.g. in the event of a torn V-belt or no-load operation of a pump
- Monitoring of overload, e.g. on pumps due to a dirty filter system
- Monitoring the functionality of electrical loads such as heaters
- Monitoring of wrong phase sequence on mobile equipment such as compressors or cranes
- Monitoring of high-impedance faults to ground, e.g. caused by damaged insulation or moisture

The use of SIRIUS monitoring relays for IO-Link is particularly recommended for machines and plant in which these relays, in addition to their monitoring function, are to be connected to the automation level for the rapid, simple and fault-free provision of the current measured values and/or for remote parameterization.

The monitoring relays can either relieve the controller of monitoring tasks or, as a second monitoring entity in parallel to and independent of the controller, increase the reliability in the process or in the system. In addition, the elimination of AI and IO modules allows the width of the controller to be reduced despite significantly expanded functionality.

Contactors and Contactor Assemblies

Contactor Assemblies for Switching Motors

Current Monitoring Relays with IO-Link

• Revised •
04/20/15

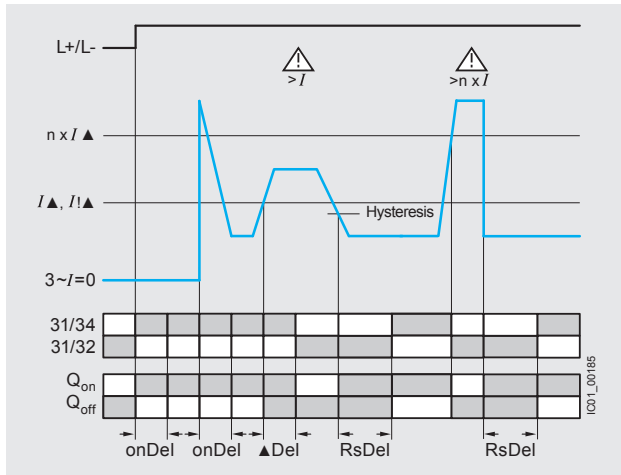


Technical specifications

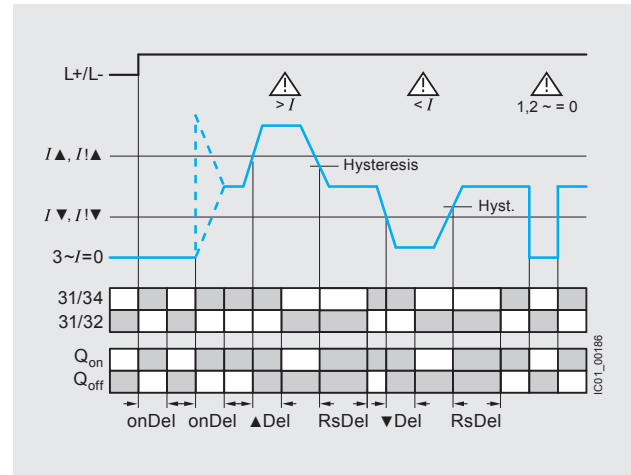
Function charts of 3RR24 for IO-Link, digitally adjustable

With the closed-circuit principle selected upon application of the control supply voltage

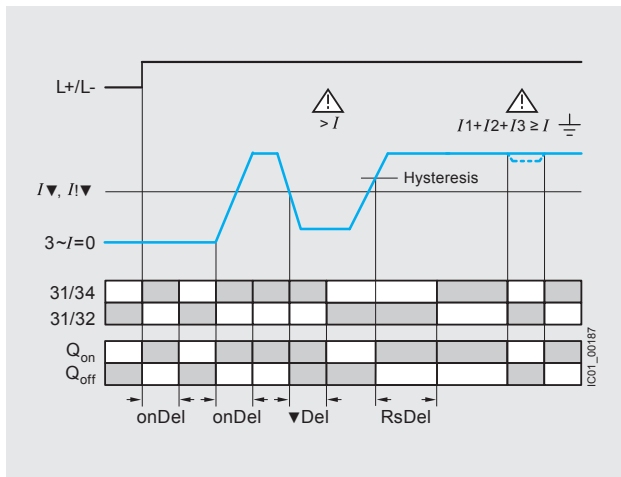
Current overshoot



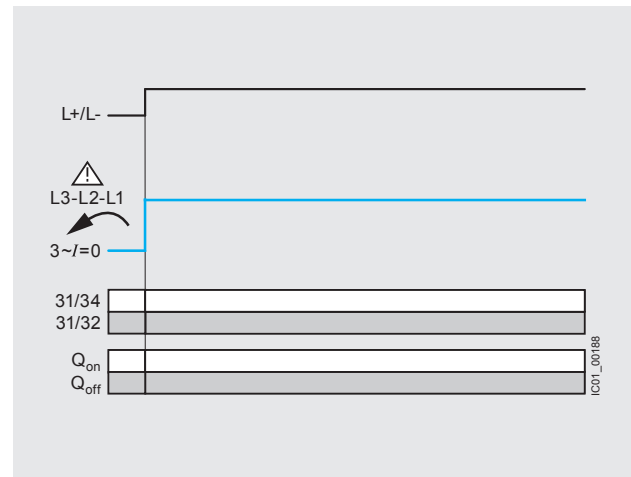
Range monitoring



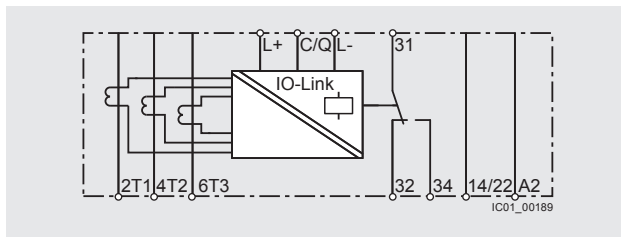
Current undershoot with residual current monitoring



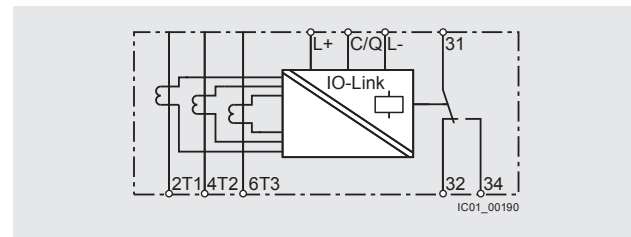
Phase sequence monitoring



Circuit diagrams



3RR2441-1AA40



3RR2441-2AA40, 3RR2442-AA40, 3RR2443-AA40

Note:

It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

Selection and ordering data

SIRIUS 3RR24 current monitoring relays for IO-Link

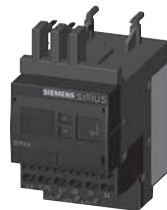
- For load monitoring of motors or other loads
- Multi-phase monitoring of undercurrent and overcurrent
- Starting and tripping delay can be adjusted separately
- Tripping delay 0 to 999.9 s
- Auto or Manual RESET



3RR2441-1AA40



3RR2442-1AA40



3RR2441-2AA40



3RR2442-2AA40



3RR2443-1AA40



3RR2443-3AA40

Size	Measuring range	Hysteresis	Control supply voltage U_c	Screw terminals	Spring-type terminals
A	A	V		Order No.	Order No.
<ul style="list-style-type: none"> • Digitally adjustable • LC display • Open or closed-circuit principle • 1 CO contact • 1 semiconductor output (in SIO mode) • 3-phase current monitoring • Active current or apparent current monitoring • Current unbalance monitoring • Phase sequence monitoring • Residual current monitoring • Blocking current monitoring • Operating hours counter • Operating cycles counter • Reclosing delay time 0 ... 300 min • Start-up delay 0 ... 999.9 s • Separate settings for warning and alarm thresholds 					
S00	1.6 ... 16	0.1 ... 3	24 DC	3RR2441-1AA40	3RR2441-2AA40
S0	4 ... 40	0.1 ... 8	24 DC	3RR2442-1AA40	3RR2442-2AA40
S2	8 ... 80	0.2 ... 16	24 DC	3RR2443-1AA40	3RR2443-3AA40

Contactors and Contactor Assemblies



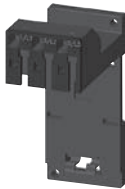

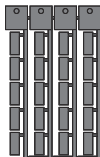



Contactor Assemblies for Switching Motors

Current Monitoring Relay Accessories

• Revised •
04/20/15



Accessories

Use	Version	Size	Order No.	Standard Pack Quantity
Terminal supports for stand-alone installation ¹⁾				
	For 3RR21, 3RR22, 3RR24	For separate mounting of the overload relays or monitoring relays; screw and snap-on mounting onto TH 35 standard mounting rail according to IEC 60715	Screw terminals 	
3RU2916-3AA01		<ul style="list-style-type: none">Screw connection S00 S0 S2	3RU2916-3AA01 3RU2926-3AA01 3RU2936-3AA01	1 unit 1 unit 1 unit
		<ul style="list-style-type: none">Spring-type connection S00 S0	Spring-type terminals 	
3RU2926-3AC01			3RU2916-3AC01 3RU2926-3AC01	1 unit 1 unit
Blank labels				
	For 3RR21, 3RR22, 3RR24	Unit labeling plates²⁾ For SIRIUS devices 20 mm x 7 mm, titanium gray	3RT2900-1SB20	340 units
3RT2900-1SB20				
Sealable covers				
	For 3RR21, 3RR22, 3RR24	Sealable covers For securing against unintentional or unauthorized adjustment of settings	3RR2940	5 units
3RR2940	For 3RR21	Sealing foil For securing against unauthorized adjustment of setting knobs	3TK2820-0AA00	1 unit
Tools for opening spring-type terminals				
	For auxiliary circuit connections	Screwdrivers For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated	Spring-type terminals 	
3RA2908-1A			3RA2908-1A	1 unit

¹⁾ The accessories are identical to those of the 3RU21 thermal overload relays and the 3RB3 electronic overload relays, [see Chapter 3 "Overload Relays"](#).

²⁾ PC labeling system for individual inscription of unit labeling plates available from: Systems, Inc.
www.murrplastic.com



• Revised •
04/20/15

Contactor and Contactor Assemblies

Contactor Assemblies for Switching Motors

NEMA 1 Enclosure

1

2

Selection and ordering data

- * NEMA Type 1 Enclosures
- * Lift off cover
- * Accepts SIRIUS power control components
 - * Non-reversing contactors
 - * Reversing contactors
 - * Starters with thermal overload relays
 - * Starters with solid-state overload relays

Application

The 49EC14*B separate enclosures are designed for field assembly of a wide range of Siemens SIRIUS open style control components and field modification kits as listed in the charts below. Note that certain components require the addition of a DIN Rail kit for proper mounting in the enclosure.

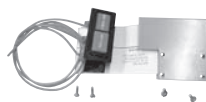


49EC14EB110705R

NEMA 1 Enclosures

Max. current	Contactor		Max. current	Overload relay		Required DIN rail kit	NEMA 1 Enclosure
A	Non-reversing	Reversing	A	Thermal	Solid-state	Order No.	Order No.
16	3RT201	3RA231	16	3RU2116	3RB3016	MTR5	49EC14EB110705R
38	3RT202	3RA232	40	3RU2126	3RB3026	MTR5	
50	3RT103		50	3RU1136	3RB2036	—	49EC14GB140807R
12		3RA131	12	3RU1116	3RB2016	MTR5	
25		3RA132	25	3RU1126	3RB2026	MTR5	
50		3RA133	50	3RU1136	3RB2036	—	
95	3RT104		100	3RU1146	3RB2046	—	49EC14IB201208R
95		3RA134	100	3RU1146	3RB2046	—	

Accessories for NEMA 1 Enclosures



49SBPB5



49SBSB1



49SBLBF

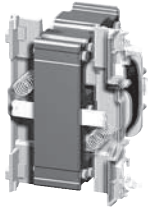
Accessory type	Description	Marking	Voltage	Order No.
Push button		Start-stop		49SBPB5
		Reset (blue)		49MBRS
Selector switch	2 position	Off-on		49SBSB4
	3 position	Hand-off-auto		49SBSB1
		For-off-rev		49SBSB2
Pilot light	Lens colors: red, green, amber	High-off-low	24 V AC 120 V AC 208, 240, 277 V AC 480 V AC 600 V AC	49SBSB3
		Legends: ON, RUN, OFF, OL TRIPPED, FORWARD, REVERSE, LOW HIGH		49SBLBJ
				49SBLBF
				49SBLBG
				49SBLBH
				49SBLBE

For 3RT contactors, see page 2/8.
 For 3RA reversing, see pages 2/37.
 For thermal overloads, see page 3/10.
 For solidstate overloads, see pages 3/22.
 For enclosure dimensions, see figures 1, 2, and 3 on page 9/150.



Selection and ordering data

For screw, spring-type and ring lug terminal connection



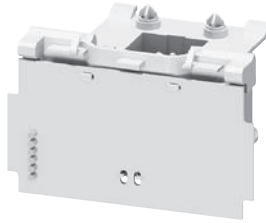
3RT29 24-5A.01

For contactors		Rated control supply voltage U_s			Order No.	Weight approx.	
Size	Type	50 Hz	50/60 Hz	60 Hz			
		V	V	V			kg
Solenoid coils · AC operation							
S0	3RT20 23, 3RT20 24, 3RT20 25	24	--	--	3RT29 24-5AB01	0.100	
		42	--	--	3RT29 24-5AD01	0.100	
		48	--	--	3RT29 24-5AH01	0.100	
		110	--	--	3RT29 24-5AF01	0.100	
		230	--	--	3RT29 24-5AP01	0.100	
		400	--	--	3RT29 24-5AV01	0.100	
	--	24	--	--	3RT29 24-5AC21	0.100	
		42	--	--	3RT29 24-5AD21	0.100	
		48	--	--	3RT29 24-5AH21	0.100	
		110	--	--	3RT29 24-5AG21	0.100	
		220	--	--	3RT29 24-5AN21	0.100	
		230	--	--	3RT29 24-5AL21	0.100	
	110 220	--	--	120	3RT29 24-5AK61	0.100	
		--	--	240	3RT29 24-5AP61	0.100	
		--	100	110	3RT29 24-5AG61	0.100	
		--	200	220	3RT29 24-5AN61	0.100	
		--	400	440	3RT29 24-5AR61	0.100	
		--	--	--	--	--	
	S0	3RT20 26, 3RT20 27, 3RT20 28 3RT23 25, 3RT23 26, 3RT23 27 3RT25 26	24	--	--	3RT29 26-5AB01	0.100
			42	--	--	3RT29 26-5AD01	0.100
48			--	--	3RT29 26-5AH01	0.100	
110			--	--	3RT29 26-5AF01	0.100	
230			--	--	3RT29 26-5AP01	0.100	
400			--	--	3RT29 26-5AV01	0.100	
--		24	--	--	3RT29 26-5AC21	0.100	
		42	--	--	3RT29 26-5AD21	0.100	
		48	--	--	3RT29 26-5AH21	0.100	
		110	--	--	3RT29 26-5AG21	0.100	
		208	--	--	3RT29 26-5AM21	0.100	
		220	--	--	3RT29 26-5AN21	0.100	
110 220		--	--	120	3RT29 26-5AK61	0.100	
		--	--	240	3RT29 26-5AP61	0.100	
		--	100	110	3RT29 26-5AG61	0.100	
		--	200	220	3RT29 26-5AN61	0.100	
		--	400	440	3RT29 26-5AR61	0.100	
		500	--	--	3RT29 26-5AQ21	0.100	
--		277	--	--	3RT29 26-5AU61	0.100	
		480	--	--	3RT29 26-5AV61	0.100	
	600	--	--	3RT29 26-5AT61	0.100		
	--	--	--	--	--		

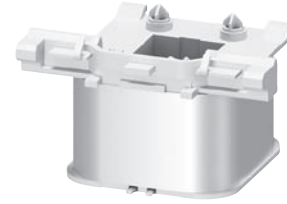
Note:

Contactors with AC and AC/DC coils have different depths. It is only possible to replace the coils on AC contactors with AC coils, and on AC/DC contactors with AC/DC coils. It is not possible to replace the coils on DC contactors in the S0 frame.

For screw, spring-type and ring terminal lug connection



3RT2934-5N.31



3RT2934-5A.01

For contactors		Rated control supply voltage U_s				Order No.	Weight approx.
Size	Type	50 Hz	50/60 Hz	60 Hz	DC		
		V	V	V			
Solenoid coils • AC operation							
S2	3RT203.-A	24	--	--	--	3RT2934-5AB01	
	3RT233.-A	42	--	--	--	3RT2934-5AD01	
		48	--	--	--	3RT2934-5AH01	
			110	--	--	--	
		230	--	--	--	3RT2934-5AP01	
			400	--	--	--	
	--	24	--	--	3RT2934-5AC21		
		42	--	--	3RT2934-5AD21		
		48	--	--	3RT2934-5AH21		
		110	--	--	3RT2934-5AG21		
		220	--	--	3RT2934-5AN21		
	230	--	--	3RT2934-5AL21			
	110	--	120	--	3RT2934-5AK61		
		220	--	240	--	3RT2934-5AP61	
	--	--	480	--	3RT2934-5AV61		
		--	600	--	3RT2934-5AT61		
--	100	110	--	3RT2934-5AG61			
	200	220	--	3RT2934-5AN61			
--	400	440	--	3RT2934-5AR61			
Solenoid coils • AC/DC operation, with varistor							
S2	3RT203.-N	--	20 ... 33	--	20 ... 33	3RT2934-5NB31	
	3RT233.-N	--	30 ... 42	--	30 ... 42	3RT2934-5ND31	
	3RT253.-N	--	48 ... 80	--	48 ... 80	3RT2934-5NE31	
		--	83 ... 155	--	83 ... 155	3RT2934-5NF31	
	--	175 ... 280	--	175 ... 280	3RT2934-5NP31		

Note:

It is only possible to replace the coils on AC contactors with AC coils, and on AC/DC contactors with AC/DC coils.




Contactors and Contactor Assemblies

3RT Contactors







Spare parts for 3RT1 contactors

Selection and ordering data

For contactor		Rated control supply voltage U_s		Screw connection	Spring-type connection	Weight approx.
Size				Order No.	Order No.	kg
Type						
Coils · AC operation						
	S0	3RT10 2.,	24 V, 50 Hz	3RT19 24-5AB01	3RT19 24-5AB02	0.069
		3RT13 2.,	42 V, 50 Hz	3RT19 24-5AD01	3RT19 24-5AD02	
		3RT15 2.,	48 V, 50 Hz	3RT19 24-5AH01	3RT19 24-5AH02	
			110 V, 50 Hz	3RT19 24-5AF01	3RT19 24-5AF02	
			230 V, 50 Hz	3RT19 24-5AP01	3RT19 24-5AP02	
			400 V, 50 Hz	3RT19 24-5AV01	3RT19 24-5AV02	
			24 V, 50/60 Hz	3RT19 24-5AC21	3RT19 24-5AC22	
			42 V, 50/60 Hz	3RT19 24-5AD21	3RT19 24-5AD22	
			48 V, 50/60 Hz	3RT19 24-5AH21	3RT19 24-5AH22	
			110 V, 50/60 Hz	3RT19 24-5AG21	3RT19 24-5AG22	
			208 v, 50/60 Hz	3RT19 24-5AM21	3RT19 24-5AM22	
			220 V, 50/60 Hz	3RT19 24-5AN21	3RT19 24-5AN22	
			230 V, 50/60 Hz	3RT19 24-5AL21	3RT19 24-5AL22	
			110 V, 50 Hz/120 V, 60 Hz	3RT19 24-5AK61	3RT19 24-5AK62	
			220 V, 50 Hz/240 V, 60 Hz	3RT19 24-5AP61	3RT19 24-5AP62	
			277 V, 60 Hz	3RT19 24-5AU61	3RT19 24-5AU62	
	480 V, 60 Hz	3RT19 24-5AV61	3RT19 24-5AV62			
	600 V, 60 Hz	3RT19 24-5AT61	3RT19 24-5AT62			
		3RT19 24-5AG61	3RT19 24-5AG62			
		3RT19 24-5AN61	3RT19 24-5AN62			
		3RT19 24-5AR61	3RT19 24-5AR62			
	S2	3RT10 33	24 V, 50 Hz	3RT19 34-5AB01	3RT19 34-5AB02	0.088
		3RT10 34	42 V, 50 Hz	3RT19 34-5AD01	3RT19 34-5AD02	
			48 V, 50 Hz	3RT19 34-5AH01	3RT19 34-5AH02	
			110 V, 50 Hz	3RT19 34-5AF01	3RT19 34-5AF02	
			230 V, 50 Hz	3RT19 34-5AP01	3RT19 34-5AP02	
			400 V, 50 Hz	3RT19 34-5AV01	3RT19 34-5AV02	
			42 V, 50/60 Hz	3RT19 34-5AD21	3RT19 34-5AD22	
			48 V, 50/60 Hz	3RT19 34-5AH21	3RT19 34-5AH22	
			24 V, 50/60 Hz	3RT19 34-5AC21	3RT19 34-5AC22	
			110 V, 50/60 Hz	3RT19 34-5AG21	3RT19 34-5AG22	
			208 V, 50/60 Hz	3RT19 34-5AM21	3RT19 34-5AM22	
			220 V, 50/60 Hz	3RT19 34-5AN21	3RT19 34-5AN22	
			230 V, 50/60 Hz	3RT19 34-5AL21	3RT19 34-5AL22	
			110 V, 50 Hz/120 V, 60 Hz	3RT19 34-5AK61	3RT19 34-5AK62	
			220 V, 50 Hz/240 V, 60 Hz	3RT19 34-5AP61	3RT19 34-5AP62	
			277 V, 60 Hz	3RT19 34-5AU61	3RT19 34-5AU62	
	480 V, 60 Hz	3RT19 34-5AV61	3RT19 34-5AV62			
	600 V, 60 Hz	3RT19 34-5AT61	3RT19 34-5AT62			
		3RT19 34-5AG61	3RT19 34-5AG62			
		3RT19 34-5AN61	3RT19 34-5AN62			
		3RT19 34-5AR61	3RT19 34-5AR62			
		3RT10 35,	24 V, 50 Hz	3RT19 35-5AB01	3RT19 35-5AB02	0.088
		3RT10 36,	42 V, 50 Hz	3RT19 35-5AD01	3RT19 35-5AD02	
		3RT13 3.,	48 V, 50 Hz	3RT19 35-5AH01	3RT19 35-5AH02	
		3RT15 3.,	110 V, 50 Hz	3RT19 35-5AF01	3RT19 35-5AF02	
			230 V, 50 Hz	3RT19 35-5AP01	3RT19 35-5AP02	
			400 V, 50 Hz	3RT19 35-5AV01	3RT19 35-5AV02	
			24 V, 50/60 Hz	3RT19 35-5AC21	3RT19 35-5AC22	
			42 V, 50/60 Hz	3RT19 35-5AD21	3RT19 35-5AD22	
			48 V, 50/60 Hz	3RT19 35-5AH21	3RT19 35-5AH22	
			110 V, 50/60 Hz	3RT19 35-5AG21	3RT19 35-5AG22	
			208 V, 50/60 Hz	3RT19 35-5AM21	3RT19 35-5AM22	
			220 V, 50/60 Hz	3RT19 35-5AN21	3RT19 35-5AN22	
			230 V, 50/60 Hz	3RT19 35-5AL21	3RT19 35-5AL22	
			110 V, 50 Hz/120 V, 60 Hz	3RT19 35-5AK61	3RT19 35-5AK62	
			220 V, 50 Hz/240 V, 60 Hz	3RT19 35-5AP61	3RT19 35-5AP62	
			277 V, 60 Hz	3RT19 35-5AU61	3RT19 35-5AU62	
	480 V, 60 Hz	3RT19 35-5AV61	3RT19 35-5AV62			
	600 V, 60 Hz	3RT19 35-5AT61	3RT19 35-5AT62			
		3RT19 35-5AG61	3RT19 35-5AG62			
		3RT19 35-5AN61	3RT19 35-5AN62			
		3RT19 35-5AR61	3RT19 35-5AR62			



Selection and ordering data

For contactor		Rated control supply voltage U_s		Screw connection		Spring-type connection		Weight approx.				
Size		Type		Order No.		Order No.		kg				
Coils · AC operation												
	S3	3RT10 44	24 V, 50 Hz	3RT19 44-5AB01	3RT19 44-5AB02	0.130						
			42 V, 50 Hz	3RT19 44-5AD01	3RT19 44-5AD02							
			48 V, 50 Hz	3RT19 44-5AH01	3RT19 44-5AH02							
			110 V, 50 Hz	3RT19 44-5AF01	3RT19 44-5AF02							
			230 V, 50 Hz	3RT19 44-5AP01	3RT19 44-5AP02							
			400 V, 50 Hz	3RT19 44-5AV01	3RT19 44-5AV02							
			24 V, 50/60 Hz	3RT19 44-5AC21	3RT19 44-5AC22							
			42 V, 50/60 Hz	3RT19 44-5AD21	3RT19 44-5AD22							
			48 V, 50/60 Hz	3RT19 44-5AH21	3RT19 44-5AH22							
			110 V, 50/60 Hz	3RT19 44-5AG21	3RT19 44-5AG22							
			208 V, 50/60 Hz	3RT19 44-5AM21	3RT19 44-5AM22							
			220 V, 50/60 Hz	3RT19 44-5AN21	3RT19 44-5AN22							
		3RT10 45, 3RT10 46, 3RT13 4., 3RT14 46	230 V, 50/60 Hz	3RT19 44-5AL21	3RT19 44-5AL22	0.130						
			110 V, 50 Hz/120 V, 60 Hz	3RT19 44-5AK61	3RT19 44-5AK62							
			220 V, 50 Hz/240 V, 60 Hz	3RT19 44-5AP61	3RT19 44-5AP62							
			277 V, 60 Hz	3RT19 44-5AU61	3RT19 44-5AU62							
			480 V, 60 Hz	3RT19 44-5AV61	3RT19 44-5AV62							
			600 V, 60 Hz	3RT19 44-5AT61	3RT19 44-5AT62							
			100 V, 50/60 Hz/110 V, 60 Hz	3RT19 44-5AG61	3RT19 44-5AG62							
			200 V, 50/60 Hz/220 V, 60 Hz	3RT19 44-5AN61	3RT19 44-5AN62							
			400 V, 50/60 Hz/440 V, 60 Hz	3RT19 44-5AR61	3RT19 44-5AR62							
			24 V, 50 Hz	3RT19 45-5AB01	3RT19 45-5AB02							
			42 V, 50 Hz	3RT19 45-5AD01	3RT19 45-5AD02							
			48 V, 50 Hz	3RT19 45-5AH01	3RT19 45-5AH02							
		3RT10 45-5AP02	110 V, 50 Hz	3RT19 45-5AF01	3RT19 45-5AF02	0.130						
			230 V, 50 Hz	3RT19 45-5AP01	3RT19 45-5AP02							
			400 V, 50 Hz	3RT19 45-5AV01	3RT19 45-5AV02							
			24 V, 50/60 Hz	3RT19 45-5AC21	3RT19 45-5AC22							
			42 V, 50/60 Hz	3RT19 45-5AD21	3RT19 45-5AD22							
			48 V, 50/60 Hz	3RT19 45-5AH21	3RT19 45-5AH22							
			110 V, 50/60 Hz	3RT19 45-5AG21	3RT19 45-5AG22							
			208 V, 50/60 Hz	3RT19 45-5AM21	3RT19 45-5AM22							
			220 V, 50/60 Hz	3RT19 45-5AN21	3RT19 45-5AN22							
			230 V, 50/60 Hz	3RT19 45-5AL21	3RT19 45-5AL22							
			110 V, 50 Hz/120 V, 60 Hz	3RT19 45-5AK61	3RT19 45-5AK62							
			220 V, 50 Hz/240 V, 60 Hz	3RT19 45-5AP61	3RT19 45-5AP62							
			277 V, 60 Hz	3RT19 45-5AU61	3RT19 45-5AU62	0.130						
			480 V, 60 Hz	3RT19 45-5AV61	3RT19 45-5AV62							
			600 V, 60 Hz	3RT19 45-5AT61	3RT19 45-5AT62							
			100 V, 50/60 Hz/110 V, 60 Hz	3RT19 45-5AG61	3RT19 45-5AG62							
			200 V, 50/60 Hz/220 V, 60 Hz	3RT19 45-5AN61	3RT19 45-5AN62							
			400 V, 50/60 Hz/440 V, 60 Hz	3RT19 45-5AR61	3RT19 45-5AR62							
			Coils · DC operation									
				S2	3RT10 3., 3RT13 3., 3RT15 3.		24 V	3RT19 34-5BB41	3RT19 34-5BB42	0.558		
							42 V	3RT19 34-5BD41	3RT19 34-5BD42			
							48 V	3RT19 34-5BW41	3RT19 34-5BW42			
							60 V	3RT19 34-5BE41	3RT19 34-5BE42			
							110 V	3RT19 34-5BF41	3RT19 34-5BF42			
125 V	3RT19 34-5BG41	3RT19 34-5BG42										
220 V	3RT19 34-5BM41	3RT19 34-5BM42										
230 V	3RT19 34-5BP41	3RT19 34-5BP42										
	S3	3RT10 4., 3RT13 4., 3RT14 4.				24 V	3RT19 44-5BB41	3RT19 44-5BB42	0.916			
						42 V	3RT19 44-5BD41	3RT19 44-5BD42				
						48 V	3RT19 44-5BW41	3RT19 44-5BW42				
						60 V	3RT19 44-5BE41	3RT19 44-5BE42				
			110 V	3RT19 44-5BF41	3RT19 44-5BF42							
			125 V	3RT19 44-5BG41	3RT19 44-5BG42							
			220 V	3RT19 44-5BM41	3RT19 44-5BM42							
			230 V	3RT19 44-5BP41	3RT19 44-5BP42							

Contactors and Contactor Assemblies

3RT Contactors

SIRIUS



Spare parts for 3RT1 contactors

Selection and ordering data

For contactor		Rated control supply voltage $U_{s \text{ min}}$ to $U_{s \text{ max}}$	Order No.	Weight approx. kg
Size	Type	AC/DC V		

Withdrawable coils

3RT19 55-5A...



Conventional operating mechanism

S6	3RT10 5,	23 ... 26	3RT19 55-5AB31 3RT19 55-5AD31 3RT19 55-5AF31 3RT19 55-5AM31 3RT19 55-5AP31 3RT19 55-5AU31 3RT19 55-5AV31 3RT19 55-5AR31 3RT19 55-5AS31 3RT19 55-5AT31	0.49
	3RT14 5	42 ... 48		
		110 ... 127		
S10		200 ... 220	3RT19 65-5AB31 3RT19 65-5AD31 3RT19 65-5AF31 3RT19 65-5AM31 3RT19 65-5AP31 3RT19 65-5AU31 3RT19 65-5AV31 3RT19 65-5AR31 3RT19 65-5AS31 3RT19 65-5AT31	0.65
		220 ... 240		
		240 ... 277		
		380 ... 420		
		440 ... 480		
		500 ... 550		
		575 ... 600		
	3RT12 6	23 ... 26		
	Vacuum contactor	42 ... 48		
S12		110 ... 127	3RT19 66-5AB31 3RT19 66-5AD31 3RT19 66-5AF31 3RT19 66-5AM31 3RT19 66-5AP31 3RT19 66-5AU31 3RT19 66-5AV31 3RT19 66-5AR31 3RT19 66-5AS31 3RT19 66-5AT31	1.1
		200 ... 220		
		220 ... 240		
		240 ... 277		
		380 ... 420		
		440 ... 480		
		500 ... 550		
		575 ... 600		
	3RT10 7,	23 ... 26		
	3RT14 7,	42 ... 48		
	3RT12 7	110 ... 127		
	Vacuum contactor	200 ... 220		
		220 ... 240		
		240 ... 277		
		380 ... 420		
		440 ... 480		
		500 ... 550		
		575 ... 600		

Withdrawable coils

3RT19 55-5N...



Solid-state operating mechanism · for DC 24 V PLC output

S6	3RT10 5,	21 ... 27.3	3RT19 55-5NB31 3RT19 55-5NF31 3RT19 55-5NP31	0.49
	3RT14 5	96 ... 127		
		200 ... 277		
S10	3RT10 6,	21 ... 27.3	3RT19 65-5NB31 3RT19 65-5NF31 3RT19 65-5NP31	0.65
	3RT14 6	96 ... 127		
		200 ... 277		
S12	3RT12 6	21 ... 27.3	3RT19 66-5NB31 3RT19 66-5NF31 3RT19 66-5NP31	1.1
	Vacuum contactor	96 ... 127		
		200 ... 277		
S12	3RT10 7,	21 ... 27.3	3RT19 75-5NB31 3RT19 75-5NF31 3RT19 75-5NP31	1.1
	3RT14 7,	96 ... 127		
	3RT12 7	200 ... 277		
	Vacuum contactor			

Solid-state operating mechanism · for DC 24 V PLC output/PLC relay output, with remaining lifetime indication (withdrawable coil with lateral electronics module)

S6	3RT10 5,	96 ... 127	3RT19 55-5PF31 3RT19 55-5PP31	1.1
	3RT14 5	200 ... 277		
S10	3RT10 6,	96 ... 127	3RT19 65-5PF31 3RT19 65-5PP31	1.1
	3RT14 6	200 ... 277		
S12	3RT10 7,	96 ... 127	3RT19 75-5PF31 3RT19 75-5PP31	1.1
	3RT14 7	200 ... 277		

Selection and ordering data

For contactor		Design	Order No.	Weight approx.	Pack.
Size	Type			kg	

Arc chutes

S2	3RT20 3. 3RT20 3.	For AC coil contactors only For UC (AC/DC) coil contactors only	3RT29 36-7A 3RT29 36-7B		1 unit
S3	3RT10 4., 3RT14 46		3RT19 46-7A		
S6	3RT10 54 3RT10 55 3RT10 56		3RT19 54-7A 3RT19 55-7A 3RT19 56-7A	0.72	
S10	3RT10 64 3RT10 65 3RT10 66		3RT19 64-7A 3RT19 65-7A 3RT19 66-7A	1.24	
S12	3RT10 75 3RT10 76		3RT19 75-7A 3RT19 76-7A	1.4	
S6	3RT14 56		3RT19 56-7B	0.72	
S10	3RT14 66		3RT19 66-7B	1.24	
S12	3RT14 76		3RT19 76-7B	1.4	

Contacts with fixing parts

• for contactors with 3 main contacts

S2	3RT20 35 3RT20 36 3RT20 37 3RT20 38	Main contacts (3 NO) for AC-3 utilization category (1 set = 3 moving and 6 fixed contacts with fixing parts)	3RT29 35-6A 3RT29 36-6A 3RT29 37-6A 3RT29 38-6A		1 set
S3	3RT10 44 3RT10 45 3RT10 46		3RT19 44-6A 3RT19 45-6A 3RT19 46-6A		
S6	3RT10 54 3RT10 55 3RT10 56		3RT19 54-6A 3RT19 55-6A 3RT19 56-6A	0.28	
S10	3RT10 64 3RT10 65 3RT10 66		3RT19 64-6A 3RT19 65-6A 3RT19 66-6A	0.48	
S12	3RT10 75 3RT10 76		3RT19 75-6A 3RT19 76-6A	0.9	
S3	3RT14 46	Main contacts (3 NO) for AC-1 utilization category (1 set = 3 moving and 6 fixed contacts with fixing parts)	3RT19 46-6D		
S6	3RT14 56		3RT19 56-6D	0.28	
S10	3RT14 66		3RT19 66-6D	0.48	
S12	3RT14 76		3RT19 76-6D	0.9	

• for 3RT12 vacuum contactors

S10	3RT12 64 3RT12 65 3RT12 66	3 vacuum interrupters with fixing parts	3RT19 64-6V 3RT19 65-6V 3RT19 66-6V	1.4	1 set
S12	3RT12 75 3RT12 76		3RT19 75-6V 3RT19 76-6V	1.5	

• for contactors with 4 main contacts

S2	3RT23 36 3RT23 37	Main contacts (4 NO contacts) for utilization category AC-1	3RT29 36-6E 3RT29 37-6E		1 set
S3	3RT13 44 3RT13 46	(1 set = 4 moving and 8 fixed contacts with fixing parts)	3RT19 44-6E 3RT19 46-6E		



Rated control supply voltages for coils

Selection and ordering data

Coil type		3TY6 503-0A..	3TB50	3TY7 683-0C..	3TF68	
Rated control supply voltage U_s	Control supply voltage at	3TY6 523-0A..	3TB52	3TY7 693-0C..	3TF69	
		3TY6 543-0A..	3TB54			
		3TY6 566-0A..	3TB56			

Rated control supply voltages (changes to 10th and 11th positions of the Order No.)

AC operation

Coils for 50 Hz						
50 Hz	60 Hz					
AC 24 V	AC 39 V	B0		—		
AC 32 V	AC 28 V	—		—		
AC 36 V	AC 42 V	G0		—		
AC 42 V	AC 50 V	D0		—		
AC 48 V	AC 58 V	H0		—		
AC 60 V	AC 72 V	E0		—		
AC 110 V	AC 132 V	F0		—		
AC 125/127 V	AC 150/152 V	L0		—		
AC 230/220 V	AC 277 V	P0 ¹⁾		—		
AC 240 V	AC 288 V	U0		—		
AC 400/380 V	AC 480/460 V	V0 ¹⁾		—		
AC 415 V	AC 500 V	R0		—		
AC 500 V	AC 600 V	S0		—		
Coils for 50/60 Hz						
AC 110 V ... 132 V		—		F7		
AC 200 V ... 240 V		—		M7		
AC 230 V ... 277 V		—		P7 ²⁾		
AC 380 V ... 460 V		—		Q7		
AC 500 V ... 600 V		—		S7		

Coil type		3TY6 503-0B..	3TB50	3TY7 683-0D..	3TF68	
Rated control supply voltage U_s		3TY6 523-0B..	3TB52	3TY7 693-0D..	3TF69	
		3TY6 543-0B..	3TB54			
		3TY6 563-0B..	3TB56			

Rated control supply voltages (changes to 10th and 11th positions of the Order No.)

DC operation


DC 24 V	B4		B4		
DC 30 V	C4		—		
DC 36 V	V4		—		
DC 42 V	D4		—		
DC 48 V	W4		—		
DC 60 V	E4		—		
DC 110 V	F4		F4		
DC 125 V	G4		G4		
DC 180 V	K4		—		
DC 220 V	M4		M4		
DC 230 V	P4		P4		

Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.


1) Coil voltage tolerance at 220 V or 380 V:
0.85 to 1.15 x U_s ;
lower tolerance range limit acc. to
IEC 60 947.

2) Lower tolerance range limit at 220 V:
0.85 x U_s acc. to IEC 60 947.


Coils, AC¹⁾

	Frame Size	Catalog No						
		24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC
 OAS OAS — 3TY6463-0AK6	3TB40–44	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-
	3TB47–48	3TY6483-0AC1	3TY6483-0AK6	3TY6483-0AM1	3TY6483-0AP6	3TY6483-0AP0	3TY6483-0AV0	3TY6483-
	3TB52	—	3TY6523-0AK6	3TY6523-0AM1	3TY6523-0AP6	3TY6523-0AP0	3TY6523-0AV0	
	3TB56	—	—	—	—	3TY6566-0AP0	3TY6566-0AV0	3TY6566-0AS0

Coils, DC

	Frame Size	Catalog No						
		12V DC	24V DC	42V DC	48V DC	110V DC	125V DC	240V DC
 3TY6483-0BB4	3TB40–43	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4
	3TB44	3TY6443-0BA4	3TY6443-0BB4	3TY6443-0BD4	3TY6443-0BW4	3TY6443-0BF4	3TY6443-0BG4	3TY6443-0BQ4
	3TB46	—	—	3TY6463-0BD4	3TY6463-0BW4	3TY6463-0BF4	—	3TY6463-0BQ4
	3TB47–48	—	3TY6483-0BB4	3TY6483-0BD4	3TY6483-0BW4	3TY6483-0BF4	3TY6483-0BG4	—
	3TB50	—	3TY6503-0BB4	3TY6503-0BD4	3TY6503-0BW4	3TY6503-0BF4	3TY6503-0BG4	3TY6503-0BQ4
	3TB52	—	3TY6523-0BB4	3TY6523-0BD4	—	3TY6523-0BF4	3TY6523-0BG4	—
	3TB54	—	3TY6543-0BB4	3TY6543-0BD4	3TY6543-0BW4	3TY6543-0BF4	—	3TY6543-0BQ4
	3TB56	—	3TY6563-0BB4	3TY6563-0BD4	—	3TY6563-0BF4	3TY6563-0BG4	3TY6563-0BQ4
	3TB58	—	—	—	—	—	—	—

Main Contacts (Includes 3 Moving and 6 Fixed Contacts)²⁾

	Frame Size	Catalog No
 3TY6500-0A	3TB40–43	Not Replaceable
	3TB44	3TY6440-0A
	3TB46	3TY6460-0A
	3TB47	3TY6470-0A
	3TB48	3TY6480-0A
	3TB50	3TY6500-0A
	3TB52	3TY6520-0A
	3TB54	3TY6540-0A
	3TB56	3TY6560-0A
	3TB58	3TY6580-0A

Select Complete Catalog Number From Above¹⁾

Old Number	New Number
3TY6465-0A††	3TY6463-0A††
3TY6485-0A††	3TY6483-0A††
3TY6505-0A††	3TY6503-0A††
3TY6525-0A††	3TY6523-0A††
3TY6545-0A††	3TY6543-0A††
3TY6565-0A††	3TY6566-0A††

Coil Voltages

Old Number	New Number
A8	K6
B8	M1
C8	P6
D8	Q0
E8	S0
F8	C1
G8	P0

Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.

1)Some old 3TB coil catalog numbers have been superceded. Cross to current catalog number from these tables.

2)Main contact kits for size 3TB47 and larger include springs. Smaller sizes do not.

Contactors and Contactor Assemblies

3TF World Series Contactors

SIRIUS



Spare parts

Coils, AC Type 3TF and CRLtF



3TY7403-0AK6



3TY7483-0AK6

Frame Size	Catalog No							
	24V AC, 60Hz 24V AC, 50Hz	120V AC, 60Hz 110V AC, 50Hz	208V AC, 60Hz 173V AC, 50Hz	240V AC, 60Hz 220V AC, 50Hz	277V AC, 60Hz 220V AC, 50Hz	460V AC, 60Hz 380V AC, 50Hz	600V AC, 60Hz 500V AC, 50Hz	
3TF40-43	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0	
3TF34-35, 3TF44-45	3TY7443-0AC2	3TY7443-0AK6	3TY7443-0AM1	3TY7443-0AP6	3TY7443-0AU1	3TY7443-0AV0	3TY7443-0AS0	
3TF46-47	3TY7463-0AC2	3TY7463-0AK6	3TY7463-0AM1	3TY7463-0AP6	3TY7463-0AU1	3TY7463-0AV0	3TY7463-0AS0	
3TF48-49	3TY7483-0AC2	3TY7483-0AK6	3TY7483-0AM1	3TY7483-0AP6	3TY7483-0AU1	3TY7483-0AV0	3TY7483-0AS0	
3TF50-51	3TY7503-0AC2	3TY7503-0AK6	3TY7503-0AM1	3TY7503-0AP6	3TY7503-0AU1	3TY7503-0AV0	3TY7503-0AS0	
3TF52-53	3TY7523-0AC2	3TY7523-0AK6	3TY7523-0AM1	3TY7523-0AP6	3TY7523-0AU1	3TY7523-0AV0	3TY7523-0AS0	
3TF54-55	3TY7543-0AC2	3TY7543-0AK6	3TY7543-0AM1	3TY7543-0AP6	3TY7543-0AU1	3TY7543-0AV0	3TY7543-0AS0	
3TF56	3TY7563-0AC2	3TY7563-0AK6	3TY7563-0AM1	3TY7563-0AP6	3TY7563-0AU1	3TY7563-0AV0	3TY7563-0AS0	
3TF57	—	3TY7573-0CF7	—	3TY7573-0CM7	—	3TY7573-0CQ7	—	
3TF68	—	3TY7683-0CF7	—	3TY7683-0CM7	—	3TY7683-0CQ7	3TY7683-0CS7	
3TF69	—	3TY7693-0CF7	—	3TY7693-0CM7	—	3TY7693-0CQ7	3TY7693-0CS7	

Coils, DC Type 3TF and CRLtF



3TY4803-0BB4

Frame Size	Catalog No							
	12V DC	24V DC	42V DC	48V DC	110V DC	125V DC	240V DC	
DC Solenoid								
3TF30-33 3TF40-43	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4	
3TF34-35, 3TF44-45	3TY7443-0BA4	3TY7443-0BB4	3TY7443-0BD4	3TY7443-0BW4	3TY7443-0BF4	3TY7443-0BG4	—	
3TF46-47	—	3TY7463-0BB4	3TY7463-0BD4	3TY7463-0BW4	—	3TY7463-0BG4	3TY7463-0BQ4	
DC Economy Circuit (Replacement coils only. Does not include interlock or interposing relay.)								
3TF46-47	—	3TY7463-0DB4	3TY7463-0DD4	3TY7463-0DW4	3TY7463-0DF4	3TY7463-0DG4	3TY7463-0DQ4	
3TF48-49	—	—	3TY7483-0DD4	3TY7483-0DW4	3TY7483-0DF4	3TY7483-0DG4	3TY7483-0DQ4	
3TF50-51	—	3TY7503-0DB4	3TY7503-0DD4	3TY7503-0DW4	3TY7503-0DF4	3TY7503-0DG4	3TY7503-0DQ4	
3TF52-53	—	3TY7523-0DB4	3TY7523-0DD4	3TY7523-0DW4	3TY7523-0DF4	3TY7523-0DG4	3TY7523-0DQ4	
3TF54-55	—	—	3TY7543-0DD4	3TY7543-0DW4	3TY7543-0DF4	3TY7543-0DG4	3TY7543-0DQ4	
3TF56	—	3TY7563-0DB4	3TY7563-0DD4	3TY7563-0DW4	—	3TY7563-0DG4	3TY7563-0DQ4	
3TF57	—	3TY7573-0DB4	3TY7573-0DD4	3TY7573-0DW4	3TY7573-0DF4	3TY7573-0DG4	3TY7573-0DQ4	
3TF68	—	3TY7683-0DB4	—	—	3TY7683-0DF4	—	—	

Main Contacts (Includes 3 Moving and 6 Fixed Contacts)



3TY7460-0A

Frame Size	Catalog No	List Price \$
3TF30-35	Not Replaceable	
3TF40-43	Not Replaceable	
3TF44	3TY7440-0A	
3TF45	3TY7450-0A	
3TF46	3TY7460-0A	
3TF47	3TY7470-0A	
3TF48	3TY7480-0A	
3TF49	3TY7490-0A	
3TF50	3TY7500-0A	
3TF51	3TY7510-0A	
3TF52	3TY7520-0A	
3TF53	3TY7530-0A	
3TF54	3TY7540-0A	
3TF55	3TY7550-0A	
3TF56	3TY7560-0A	
3TF57	3TY7570-0A	
3TF68	3TY7680-0B ¹⁾	
3TF69	3TY7690-0B ¹⁾	

Arc Chutes




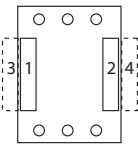
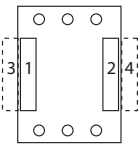
3TY7482-0A

Frame Size	Catalog No
3TF30-35	Not Replaceable
3TF40-43	Not Replaceable
3TF44	3TY7442-0A
3TF45	3TY7452-0A
3TF46	3TY7462-0A
3TF47	3TY7472-0A
3TF48	3TY7482-0A
3TF50	3TY7502-0A
3TF51	3TY7512-0A
3TF52	3TY7522-0A
3TF53	3TY7532-0A
3TF54	3TY7542-0A
3TF55	3TY7552-0A
3TF56	3TY7562-0A
3TF57	3TY7572-0A
3TF68	Not Available
3TF69	Not Available

Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.

1) Vacuum bottles with mounting hardware.

Auxiliary Contact Blocks

Illustration	Frame Size	Auxiliary Contacts		NO/Early Make	NC/Early Break	Auxiliary Contact Mounting Position	Position	Block Location	Obsolete Catalog No	Current Catalog
		NO	NC							
	3TF30 to 3TF35, 3TH3	1	—	—	—	—	—	Top	—	3TX4010-2A
		—	1	—	—	—	—	Top	—	3TX4001-2A
		—	—	1	—	—	—	Top	—	3TX4010-4A
		—	—	—	1	—	—	Top	—	3TX4001-4A
	3TF40 to 3TF43	Not Replaceable					—	—	—	—
	3TF44 to 3TF68	1	1	—	—		1	Left	3TY7561-1A	3TY7561-1AA00
		1	1	—	—		2	Right	3TY7561-1B	3TY7561-1AA00
		1	—	—	1		4	Right	3TY7561-1K	3TY7561-1EA00
	3TF46 to 3TF68	1	1	—	—		3	Left	3TY7561-1K	3TY7561-1KA00
	2nd Aux Contact Block	1	1	—	—		4	Right	3TY7561-1L	3TY7561-1KA00
		1	1	—	—		3	Left	3TY7561-1U	3TY7561-1UA00
	For Electronic Circuits	1	1	—	—		4	Right	3TY7561-1V	3TY7561-1UA00

Mechanical Interlocks



3TX7466-1A

Frame Size	Catalog No
3TF44-54	3TX7466-1A

Arc Chutes



3TY6462-0A

Type	Frame Size	Catalog No	List Price \$	Frame Size	Catalog No
3TB	3TB40-43	Not Replaceable	—	3TB50	3TY6502-0A
	3TB44	—	—	3TB52	3TY6522-0A
	3TB46	—	—	3TB54	3TY6542-0A
	3TB47	—	—	3TB56	3TY6562-0A
	3TB48	3TY6482-0A	—	3TB58	—

Control Relays, Type 3TH3, 3TH4 Coils, AC



3TY7403-0AK6

Type	Frame Size	Catalog No						
		24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC
3TH	3TH30-33 3TH40-43	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0

Coils, DC

Type	Frame Size	Catalog No						
		12V DC	24V DC	42V DC	48V DC	110V DC	125V DC	240V DC
3TH	3TH30-33 3TH40-43	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4

Auxiliary Contact Blocks¹⁾

Type	Frame Size	Auxiliary Contacts		Normally Open/ Early Make	Normally Closed/ Late Break	Block Location	Catalog No
		NO	NC				
3TH	3TH3	1	—	—	—	Top	3TX4010-2A
		—	1	—	—	Top	3TX4001-2A
		—	—	1	—	Top	3TX4010-4A
		—	—	—	1	Top	3TX4001-4A

Control Relays, Type 3TH8 Coils, AC

Type	Frame Size	Catalog No						
		24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC
3TH	3TH80-83	3TY7403-0AC2	3TY7403-0AK6	3TY7403-0AM1	3TY7403-0AP6	3TY7403-0AU1	3TY7403-0AV0	3TY7403-0AS0

Coils, DC

Type	Frame Size	Catalog No						
		12V AC	24V AC	42V AC	48V AC	110V AC	125V AC	240V AC
3TH	3TH80-83	3TY4803-0BA4	3TY4803-0BB4	3TY4803-0BD4	3TY4803-0BW4	3TY4803-0BF4	3TY4803-0BG4	3TY4803-0BQ4

Due to the mature nature of some product series, supply cannot be guaranteed on all versions listed on this page.

1) Maximum 4 blocks per relay.

Contactors for Switching Motors



3RT contactors, 3-pole, sizes S00 to S3

AC and DC operation

IEC 60 947, EN 60 947
(VDE 0660), UL 508

Design

The 3RT contactors are suitable for use in any climate. They are safe from touch to DIN VDE 0106 Part 100.

The 3RT contactors are available screw, spring-type, or ring lug connections.

An auxiliary contact is integrated in the basic unit of size S00 contactors. The basic units of sizes S0 to S3 only contain the main conducting paths.

All the basic units can be extended with auxiliary switch blocks. Cabinet units with 2 NO + 2 NC (terminal designations acc. to EN 50 012) are available as of size S0; the auxiliary switch block is removable.

The size S3 contactors have removable box terminals for the main conductor connections. Ring cable lugs or bars can thus also be connected.

Contact reliability

If voltages ≤ 110 V and currents ≤ 100 mA are to be switched, the auxiliary contacts of 3RT contactors and 3RH contactor relays should be used to ensure good contact stability.

These auxiliary contacts are suitable for electronic circuits with currents ≥ 1 mA at a voltage of 17 V.

Short-circuit protection of contactors

For the short-circuit protection of contactors without an overload relay, see the technical data.

For the short-circuit protection of contactors with an overload relay, see section 3.

Motor protection

3RU overload relays can be mounted onto the 3RT contactors for protection against overloads. The overload relays must be ordered separately (see section 3).

Surge suppression

The 3RT contactors can be retrofitted with RC elements, varistors, diodes or diode assemblies (combination of an interference suppression diode and a Zener diode for short tripping times) for suppressing opening surges in the coil.

The surge suppressors are plugged onto the front of size S00 contactors. Space is provided for them next to a snap-on auxiliary switch block.

With all size S0 to S3 contactors, varistors and RC elements can be plugged on directly at the coil terminals, either on the top or underneath. Diode assemblies are available in two different designs with different polarities. Depending on the application, they can be attached either only on the bottom (assembly with circuit-breaker) or only on the top (assembly with overload relay).

The plug-in direction of the diodes and diode assemblies is determined by a coding device. Exceptions: 3RT29 26-1E.00 and 3RT19 36-1T.00; in these cases the plug-in direction is identified by "+" and "-".

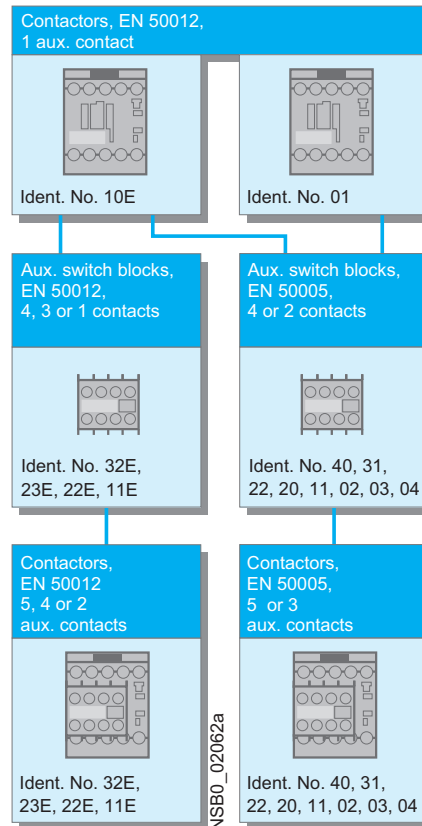
Coupling relays are supplied either without surge suppression or with a varistor or diode connected as standard, according to the design.

Note

The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks (interference suppression diode 6 to 10 times; diode assemblies 2 to 6 times; varistor +2 ms to 5 ms).

3RT20 1. contactors (size S00),

Terminal designations acc. to EN 50 012 or DIN 50 005.



Auxiliary switch blocks

The 3RT basic units can be extended with various auxiliary switch blocks, depending on the application:

Size S00 (3RT201)

Contactors with one NO contact as the auxiliary contact and with either screw or spring-type connections, identification number 10E, can be extended to obtain contactors with 2, 4 or 5 auxiliary contacts in accordance with EN 50 012 using auxiliary switch blocks. The identification numbers 11E, 22E, 23E and 32E on the auxiliary switch blocks apply to the complete contactors. These auxiliary switch blocks cannot be combined with contactors that have an NC contact in their basic unit, identification number 01, as these are coded.

All size S00 contactors with one auxiliary contact, identification number 10E or 01, and the contactors with 4 main contacts can be extended to obtain contactors with 3 or 5 auxiliary contacts (contactors with 4 main contacts: 2 or 4 auxiliary contacts) according to EN 50 005 using auxiliary switch blocks

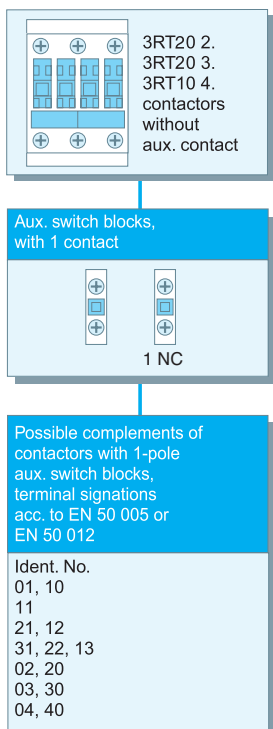
with identification numbers 40 to 02. The identification numbers on the auxiliary switch blocks apply only to the attached auxiliary contacts.

Single or 2-pole auxiliary switch blocks that can be connected on either the top or the bottom facilitate quick, straightforward wiring, especially when assembling feeders. These auxiliary switch blocks are only available with screw-type terminals.

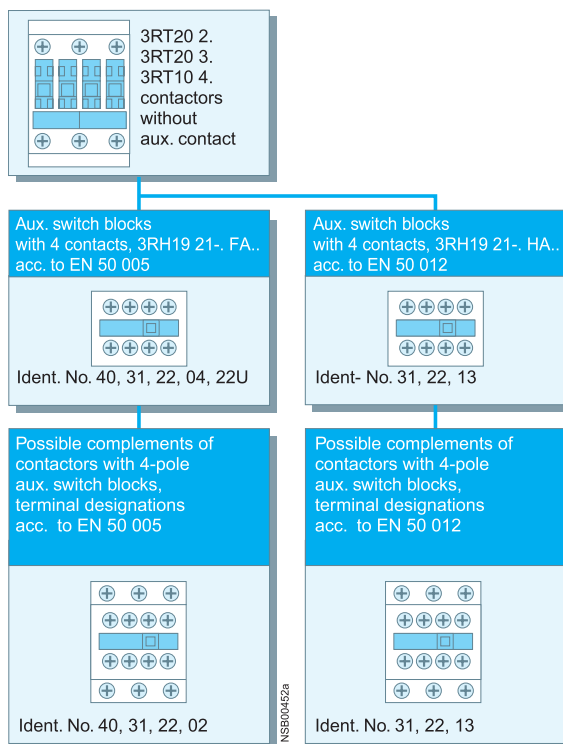
The solid-state compatible 3RH29 11-1NF... auxiliary switch blocks for size S00 contactors contain two enclosed contact elements. They are ideal for switching low voltages and currents (hard gold-plated contacts) or for use in dusty atmosphere. The contacts do not have positively-driven operation.

All the above-mentioned auxiliary switch variants can be snapped into the location holes on the front of the contactors. The auxiliary switch block has a centrally positioned release lever for disassembly.

3RT20 2. to 3RT10 4. contactors (sizes S0 to S3), single-pole auxiliary switch blocks,
terminal designations acc. to EN 50 005 or EN 50 012.



3RT20 2. to 3RT10 4. contactors (sizes S0 to S3), single-pole auxiliary switch blocks,
terminal designations acc. to EN 50 005 or EN 50 012.



Sizes S0 to S3 (3RT202 to 3RT104)

An extensive range of auxiliary switch blocks is available for various applications. The contactors themselves do not have an integrated auxiliary conducting path.

The auxiliary switch variants are identical for all size S0 to S3 contactors.

One 4-pole or up to four single-pole auxiliary switch blocks (with screw or spring-type connections) can be snapped onto the front of the contactors. When the contactors are energized, the NC contacts open before the NO contacts close.

The terminal designations of the single-pole auxiliary switch blocks consist of location digits on the basic unit and function digits on the auxiliary switch blocks.

In addition, 2-pole auxiliary switch blocks (screw-type terminals) are provided for cable entries from above or below in the style of a four-conductor block (feeder auxiliary switch).

If the available installation depth is restricted, 2-pole auxiliary switch blocks (screw or spring-type connections) can be mounted laterally on the left or right.

The auxiliary switch blocks designed for mounting onto the front can be disassembled with the aid of a centrally positioned release lever; the laterally mountable auxiliary switch blocks can be removed easily by pressing on the fluted grips.

The terminal designations of the individual auxiliary switch blocks comply with EN 50 005 or EN 50 012, while those of the complete contactors with an auxiliary switch block with 2 NO + 2 NC comply with EN 50 012.

The laterally mountable auxiliary switch blocks to EN 50 012 can only be used if no 4-pole auxiliary switch blocks are snapped onto the front. If single-pole auxiliary switch blocks are used in addition, the location digits on the contactor must be noted.

Two enclosed contact elements and two standard contact elements are available for the 3RH29 21-.FE22 solid-state compatible auxiliary switch block mountable on the front. The laterally mountable 3RH29 21-2DE11 solid-state compatible auxiliary switch block contains 2 enclosed contact elements (1 NO + 1 NC). The enclosed contact elements are ideal for switching low voltages and currents (hard gold-plated contacts) or for use in a dusty atmosphere. The contacts are positively driven.

Sizes S0 and S2 (3RT202 and 3RT203)

Up to four auxiliary contacts can be mounted, whereby any design of the auxiliary switch blocks is permitted. If two 2-pole, laterally mounted, auxiliary switch blocks are used, one must be mounted on the left and one on the right for the sake of symmetry.

Under certain circumstances, more auxiliary contacts are allowed for size S2 (please ask for details).

With regard to 3RT13/23 and 3RT15/25 4-pole contactors, please refer to pages 2/12 to 2/14.

Sizes S3 to S12 (3RT104 to 3RT107)

Up to eight auxiliary contacts can be mounted, whereby the following points must be noted:

- Of these eight auxiliary contacts, no more than four must be NC contacts.
- If laterally mounted auxiliary switch blocks are used, they must be symmetrical.

With regard to 3RT13 and 3RT15 4-pole contactors, please refer to pages 2/11 to 2/13.

Contactors and Contactor Assemblies

Contactors for Switching Motors

SIRIUS



3RT1 contactors, 3-pole, sizes S6 to S12

Overview

Design

- 3RT10 contactors for switching motors
- 3RT12 vacuum contactors for switching motors
- 3RT14 contactors for AC-1 applications

Operating mechanism

Two types of solenoid-operated mechanism are available:

- Conventional operating mechanism
- Solid-state operating mechanism (with 3 performance levels)

UC operation

The contactors can be AC (40 to 60 Hz) and DC driven.

Withdrawable coils

To allow easy coil changing, for example if the application is changed, the magnetic coil can be pulled out upwards without tools after the release mechanism has been actuated, and can be replaced by any other required coil of the same size.

Auxiliary contact complement

The contactors can be equipped with a maximum of 8 auxiliary contacts, with identical auxiliary switch blocks from S0 to S12. Of these, no more than 4 are permitted to be NC contacts.

- 3RT10 and 3RT14 contactors: auxiliary contacts mounted laterally and on front
- 3RT12 vacuum contactors: auxiliary contact mounted laterally

Contactors with conventional operating mechanism

3RT1...-A:

The magnetic coil is switched on and off directly with the control supply voltage U_s via terminals A1/A2.

Multi-voltage range for the control supply voltage U_s : Several closely adjacent control supply voltages, available around the world, are covered by just one coil, for example UC 110-115-120-127 V or UC 220-230-240 V.

In addition, allowance is also made for a coil voltage tolerance of 0.8 times the lower rated control supply voltage ($U_{s\min}$) and 1.1 times the upper rated control supply voltage ($U_{s\max}$), within which the

contactor switches reliably and no thermal overloading occurs.

Contactors with solid-state operating mechanism

The power required for reliable switching and holding is supplied selectively to the magnetic coil by series-connected control electronics.

Features:

- Extended voltage range for the control supply voltage U_s :

Compared with the conventional operating mechanism, the solid-state operating mechanism covers an even broader range of globally available control supply voltages within one coil variant. For example, the globally available voltages 200-208-220-230-240-254-277 V are covered with the coil for UC 200 to 277 V ($U_{s\min}$ to $U_{s\max}$).

- Extended coil voltage tolerance 0.7 to $1.25 \times U_s$:

On account of the broad range for the rated control supply voltage and the additionally allowed coil voltage tolerance of $0.8 \times U_{s\min}$ to $1.1 \times U_{s\max}$, an extended coil voltage tolerance of at least 0.7 to $1.25 \times U_s$, within which the contactors will operate reliably, is available for the most common control supply voltages of 24, 110 and 230 V.

- Bridging short-time voltage dips:

Control voltage failures dipping to 0 V (at A1/A2) are bridged for up to approx. 25 ms, therefore preventing unintentional disconnection.

- Defined ON and OFF thresholds:

As of voltages $\geq 0.8 \times U_{s\min}$, the electronics reliably switch the contactor on and as of $\leq 0.5 \times U_{s\min}$ it is reliably switched off. The differential travel in the switching thresholds prevents chattering of the main contacts and hence increased wear or welding when operated in weak, unstable networks. Similarly, thermal overloading of the contactor coil is prevented if the voltage applied is too low – the contactor is not switched on and is operated with overexcitation.

- Low control power consumption when closing and in closed state.

Electromagnetic compatibility (EMC)

The contactors with solid-state operating mechanism conform to the requirements for operation in industrial plants.

• Noise immunity

- Burst (IEC 61 000-4-4): 4 kV
- Surge (IEC 61 000-4-5): 4 kV
- Electrostatic discharge, ESD (IEC 61 000-4-2): 8/15 kV
- Electromagnetic field (IEC 61 000-4-3): 10 V/m

• Emitted interference

- Limiting value class A to EN 55 011

Note:

In connection with converters, the control cables should be installed separately from the load cables to the converter.

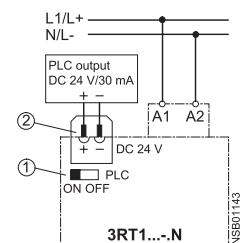
3RT1...-N: for DC 24 V PLC output

2 control options:

- Control without an interface directly via a DC 24 V ≥ 30 mA PLC output (EN 61 131-2). Connection via a 2-pole plug-in connection; the connector, using screwless spring-force technology, is included in the scope of supply. The control supply voltage for supplying power to the solenoid operating mechanism must be connected to A1/A2.

Note:

Before start-up, the sliding-dolly switch for PLC operation must be moved to the "PLC ON" position (setting ex works: "PLC OFF").

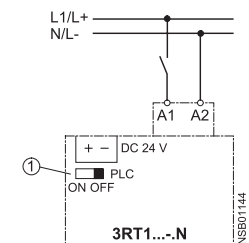


- ① Sliding-dolly switch, must be in PLC "ON" position
- ② Plug-in connection, 2-pole

- Conventional control by applying the control supply voltage at A1/A2 via a switching contact.

Note:

The sliding-dolly switch must be in the "PLC OFF" position (= setting ex works).



- ① Sliding-dolly switch, must be in PLC "OFF" position

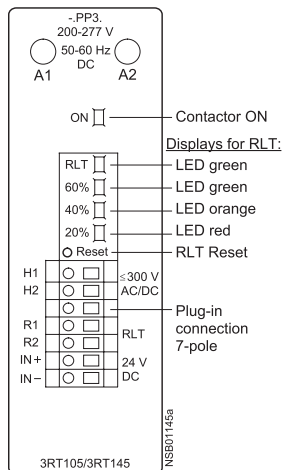


Overview

Contactors with solid-state operating mechanism

3RT1...-P: for DC 24 V PLC output or PLC relay output, with indication of remaining lifetime

(Indication of remaining lifetime RLT: see 2/69.)



To supply power to the solenoid operating mechanism and the remaining lifetime indication, the control supply voltage U_c must be run to terminals A1/A2 of the laterally mounted electronics module. The control inputs of the contactor are brought out to a 7-pole plug-in connection; the connector, using screwless spring-force technology, is included in the scope of supply.

- The remaining lifetime RLT status signal is available at terminals R1/R2 via a floating relay contact (hard gold-plated, enclosed) and can be processed for example via SIMOCODE-DP or PLC inputs or elsewhere.

Permissible current carrying capacity of relay output R1/R2:

- I_{th}/AC -15/24 to 230 V: 3 A
- I_{th}/DC -13/24 V: 1 A

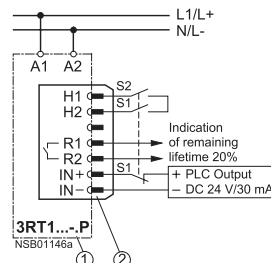
LED indicators

The following statuses are indicated by LEDs on the laterally mounted electronics module:

- Contactor ON (energized state): Green LED ("ON")
- Indication of remaining lifetime (see 2/69)

2 control options:

- Contactor control without an interface directly via a DC 24 V ≥ 30 mA PLC output (EN 61 131-2) via terminals IN+/IN-.



Electronics module of 3RT1...-P contactor

Plug-in connection, 7-pole

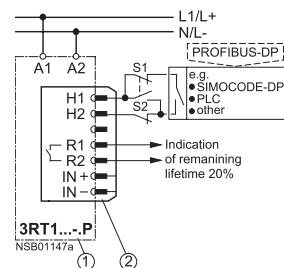
S1 Changeover switch from automatic control via PLC semiconductor output to local control

S2 Local control option

Possibility of switching from automatic control to local control via terminals H1/H2, i.e. automatic control via a PLC or SIMOCODE-DP/PROFIBUS-DP can be deactivated, for example during start-up or in the event of a fault, and the contactor can be controlled manually.

- Contactor control via relay outputs, e.g. by
 - PLC
 - SIMOCODE-DP 3UF5 via terminals H1/H2.

Contact loading:
 U_g /approx. 5 mA.



Electronics module of 3RT1...-P contactor

Plug-in connection, 7-pole

S1 Changeover switch from automatic control, e.g. via SIMOCODE-DP or PLC relay output to local control

S2 Local control option

3RT12 vacuum contactors

In contrast with the 3RT10 contactors – the main contacts operate in air under atmospheric conditions – the contact gaps of the 3RT12 vacuum contactors are contained in hermetically enclosed vacuum contact tubes. Neither arcs nor arcing gases are produced. The particular benefit of 3RT12 vacuum contactors, however, is that their electrical endurance is at least twice as long as that of 3RT10 contactors.

They are therefore particularly well suited to frequent switching in jogging/mixed operation, for example in crane control systems.

Advantages:

- Very long electrical endurance
- High short-time current-carrying capacity for heavy starting
- No open arcs, no arcing gases, i.e. no minimum clearances from earthed parts required either
- Longer maintenance intervals
- Increased plant availability

Notes on operation:

- Switching motors with rated operational voltages U_e > 500 V:

In order to damp overvoltages and protect the motor winding insulation against multiple reignition when switching off three-phase motors, it is recommended to fit the contactors on the outgoing side (T1/T2/T3) with the 3RT19 66-1PV surge suppression module – RC varistor – (accessory).

This additional equipment is not required for operation in circuits with converters. It might be damaged by the voltage peaks and harmonics generated.

- Switching DC voltage: Vacuum contactors are basically unsuitable for switching DC voltage.

Contactors and Contactor Assemblies

Contactor Assemblies for Switching Motors

Contactor assemblies for WYE-delta starting

• Revised •
10/22/15



Overview

The contactor assemblies for star-delta starting can be ordered as follows:

- Sizes S00-S0 as assemblies. (see pages 2/47-2/48)
- Sizes S2-S12 as components for customer assembly

Calculated horsepower ratings at 460 V AC				Size			Accessories for customer assembly
HP	Operat. current I_e A	Motor current A		Line/delta contactor	WYE contactor		Time-delay relay Installation kit A double infeed
30	50	9.5 ... 13.8 12.1 ... 17.2 15.5 ... 21.5 19 ... 27.6 24.1 ... 34 31 ... 43 37.9 ... 55.2 48.3 ... 65		S2-S2-S0	3RT20 28	3RT20 26	3RP15 74-1N.30 3RA19 33-2C ³⁾
50	80	62.1 ... 77.8		S2-S2-S2	3RT29 35	3RT10 34	3RA19 33-2B ³⁾
60	86	69 ... 86			3RT20 36		
75	115	31 ... 43.1 37.9 ... 55.2 48.3 ... 69 62.1 ... 77.6 77.6 ... 108.6		S3-S3-S2	3RT10 44	3RT10 35	3RP15 74-1N.30 3RA19 43-2C ³⁾
100	150	98.3 ... 129.3 120.7 ... 150			3RT10 45	3RT10 36	
125	160	86 ... 160		S6-S6-S3	3RT10 54	3RT10 44	3RP15 74-1N.30
150	195	86 ... 195					
190	230	86 ... 230			3RT10 55	3RT10 45	
200	280	86 ... 280			3RT10 56	3RT10 46	
250	350	95 ... 350		S10-S10-S6	3RT10 64	3RT10 54	3RP15 74-1N.30
300	430	95 ... 430			3RT10 65	3RT10 56	
400	540	347 ... 540		S12-S12-S10	3RT10 75	3RT10 64	3RP15 74-1N.30
450	610	347 ... 610					
500	690	347 ... 690				3RT10 65	
650	850	347 ... 850			3RT10 76	3RT10 66	

For accessories, see page 2/83.
For circuit diagrams, see page 2/200.

1) The installation kit contains mechanical interlock; 3 connecting clips; wiring connectors on the top (connection between line contactor and delta contactor) and the bottom (connection between delta contactor and star contactor); WYE jumper.

2) The installation kit contains 5 connecting clips; wiring connectors on the top (connection between line contactor and delta contactor) and the bottom (connection between delta contactor and WYE contactor); star jumper.



Contactors and Contactor Assemblies

Contactor Assemblies for Switching Motors

Contactor assemblies for WYE-delta starting

1

2

			Overload relay, thermal		Overload relay, solid-state	
Installation kit B for single infeed	WYE jumper	Baseplates	Range of overload relay, thermal [A]	Order No. overload relay, thermal	Range of overload relay, solid-state [A]	Order No. overload relay, solid-state
3RA19 33-3D ⁴⁾	3RT19 26-4BA31	3RA19 32-2E	5.5 ... 8	3RU11 36-1HB0	6 ... 25	3RB20 36-1QB0
			7 ... 10	3RU11 36-1JB0		
			9 ... 12.5	3RU11 36-1KB0		
			11 ... 16	3RU11 36-4AB0		
			14 ... 20	3RU11 36-4BB0		
			18 ... 25	3RU11 36-4DB0		
			22 ... 32	3RU11 36-4EB0	13 ... 50	3RB20 36-1UB0
			28 ... 40	3RU11 36-4FB0		
			36 ... 45	3RU11 36-4GB0		
			40 ... 50	3RU11 36-4HB0		
3RA19 43-3D ⁴⁾	3RT19 36-4BA31	3RA19 42-2E	18 ... 25	3RU11 46-4DB0	13 ... 50	3RB20 46-1UB0
			22 ... 32	3RU11 46-4EB0		
			28 ... 40	3RU11 46-4FB0		
			36 ... 45	3RU11 46-4HB0		
			45 ... 63	3RU11 46-4JB0	25 ... 100	3RB20 46-1EB0
			57 ... 75	3RU11 46-4KB0		
			70 ... 90	3RU11 46-4LB0		
3RA19 53-3D ⁵⁾	3RT19 46-4BA31	3RA19 52-2E	–	–	50 ... 200	3RB20 56-1FG0

3) Installation kit contains wiring connector on the bottom (connection between delta contactor and WYE contactor) and WYE jumper.

4) Wiring connector on top from reversing contactor assembly (note conductor cross-sections).

5) A mechanical interlock adapter, 3RA1954-2C, is required to use the standard 3RA1954-2A mechanical interlock for the AC version of the S6-S6-S3 WYE-Delta starter. The S6-S6-S3 WYE-Delta DC version would require a special custom build spacer, which is not manufac-

tured, to allow the mechanical interlock to operate.

6) Only use wiring connector on the top from reversing contactor assembly (note conductor cross-sections); order WYE jumper in addition.



Application

WYE-delta starting can only be used either if the motor normally operates in a Δ (delta) connection or starts softly or if the load torque during Υ starting is low and does not increase sharply. On the Υ step the motors can carry approximately 50% (class KL 16) or 30% (class KL 10) of their rated torque; the starting torque is approximately $\frac{1}{3}$ of that during direct on-line starting. The starting current is approximately 2 to 2.7 times the rated motor current.

The changeover from Υ to Δ must not be effected until the motor has run up to rated speed. Drives which require this changeover to be performed earlier are unsuitable for WYE-delta starting.

The ratings given in the above table are only applicable to motors with a starting current ratio of $I_A \leq 8.4 \times I_N$ and using either a 3RT19 16-2G or 3RT19 26-2G solid-state time-delay auxiliary switch block with a WYE-delta function or a 3RP1574 WYE-delta time-delay relay with a dead interval of approximately 50 ms on reversing.

For the circuit diagrams for the main and control circuits, see page 2/161. The size selected for the installation kits for WYE-delta starting is determined by the line contactor.

Design

Components for customer assembly

Installation kits with wiring connectors and, if necessary, mechanical connectors are available for contactor assemblies for WYE-delta starting. Contactors, overload relays, star-delta time-delay relays and auxiliary switches for the electrical interlock – if required also feeder terminals, mechanical interlocks ¹⁾ and baseplates – must be ordered separately.

The wiring installation kits for sizes S00 and S0 contain the top and bottom main conducting path connections between the line and delta contactors (top) and between the delta and WYE contactors (bottom).

In the case of sizes S2 to S12 only the bottom main conducting path connection between the delta and WYE contactors is included in the wiring connector, owing to the larger conductor cross-section at the infeed.

Motor protection

Overload relays or thermistor motor protection tripping units can be used for overload protection.

The overload relay can be either mounted onto the line contactor or separately fitted. It must be set to 0.58 times the rated motor current.

Surge suppression

Sizes S00 to S3

All contactor assemblies can be fitted with RC elements, varistors or diode assemblies for damping opening surges in the coil.

As with the individual contactors, the surge suppressors can either be plugged onto the top of the contactors (S00) or fitted onto the coil terminals on the top or bottom (S0 to S3).

Sizes S6 to S12

The contactors are fitted with varistors as standard.

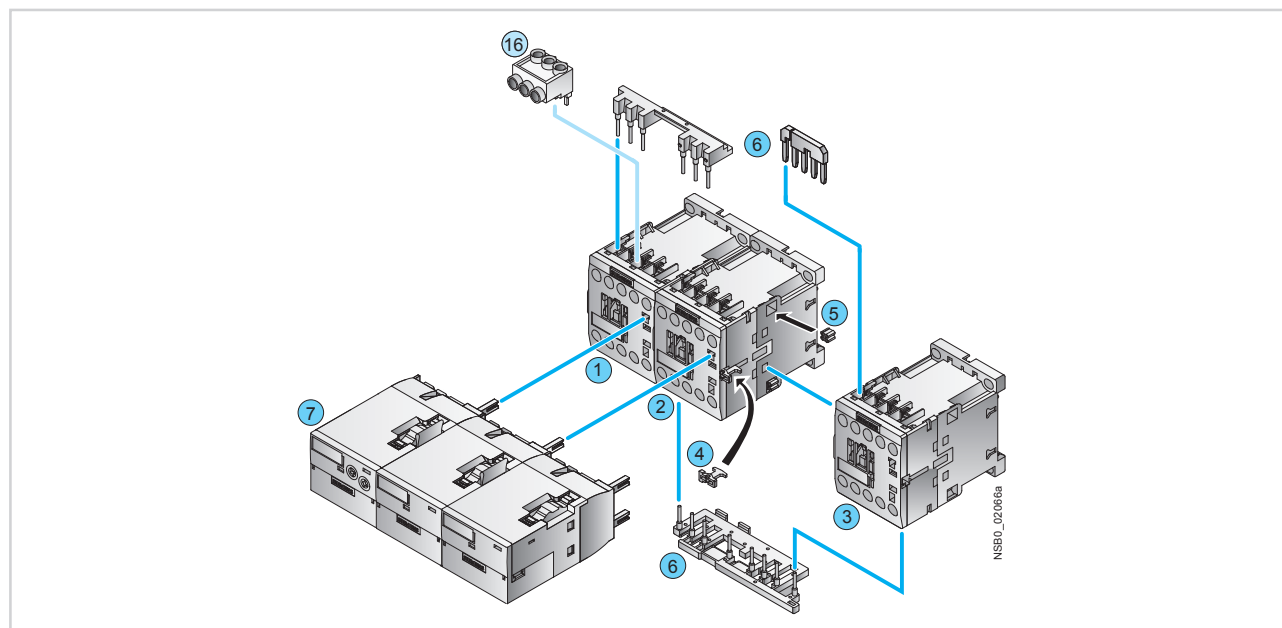
1) Exception:
The mechanical interlock between the delta and WYE contactors is included in the installation kit for size S00 contactor assemblies.



Selection and ordering data

Fully wired and tested contactor assemblies · Size S00-S00-S00 · Up to 11 kW

The figure shows the version with screw terminals



Mountable accessories

Individual parts	Order No.	Page
⑯ Three-phase feeder terminal ³⁾	3RA29 13-3K	2/83

¹⁾ Use version with 1 NO.

²⁾ Use version with 1 NC.

³⁾ Part ⑯ can only be mounted with contactors with screw terminal.

Fully wired and tested contactor assemblies

Individual parts	Order No.			Page
	Q11 ¹⁾	Q13 ²⁾	Q12 ²⁾	
① ② ③ Contactor, 5.5 kW	3RT20 15	3RT20 15	3RT20 15	2/8
① ② ③ Contactor, 7.5 kW	3RT20 17	3RT20 17	3RT20 15	2/8
① ② ③ Contactor, 11 kW	3RT20 18	3RT20 18	3RT20 16	2/8
④ ⑤ ⑥ Assembly kit comprising	3RA29 13-2BB1			2/83
④ Mechanical interlock				
⑤ 4 connecting clips				
⑥ Wiring modules on the top and bottom for connecting the main current paths				
⑦ Function modules for wye-delta starting	3RA28 16-0EW20			2/27

Note:

When the function modules for contactor assemblies for wye-delta starting are used, no other auxiliary switches are allowed to be mounted on the basic units.

Contactor and Contactor Assemblies

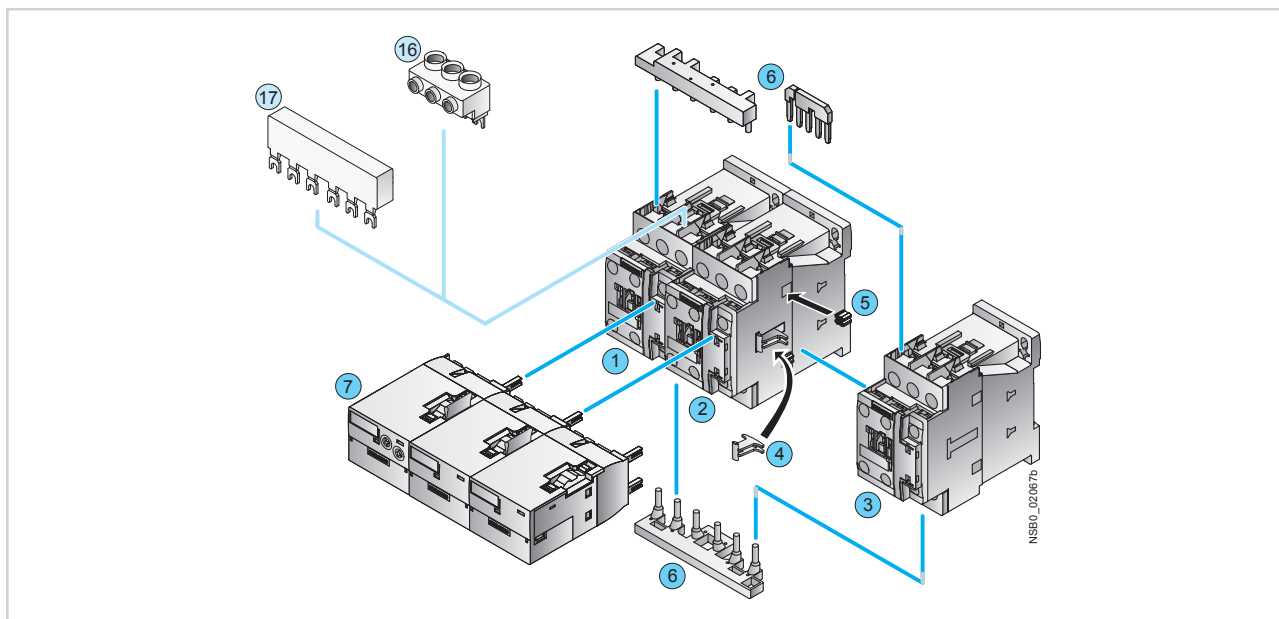
Contactor Assemblies for Switching Motors

Contactor assemblies for WYE-delta starting



Fully wired and tested contactor assemblies · Size S0-S0-S0 · Up to 22 kW

The figure shows the version with screw terminals



Mountable accessories

Individual parts	Order No.	Page
16 Three-phase feeder terminal ¹⁾	3RV29 25-5AB	2/83
17 Three-phase busbar ¹⁾	3RV19 15-1AB	1/8

¹⁾ The parts 16 and 17 can only be mounted with contactors with screw terminal.

Fully wired and tested contactor assemblies

Individual parts	Order No.			Page
	Q11	Q13	Q12	
①②③ Contactor, 11 kW	3RT20 24	3RT20 24	3RT20 24	2/8
①②③ Contactors, 15/18.5 kW	3RT20 26	3RT20 26	3RT20 24	2/8
①②③ Contactor, 22 kW	3RT20 27	3RT20 27	3RT20 26	2/8
④⑤⑥ Assembly kit	3RA29 23-2BB1			2/83
The assembly kit contains:				
④ Mechanical interlock				
⑤ Connecting clips				
⑥ Wiring modules on the top and bottom for connecting the main current paths				
⑦ Function modules for wye-delta starting	3RA28 16-0EW20			2/27

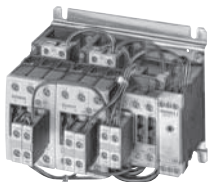
Note:

When the function modules for contactor assemblies for wye-delta starting are used, no other auxiliary switches are allowed to be mounted on the basic units.

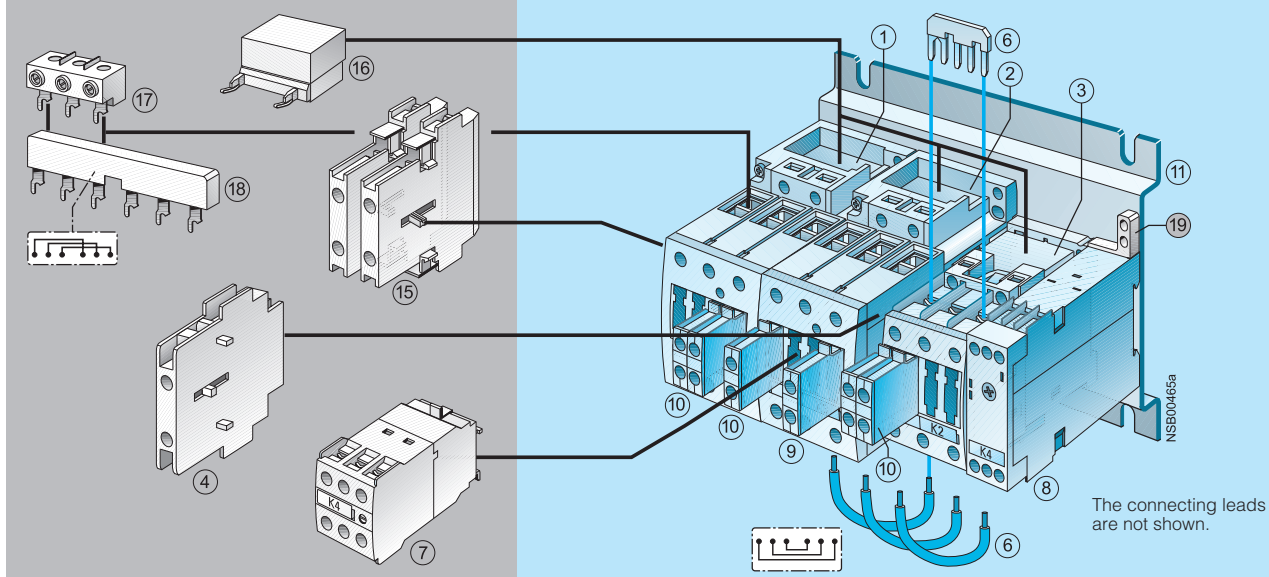


Selection and ordering data

Size S2-S2-S0 · up to 65 A, 30 HP



Components to be ordered separately:



Accessory	Order No.	Page	Components	Order No.			Page
				K1	K3	K2	
④ Mechanical interlock, laterally mountable, depth must be adapted K3: 1.5 mm; K2: 0 mm	3RA19 24-2B	2/80	①②③ Contactors, 50/60 A, 30 HP	3RT10 34	3RT10 34	3RT20 26	2/8
⑦ Solid-state time-delay auxiliary switch block, mountable on the front	3RT19 26-2G...	2/70	⑧ Time-delay relay, laterally mountable	3RP15 74-1N.30			Sec. 11
⑮ Auxiliary switch block, laterally mountable	3RH19 21-1EA..	2/68	⑨ Auxiliary switch block with one unassigned NO contact	3RH19 21-1CA10			2/67
⑯ Surge suppressor	3RT19 26-1.... 3RT19 36-1....	2/73 2/73	⑩ Auxiliary switch block for local control 2 units 3 units	3RH19 21-1CA01 3RH19 21-1CA10			2/67 2/67
⑰ 3-phase feeder terminal	3RV19 35-5A	2/83	⑪ Baseplate	3RA19 32-2E			2/83
⑱ 3-phase busbar	3RV19 35-1A	1/8	⑫ Installation kit	3RA19 33-2C			2/83
⑲ Push-in lug ²⁾ for time-delay relay for screw mounting	3RP19 03	Sec. 11	The installation kit contains the WYE jumper on the top and the wiring jumper on the bottom for connecting the main conducting paths.				

For overview, see page 2/110.
For circuit diagrams, see page 2/200.

1) Not included in scope of supply of complete contactor assemblies; available as accessory.

2) Possible in principle.
If a solid-state time-delay auxiliary switch block is mounted onto the front of K3, an ordinary auxiliary switch block can only be mounted onto the side.

Contactor and Contactor Assemblies

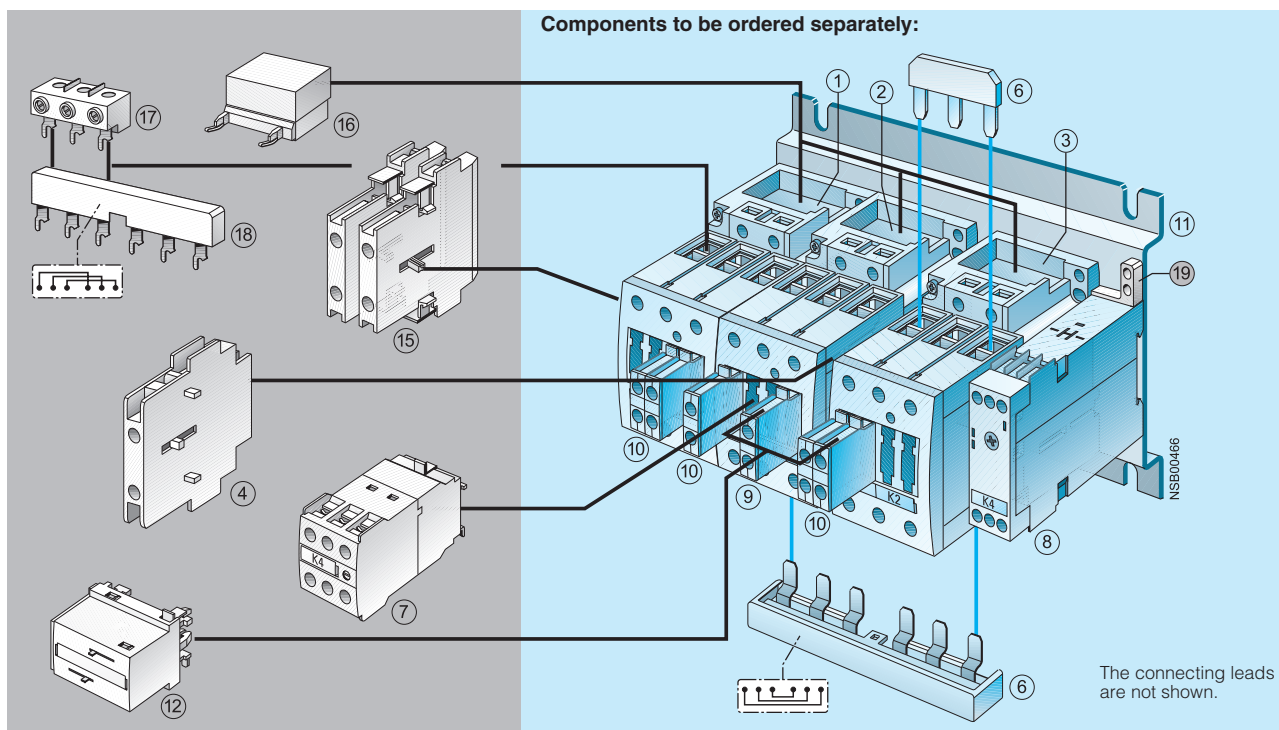
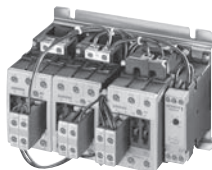
Contactor Assemblies for Switching Motors

Contactor assemblies
for WYE-delta starting



Selection and ordering data

Size S2-S2-S2 · up to 86 A, 60 HP



Accessory	Order No.	Page
④ Mechanical interlock, lateral	3RA19 24-2B	2/80
⑦ Solid-state time-delay auxiliary switch block, mountable on the front	3RT19 26-2G...	2/70
⑫ Mechanical interlock, mountable on the front	3RA19 24-1A	2/68
⑮ Auxiliary switch block, lateral	3RH19 21-1EA..	2/68
⑯ Surge suppressor	3RT19 26-1.... 3RT19 36-1....	2/73 2/73
⑰ 3-phase feeder terminal	3RV19 35-5A	2/83
⑱ 3-phase busbar	3RV19 35-1A	1/8
⑲ Push-in lug ²⁾ for time-delay relay for screw mounting	3RP19 03	Sec. 11

Components	Order No. K1	K3	K2	Page
①②③ Contactors, 80 A, 50 HP	3RT10 35	3RT10 35	3RT10 34	2/8
①②③ Contactors, 86 A, 60 HP	3RT10 36	3RT10 36	3RT10 34	2/8
⑧ Time-delay relay, lateral	3RP15 74-1N.30			Sec. 11
⑨ Auxiliary switch block with one unassigned NO contact	3RH19 21-1CA10			2/67
⑩ Auxiliary switch block for local control 2 units 3 units	3RH19 21-1CA01 3RH19 21-1CA10			2/67
⑪ Baseplate	3RA19 32-2F			2/83
⑥ Installation kit	3RA19 33-2B			2/83

The installation kit contains the WYE jumper on top and the wiring jumper on bottom for connecting the main conducting paths.

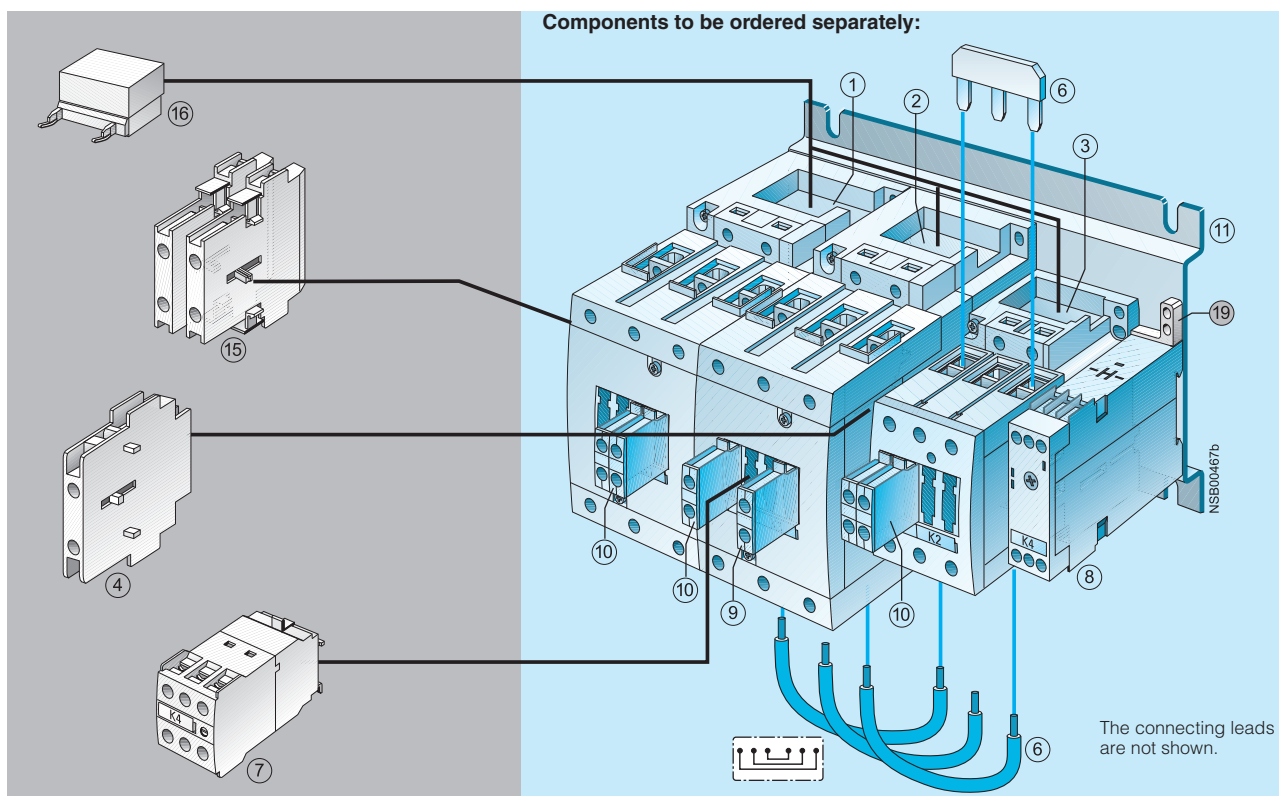
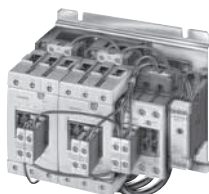
For overview, see page 2/110.
For circuit diagrams, see page 2/200.

1) Not included in scope of supply of complete contactor assemblies; available as accessory.

2) Possible in principle. If a solid-state time-delay auxiliary switch block is mounted onto the front of K3, a standard auxiliary switch block can only be mounted onto the side.

Selection and ordering data

Size S3-S3-S2 · up to 150 A, 100 HP



Accessory	Order No.	Page	Components	Order No.			Page
				K1	K3	K2	
④ Mechanical interlock, lateral, depth must be adapted K3: 0 mm; K2: 27.5 mm	3RA1924-2B	2/80	①②③ Contactors, 115 A, 75 HP	3RT1044	3RT1044	3RT1035	2/8
⑦ Solid-state time-delay auxiliary switch block, mountable on the front	3RT19 26-2G...	2/70	①②③ Contactors, 150 A, 100 HP	3RT1045	3RT1045	3RT1036	2/8
⑮ Auxiliary switch block, lateral	3RH1921-1EA...	2/68	⑧ Time-delay relay, lateral		3RP15 74-1N.30		Sec. 11
⑯ Surge suppressor	3RT19 . 6-1....	2/73	⑨ Auxiliary switch block with one unassigned NO contact		3RH1921-1CA10		2/67
⑲ Push-in lug ²⁾ for time-delay relay for screw mounting	3RP1903	Sec. 11	⑩ Auxiliary switch block for local control 2 units 3 units		3RH1921-1CA01 3RH1921-1CA10		2/67
			⑪ Baseplate	3RA1942-2E			2/83
			⑥ Installation kit	3RA1943-2C			2/83

The installation kit contains the WYE jumper on the top and the wiring jumper on the bottom for connecting the main conducting

For overview, see page 2/110.
For circuit diagrams, see page 2/200.

- 1) Not included in scope of supply of the complete contactor assemblies; available as an accessory.
- 2) Possible in principle. If a solid-state time-delay auxiliary switch block is mounted onto the front of K3, a standard auxiliary switch block can only be mounted onto the side.



3RH21 control relays, size S00 with 4 or 8 contacts

AC and DC operation

IEC 60947, EN 60947.

The 3RH2 contactor relays have screw, ring lug terminal or spring-type terminals. Four contacts are available in the basic unit.

The 3RH2 contactor relays are suitable for use in any climate. They are finger-safe according to EN 50274. The devices with ring lug terminal connection comply with degree of protection IP20 when fitted with the related terminal cover.

Contact reliability

High contact stability at low voltages and currents, suitable for solid-state circuits with currents ≥ 1 mA at a voltage of 17 V.

Surge suppression

RC elements, varistors, diodes or diode assemblies (combination of a diode and a Zener diode) can be plugged onto all contactor relays from the front for damping opening surges in the coil. The plug-in direction is determined by a coding device.

Note:

The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).

Auxiliary switch blocks

The 3RH2 contactor relays can be expanded by up to four contacts by the addition of snap-on auxiliary switch blocks.

The auxiliary switch block can easily be snapped onto the front of the contactors. The auxiliary switch block has a centrally positioned release lever for disassembly.

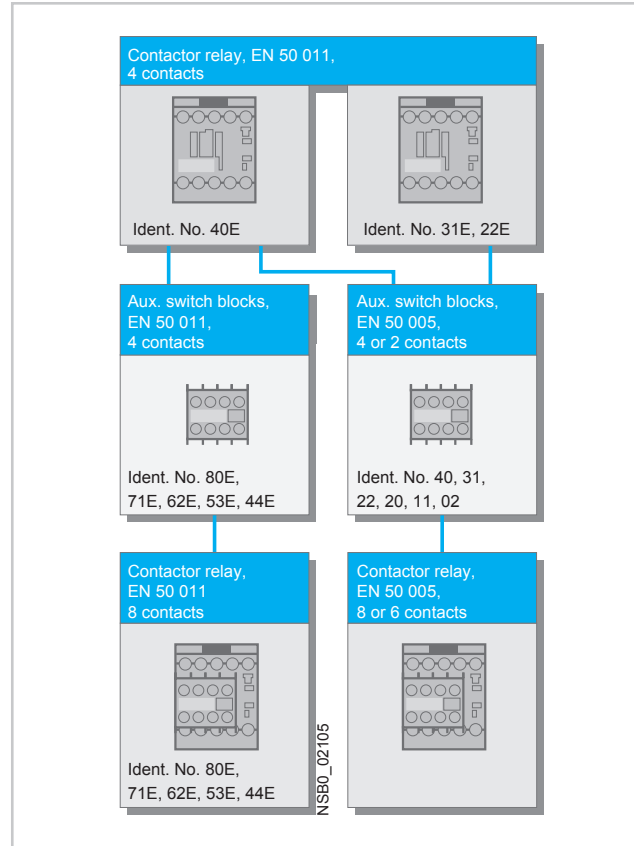
The contactor relays with 4 contacts according to EN 50011, with the identification number 40E, can be extended with 80E to 44E auxiliary switch blocks to obtain contactor relays with 8 contacts according to EN 50011. The identification numbers 80E to 44E on the auxiliary switch blocks apply to the complete contactors. These auxiliary switch blocks (3RH29 11-1GA..) cannot be combined with contactor relays with identification numbers 31E and 22E; they are coded.

All contactor relays with 4 contacts according to EN 50011, identification numbers 40E to 22E, can be extended with auxiliary switch blocks 40 to 02 to obtain contactor relays with 6 or 8 contacts in accordance with EN 50005. The identification numbers on the auxiliary switch blocks apply only to the attached auxiliary switch blocks.

In addition, fully mounted 3RH22 8-pole contactor relays are available; the mounted 4-pole auxiliary switch block in the 2nd tier is not removable. The terminal designations are according to EN 50011.

These versions are built according to special Swiss regulations SUVA and are distinguished externally by a red labeling plate.

Of the auxiliary contacts (integrated plus mountable) possible on the device, no more than four NC contacts are permitted.



3RH24 latched control relays, size S00

Application

AC and DC operation

IEC 60 947, EN 60 947
(VDE 0660)

The terminal designations comply with EN 50 011.

The relay coil and the coil of the release solenoid are both designed for continuous duty.

The number of auxiliary contacts can be extended by means of auxiliary switch blocks (up to 4 poles).

RC elements, varistors, diodes or diode assemblies can be plugged onto both coils

from the front for damping opening surges.

The control relay can also be switched on and released manually.

**Design**

EN 60 947-4-1
(VDE 0660 Part 102).

The 3TF contactors are suitable for use in any climate. They are safe from touch according to DIN VDE 0106 Part 100. Terminal covers (see accessories) may have to be fitted onto the connecting bars, depending on the configuration with other devices.

Main contacts**Contact erosion indication with 3TF68/69 vacuum contactors**

The contact erosion of the vacuum interrupters can be monitored in the closed position by means of three white double slides on the contactor base.

The vacuum interrupter must be replaced if the distance indicated by one of the double slides is less than 0.5 mm while the contactor is in the closed position.

It is advisable to replace all three interrupters in order to ensure maximum reliability.

Auxiliary contacts

The terminal designations comply with EN 50 012.

When the contactors are energized, the NC contacts open before the NO contacts close.

Contact reliability

The auxiliary contacts are extremely reliable and as such are suitable for electronic circuits

- with currents ≥ 1 mA,
- at voltages greater than 17 V.

Surge suppression**Control circuit**

Protection of the coil circuits against surges:

AC operation

- fitted with varistors as standard.

DC operation

Retrofitting options:

- varistors.

Electromagnetic compatibility (EMC)

3TF68/69...C contactors for AC operation are equipped with an electronically controlled solenoid mechanism with a high level of immunity to interference (see table opposite).

Note:

In operation in installations where it is not possible to observe the emitted interference limits, e.g. as an output contactor in static frequency changers, use of 3TF68/69...Q contactors (NS E catalogue, available in German) is recommended, without a main conductor path circuit (for further information refer also to the description below).

Contactor Type	Rated control supply voltage U_s	Overvoltage type (IEC 60 801)	Severity to IEC 60 801	Surge strength
3TF68 44...C... 3TF69 44...C...	110 V ... 132 V	Burst	3	2 kV
		Surge	4	6 kV
	200 V ... 276 V	Burst	4	4 kV
		Surge	4	5 kV
	380 V ... 600 V	Burst	4	4 kV
		Surge	4	6 kV

Circuit of the main conducting paths

An integrated RC varistor circuit in the main conducting paths of the contactors damps the rate of rise of switching overvoltages to uncritical values. Multiple restriking of the switching arcs is thereby prevented.

The operator of an installation can thus assume that the danger to the motor winding arising from switching overvoltages with a high rate of rise is ruled out.

The contactors can therefore be used without reservation for all AC switching applications, including three-phase motors with the demanding AC-4 utilization category.

Important note

The surge suppression circuit is not necessary when 3TF68/69 contactors are used in circuits with e.g. d.c. choppers, frequency converters or variable-speed drives.

It might be damaged by the voltage peaks and harmonics generated. This may also cause phase-to-phase short-circuits in the contactors.

Remedy: Order the special contactor design without surge suppression. In this case the Order No. must be supplemented with "-Z" and the order code "A02". No additional charge is made.

Short-circuit protection of contactors

For assembling fuseless load feeders, please select a circuit-breaker/contactors combination according to the brochure entitled "Verbraucherabzweige in sicherungsloser Bauweise", Order No. E20001-P285-A726 (available in German only).

Contactors and Contactor Assemblies

Accessories for 3RT / 3RH Contactors

SIRIUS



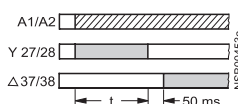
Solid-state, time-delay auxiliary switch box

The timer module, which is available in "ON-delay" and "OFF-delay" designs, allows time-delayed functions up to 100 s (3 distinct delay ranges).

It contains a relay with one NO contact and one NC contact; the relay is switched either after an ON-delay or after an OFF-delay.

The timer module with a WYE-DELTA function is equipped with one delayed and one instantaneous NO contact, with an interval time of 50 ms between the two (see diagram). The delay time of the NO contact can be set between 1.5 s and 30 s.

WYE-delta function



The contactor on which the solid-state, time-delay auxiliary switch block is mounted operates without a delay.

Size S00 (3RT201)

The solid-state, time-delay auxiliary switch block is fitted onto the front of the contactor. The timer module is supplied with power directly by plug-in contacts via the coil terminals of the contactor, in parallel with A1/A2. The time function is activated by closing the contactor on which the auxiliary switch block is mounted. The OFF-delay variant operates without an auxiliary power supply. Minimum ON period: 200 ms.

A varistor is integrated in the timer module for damping opening surges in the contactor coil.

The solid-state, time-delay auxiliary switch block cannot be mounted on size S00 coupling relays.

Sizes S0 to S12 (3RT202 to 3RT107)

The solid-state, time-delay auxiliary switch block is fitted onto the front of the contactor.

The timer module is supplied with power via two terminals (A1/A2); the time delay of the auxiliary switch block can be activated either by a parallel link to any contactor coil or by any power source.

The OFF-delay variant operates without an auxiliary power supply. Minimum ON period: 200 ms.

A single-pole auxiliary switch block can be snapped onto the front of the contactor in addition to the timer module.

The timer module has no integrated components for damping opening surges.

The timer module, which is available in "ON-delay" and "OFF-delay" with auxiliary power supply designs, allows time-delayed functions up to 100 s (3 distinct delay ranges). Contactors fitted with a time-delay block close or open after a delay according to the set time.

The ON-delay variant of the time-delay relay is connected in series with the contactor coil; terminal A1 of this coil must not be connected.

With the OFF-delay variant of the time-delay relay, the contactor coil is contacted directly via the relay; terminals A1 and A2 of the coil must not be connected.

The time-delay relays are suitable for both AC and DC operation.

Size S00 (3RT201)

The variant for size S00 contactors is fitted onto the front of the contactor (with the supply voltage switched off) and then slid into its latched position; at the same time, the time-delay relay is connected by means of plug-in contacts to coil terminals A1 and A2 of the contactor. Any contactor coil terminals which are not required are sealed off by means of covers on the enclosure of the time-delay block, to prevent them from being connected inadvertently (for circuit diagrams, see page 2/149).

A varistor is integrated in the timer module for damping opening surges in the contactor coil.

The solid-state, time-delay block cannot be mounted on size S00 coupling relays.

Sizes S0 to S3 (3RT202 to 3RT107)

The time-delay block for size S0 to S3 contactors is plugged into coil terminals A1 and A2 on top of each contactor; the time-delay relay is connected both electrically and mechanically by means of pins.

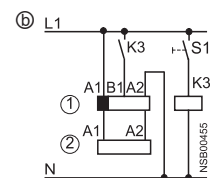
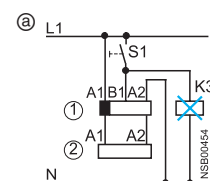
A varistor is integrated in the timer module for damping opening surges in the contactor coil.

Configuration note

Activation of loads parallel to the start input is not permitted with AC operation (see ②).

The 3RT19 16-2D .../3RT19 26-2D ... time-delay blocks with an OFF delay have a voltage-carrying start input B1. This means that if there is a parallel load on terminal B1, activation can be simulated with AC voltage. In this case, the additional load (e.g. contactor K3) must be wired as shown in ⑥.

Solid-state time-delay block with semiconductor output

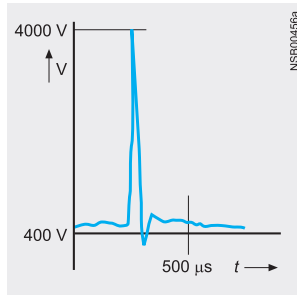


Time-delay block
Contactor

SIRIUS



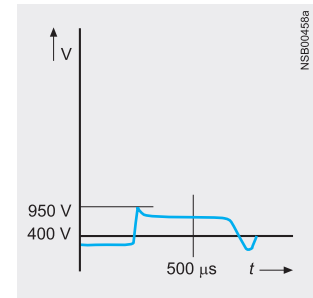
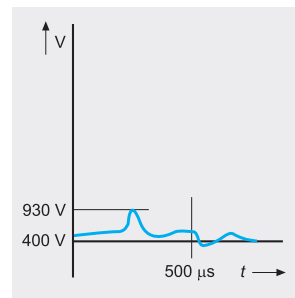
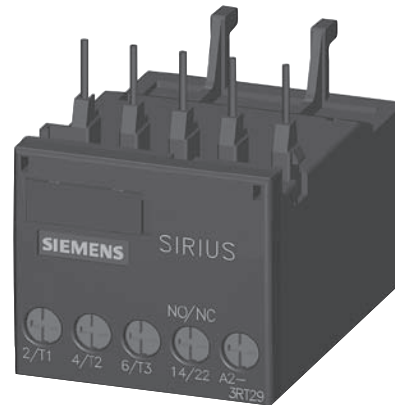
A so-called back-e.m.f. (electromotive force) is produced when motors or various inductive loads are turned off. Voltage peaks of up to 4 000 V may occur as a result, with a frequency spectrum from 1 kHz to 10 MHz and a rate of voltage variation from 0.1 to 20 V/ns.



The connection between the main conducting path and the EMC interference suppression module enables contact arcing, which is responsible for contact erosion and the majority of clicking noises, to be reduced; this in turn is conducive to an electromagnetically compatible design.

Since the EMC interference suppression module achieves a significant reduction in radio-frequency components and the voltage level in three phases, the contact endurance is also improved considerably. This makes an important contribution towards enhancing the reliability and availability of the system as a whole.

There is no need for fine graduations within each performance class, as smaller motors inherently have a higher inductance, so that one solution for all fixed-speed drives up to 7.5 HP is adequate.



Two electrical variants are available:

The advantages of the RC circuit lie mainly in the reduction in the rate of rise and in its RF damping ability. The selected values ensure effective interference suppression over a wide range.

The varistor circuit is able to absorb high energy levels and is also suitable for frequencies from 10 to 400 Hz (variable-speed drives). There is no limiting below the knee-point voltage, however.

OFF-delay device for size S00 to S3 contactors

AC and DC operation

IEC 60 947, EN 60 947

For screwing and snapping onto 35 mm standard mounting rail. The OFF-delay devices have screw connections.

Application

The OFF-delay device prevents a contactor from dropping out unintentionally when there is a short-time voltage dip or voltage failure. It supplies the necessary power for a series-connected, DC-operated contactor during a voltage dip to ensure that the

contactor does not open. The 3RT19 16/3RT29 16 OFF-delay devices are specifically designed for operation with the 3RT contactors and 3RH contactor relays of the SIRIUS series.

Principle of operation

The OFF-delay device operates without external voltage on a capacitive basis, and can be energized with either AC or DC (24 V version for DC operation only). Voltage matching, which is only necessary with AC operation, is performed using a rectifier bridge.

A contactor opens after a delay when the capacitors of the contactor coil, built into the OFF-delay device, are switched in parallel. In the event of voltage failures, the capacitors are discharged via the coil and thereby delay the opening of the contactor.

If the command devices are upstream of the OFF-delay device in the circuit, the OFF delay takes effect with every opening operation. If the opening operation is downstream of the OFF-delay device, an OFF delay only applies in the event of failure of the mains voltage.

Operation

In the case of the versions for rated control supply voltages of 110 V and 230 V, either AC voltage or DC voltage can be applied on the line side, where as the variant for 24 V is designed for DC operation only.

A DC-operated contactor is connected to the output in accordance with the input voltage that is applied.

The mean value of the OFF delay is approximately 1.5 times the specified minimum time.

Contactors and Contactor Assemblies

Accessories for 3RT Contactors

SIRIUS



Interface for mounting on size S0 to S3 contactors

Application

DC operation

IEC 60 947 and EN 60 947
The interface is suitable for use in any climate. It is safe from touch to DIN VDE 0106 Part 100. The terminal designations conform to EN 50 005.

Functions

Design

System-compatible operation with DC 24 V, coil voltage tolerance 17 V to 30 V.
Low power consumption in conformity with the technical data of the electronic systems.
A light-emitting diode indicates the circuit state.

Surge suppression

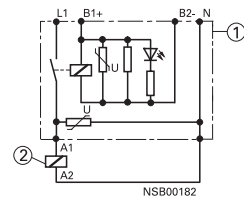
The 3RH29 24-1GP11 interface has an integrated surge suppressor (varistor) for the contactor coil being switched.

Mounting

The 3RH29 24-1GP11 interface is mounted directly on the contactor coil.

Terminal diagram

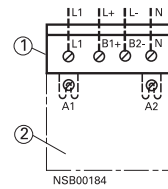
3RH19/29 24-1GP1
with surge suppression



- ① Interface
- ② Contactor

Connection example

3RH19/29 24-1GP1
with surge suppression



- ① Interface
- ② Contactor



More information

Contactors	Type	Size	Width	mm	3RT2 S00 and S0 45
Rated data of the auxiliary contacts					
According to IEC 60947-5-1/EN 60947-5-1					
The data apply to integrated auxiliary contacts and contacts in the auxiliary switch blocks for contactor sizes S00 to S0 ¹⁾					
Rated insulation voltage U_i (pollution degree 3)		V			690
Conventional thermal current I_{th} = Rated operational current I_e/AC-12		A			10
AC load					
Rated operational current I_e/AC-15/AC-14					
• For rated operational voltage U_e					
	24 V	A			10 ¹⁾
	110 V	A			10 ¹⁾
	125 V	A			10 ¹⁾
	220 V	A			10 ¹⁾
	230 V	A			10 ¹⁾
	380 V	A			3
	400 V	A			3
	500 V	A			2
	660 V	A			1
	690 V	A			1
DC load					
Rated operational current I_e/DC-12					
• For rated operational voltage U_e					
	24 V	A			6
	60 V	A			6
	110 V	A			3
	125 V	A			2
	220 V	A			1
	440 V	A			0.3
	600 V	A			0.15
Rated operational current I_e/DC-13					
• For rated operational voltage U_e					
	24 V	A			6
	60 V	A			2
	110 V	A			1
	125 V	A			0.9
	220 V	A			0.3
	440 V	A			0.14
	600 V	A			0.1
Contact reliability at 17 V, 1 mA acc. to EN 60947-5-4					Frequency of contact faults $<10^{-8}$ i. e. <1 fault per 100 million operating cycles

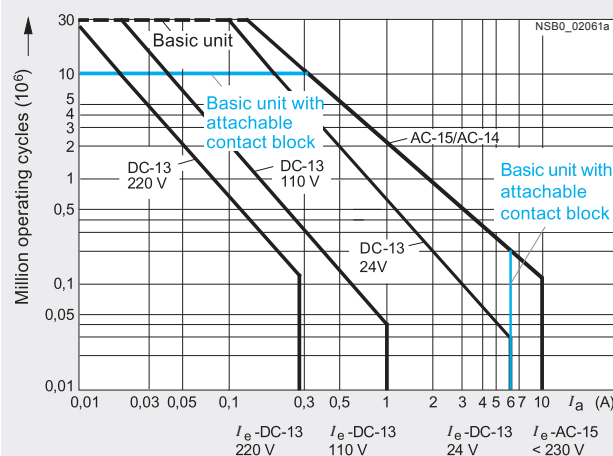
Endurance of the auxiliary contacts

It is assumed that the operating mechanisms are switched randomly, i. e. not synchronized with the phase angle of the supply system.

The contact endurance is mainly dependent on the breaking current.

The characteristic curves apply to:

- Integrated auxiliary contacts on 3RT20
- Auxiliary switch blocks 3RH 29 11, 3RH29 21 for contactors size S00 and S0.



¹⁾ Integrated auxiliary contacts in size S0, auxiliary switches for snapping onto the front and for mounting onto the side in size S00 and S0: $I_e = 6$ A at AC-14/AC-15.

Contactors and Contactor Assemblies

Contactors for Switching Motors



3RT2 contactors

Endurance of the main contacts

The characteristic curves show the contact endurance of the contactors when switching resistive and inductive AC loads (AC-1/AC-3) depending on the breaking current and rated operational voltage. It is assumed that the operating mechanisms are switched randomly, i. e. not synchronized with the phase angle of the supply system.

The rated operational current I_e complies with utilization category AC-4 (breaking six times the rated operational current) and is intended for a contact endurance of at least 200,000 operating cycles.

If a shorter endurance is sufficient, the rated operational current I_e /AC-4 can be increased. I_e

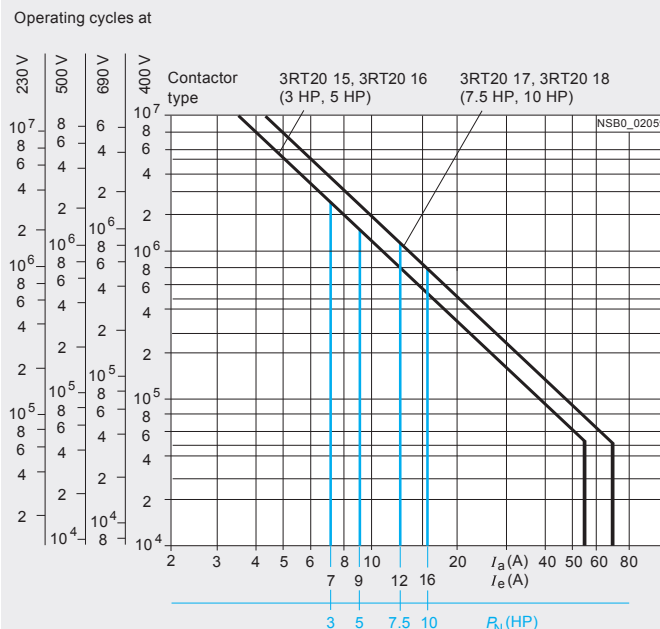
If the contacts are used for mixed operation, i. e. normal switching (breaking the rated operational current according to utilization category AC-3) in combination with intermittent inching (breaking several times the rated operational current according to utilization category AC-4), the contact endurance can be calculated approximately from the following equation:

$$X = \frac{A}{1 + \frac{C}{100} \left(\frac{A}{B} - 1 \right)}$$

Characters in the equation:

- X Contact endurance for mixed operation in operating cycles
- A Contact endurance for normal operation ($I_a = I_e$) in operating cycles
- B Contact endurance for inching ($I_a = \text{multiple of } I_e$) in operating cycles
- C Inching operations as a percentage of total switching operations

Size S00



Size S0

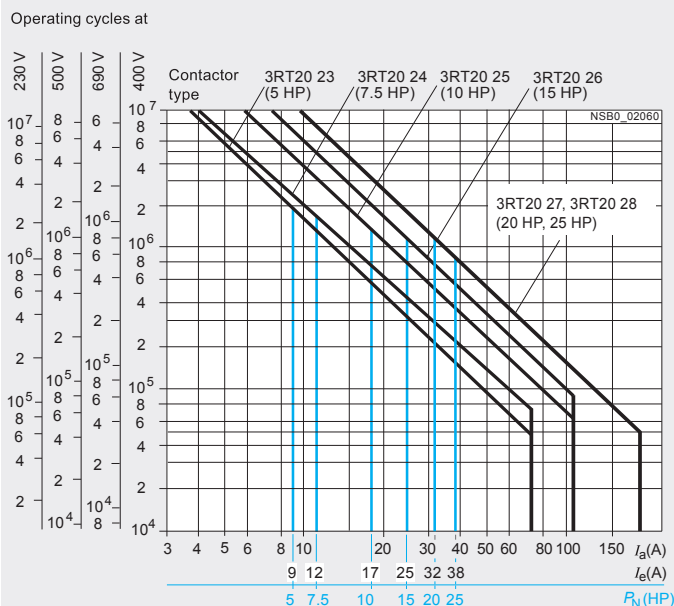


Diagram legend:

P_N = Rated power for squirrel-cage motors at 460 V

I_a = Breaking current

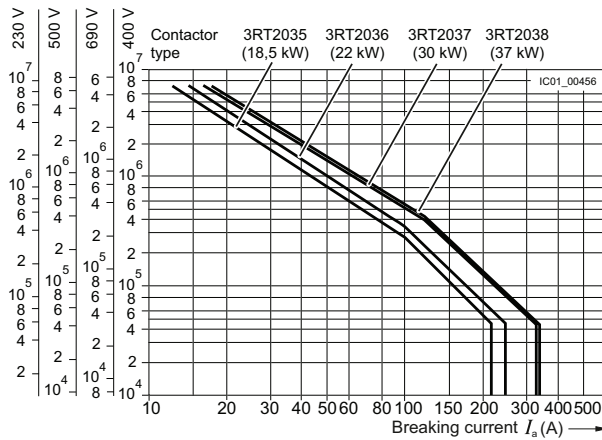
I_e = Rated operational current

Technical data

Endurance of the main contacts

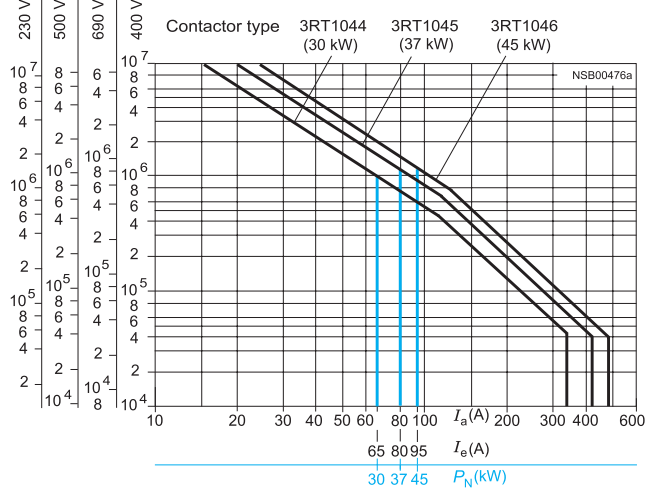
Size S2

Operating cycles at



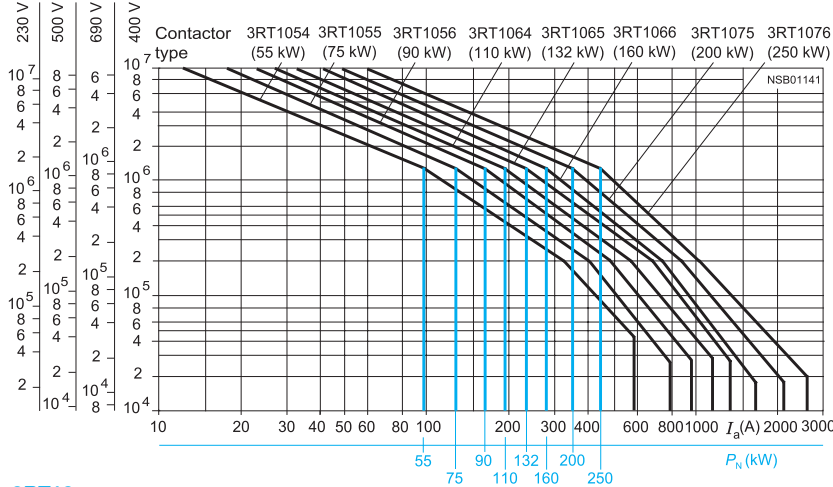
Size S3

Operating cycles at



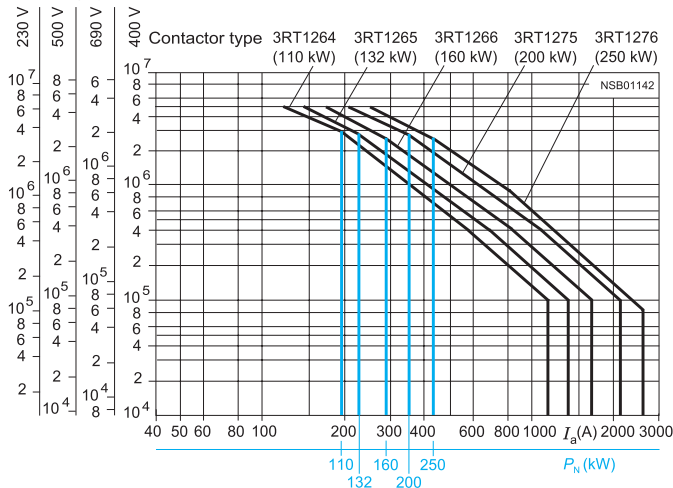
Sizes S6 to S12

Operating cycles at



3RT12 vacuum contactors Sizes S10 and S12

Operating cycles at



Legend:

P_N = Ratings of three-phase motors with squirrel-cage rotor at 400 V
 I_a = Breaking current
 I_e = Rated operational current

Contactors and Contactor Assemblies

Contactors for Switching Motors

3RT2 contactors

• Revised •
09/22/15



Contactors	Type		3RT20 15	3RT20 16	3RT20 17	3RT20 18
	Size		S00	S00	S00	S00
	Width	mm	45	45	45	45
Ⓢ and Ⓛ rated data						
Rated insulation voltage		V AC	600			
Uninterrupted current , at 40 °C		• Open and enclosed	A			
Maximum horsepower ratings (Ⓢ and Ⓛ approved values)						
• Rated power for induction motors at 60 Hz		At 200 V hp	1.5	2	3	3
		230 V hp	2	3	3	5
		460 V hp	3	5	7.5	10
		575 V hp	5	7.5	10	10
Short-circuit protection ¹⁾ (contactor or overload relay)		At 600 V kA	5	5	5	5
		• Fuse CLASS J ²⁾	A	40	40	40
		• Circuit breakers with overload protection according to UL 489	A	50	50	50
• Combination motor controllers type E according to UL 508			...3)	...3)	...3)	...3)
NEMA/EEMAC ratings						
NEMA/EEMAC size						
• Uninterrupted current		- Open	A	--		0
		- Enclosed	A	--		18
• Rated power for induction motors at 60 Hz		At 200 V hp	--			3
		230 V hp	--			3
		460 V hp	--			5
		575 V hp	--			5
Overload relays		• Type	3RU21 1 / 3RB30 1			
		• Setting range	A			

Contactors	Type		3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size		S0	S0	S0	S0	S0	S0
	Width	mm	45	45	45	45	45	45
☞ and ☞ rated data								
Rated insulation voltage		V AC	600				600	
Uninterrupted current, at 40 °C		• Open and enclosed	A				42	
Maximum horsepower ratings (☞ and ☞ approved values)								
• Rated power for induction motors at 60 Hz	At 200 V hp		2	3	5	7.5	10	10
	230 V hp		3	3	5	7.5	10	10
	460 V hp		5	7.5	10	15	20	25
	575 V hp		7.5	10	15	20	25	25
Short-circuit protection ¹⁾ (contactor or overload relay)		At 600 V kA	5	5	5	5	5	5
• Fuse CLASS J ²⁾	A		45	45	45	70	110	110
	• Circuit breakers with overload protection according to UL 489	A	70	70	70	100	100	100
	• Combination motor controllers type E according to UL 508							
	- At 480 V	Type	3RV20 2					
		A	--					
		kA	-- ³⁾					
	- At 600 V	Type	3RV20 2					
		A	--					
		kA	-- ³⁾					
NEMA/EEMAC ratings								
NEMA/EEMAC size							1	
• Uninterrupted current	- Open	A					27	
	- Enclosed	A					27	
• Rated power for induction motors at 60 Hz	At 200 V hp						7.5	
	230 V hp						7.5	
	460 V hp						10	
	575 V hp						10	
Overload relays		• Type	3RU21 2 / 3RB30 2					
	• Setting range	A	1.8 ... 40 / 0.1 ... 40					

¹⁾ For more information about short-circuit values, e. g. for protection against short-circuit currents, see UL reports (<http://support.automation.siemens.com>) for the individual devices.

²⁾ Values for RK5 fuses on request.

³⁾ Values on request.



• Revised •
09/22/15

Contactors and Contactor Assemblies

Contactors for Switching Motors

3RT10 contactors

1

2

☞ and ☞ ratings of the contactors

Contactor	Size Type		S2 3RT20 35	S2 3RT20 36	S2 3RT20 37	S2 3RT20 38	S3 3RT10 44	S3 3RT10 45	S3 3RT10 46
Rated Insulation Voltage			AC V 600				600		
Continuous current , at 40 °C Free air and enclosed			A	55	60	80	90	90	105
Maximum horsepower ratings	Ratings at 115 V	hp	3	3	5	5	5	7.5	10
	single at 230 V	hp	7.5	10	10	15	15	15	-
	phase motors at 50/60 Hz								
☞ and ☞ approved values									
Ratings of three-phase motors at 50/60 Hz	at 200 V	hp	10	15	20	20	20	25	30
	230 V	hp	15	15	20	25	25	30	30
	460 V	hp	30	40	50	50	50	60	75
	575 V	hp	40	50	50	60	60	75	100
Short-circuit protection	Fuse or circuit-breaker	kA	5	10	10	10	5	10	10
	acc. to UL 489	A	150	200	250	250	250	300	350
		A	150	200	200	200	250	300	400
NEMA/EEMAC ratings				2			-		3
Conventional thermal current	Free air	A	-	45	-	-	-	-	90
	Enclosed	A	-	45	-	-	-	-	90
Ratings of three-phase motors at 60 Hz	at 200 V	hp	-	10	-	-	-	-	25
	230 V	hp	-	15	-	-	-	-	30
	460 V	hp	-	25	-	-	-	-	50
	575 V	hp	-	25	-	-	-	-	50
Overload Relay			A	3RU213 / 3RB303 11 ... 80 / 12 ... 80			3RU11 4 18 ... 100		
Contactor Size			S00 - S0 Screw and Spring connection Integrated or snap-on aux. switch block			Screw and Spring connection Laterally mountable aux. switch block		S2 - S12 Screw and Spring connection Single pole and 4-pole Snap-on aux. switch block	
								Screw and Spring connection Laterally mountable aux. switch block	

☞ and ☞ ratings of the auxiliary contactors

Rated Voltage			AC	600	600	600	600
Switching Capacity			At 240 VAC	A	A 600, P 600 10	A 600, Q 600 10	A 600, P 300 10
Uninterrupted current							A 300, Q 300 10

Contactors and Contactor Assemblies

Contactors for Switching Motors

SIRIUS



3RT10 contactors

Technical data

Contactor	Size Type	S6 3RT10 54	S6 3RT10 55	S6 3RT10 56	S10 3RT10 64	S10 3RT10 65	S10 3RT10 66
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Ⓢ and Ⓢ-ratings of the contactors

Rated insulation voltage		AC V	600			600	
Continuous current, at 40 °C	Free air and enclosed	A	140	195	195	250	330
Maximum horsepower ratings	Ratings at 115 V single phase motors at 50/60 Hz	HP	25	30	30		
(Ⓢ and Ⓢ-approved values)							
Ratings of three-phase motors at 50/60 Hz	200 V	HP	40	50	60	60	75
	230 V	HP	50	60	75	75	100
	460 V	HP	100	125	150	150	200
	575 V	HP	125	150	200	200	300
Short-circuit protection	CLASS RK5 fuse	kA	10	10	10	10	18
	Circuit-breaker acc. to UL 489	A	450	500	500	700	800
		A	350	450	500	500	800
NEMA/EEMAC ratings	NEMA/EEMAC SIZE		–	4	–	–	5
Conventional thermal current	Free air	A	–	150	–	–	300
	Enclosed	A	–	135	–	–	270
Ratings of three-phase motors at 60 Hz	at 200 V	HP	–	40	–	–	75
	230 V	HP	–	50	–	–	100
	460 V	HP	–	100	–	–	200
	575 V	HP	–	100	–	–	200
Overload relay	Type		3RB20 56			3RB20 66	

Contactor	Size Type	S12 3RT10 75	S12 3RT10 76
Rated insulation voltage		AC V	600
Continuous current, at 40 °C	Free air and enclosed	A	400
Maximum horsepower ratings			540
(Ⓢ and Ⓢ-approved values)			
Ratings of three-phase motors at 50/60 Hz	at 200 V	HP	125
	230 V	HP	150
	460 V	HP	300
	575 V	HP	400
Short-circuit protection	CLASS RK5 fuse	kA	18
	Circuit-breaker acc. to UL 489	A	1000
		A	900
NEMA/EEMAC ratings	NEMA/EEMAC SIZE		6
Conventional thermal current	Free air	A	–
	Enclosed	A	600
Ratings of three-phase motors at 60 Hz	at 200 V	HP	–
	230 V	HP	150
	460 V	HP	200
	575 V	HP	400
Overload relay	Type		3RB20 66



• Revised •
09/22/15

Contactors and Contactor Assemblies

Contactors for Switching Motors

3RT12 vacuum contactors
3RT contactors for resistive loads

1

2

Technical data

Contactor	Size Type	S10 3RT12 64	S10 3RT12 65	S10 3RT12 66	S12 3RT12 75	S12 3RT12 76
-----------	--------------	-----------------	-----------------	-----------------	-----------------	-----------------

Ⓢ and Ⓜ ratings of the contactors

Rated insulation voltage	AC V	600			600	
Continuous current, at 40 °C	Free air and enclosed	A	330		540	
Maximum horsepower ratings (Ⓢ and Ⓜ-approved values)						
Ratings of three-phase motors at 50/60 Hz	at 200 V	HP	60	75	100	125
	230 V	HP	75	100	125	150
	460 V	HP	150	200	250	300
	575 V	HP	200	250	300	400
Short-circuit protection	CLASS RK5 fuse	kA	10	18	18	30
		A	700	800	800	1200
	Circuit-breaker acc. to UL 489	A	500	700	900	1000
					1200	1200
NEMA/EEMAC ratings						
Conventional thermal current	NEMA/EEMAC SIZE		–	5	–	6
	Free air	A	–		–	
	Enclosed	A	–		–	
			–		–	
Ratings of three-phase motors at 60 Hz	at 200 V	HP	–		–	
	230 V	HP	–		–	
	460 V	HP	–		–	
	575 V	HP	–		–	
Overload relay	Type		3RB20 66		3RB20 66	

Contactor	Size Type	S3 3RT14 46	S6 3RT14 56	S10 3RT14 66	S12 3RT14 76
Rated insulation voltage	AC V	600			
Maximum UL resistive load ratings	A	110	210	360	580

Contactor	Size Type	S00 3RT23 15	S00 3RT23 16	S00 3RT23 17	S0 3RT23 24	S0 3RT23 25	S0 3RT23 26	S0 3RT23 27	S2 3RT23 36	S3 3RT13 44	S3 3RT13 46
Rated insulation voltage	AC V	600									
Maximum UL resistive load ratings	A	16	18	20	30	30	35	42	60	100	110

Contactors and Contactor Assemblies

Contactors for Switching Motors

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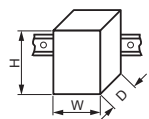
3RT2. 1. contactors

Type

Size

Dimensions (W x H x D)¹⁾

- With mounted auxiliary switch block
- With mounted function block



mm

mm

mm

3RT20 15, 3RT20 16

S00

45 x 57.5 x 73 / 45 x 70 x 73

45 x 57.5 x 116 / 45 x 70 x 121

45 x 57.5 x 142 / 45 x 70 x 142

3RT20 17, 3RT20 18

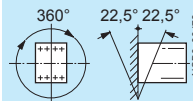
S00

General data

Permissible mounting positions

The contactors are designed for operation on a vertical mounting surface.

AC and DC operation



Upright mounting position

AC and DC operation



Special design required. Positions 13 to 16 of the Order No. must be changed to **-1AA0**. Additional charge.

Mechanical endurance

- Basic unit
- Basic unit with snap-on auxiliary switch block
- Solid-state compatible auxiliary switch block

Operating cycles
Operating cycles
Operat. cycles

30 million

10 million

5 million

Electrical endurance

2)

Rated insulation voltage U_i (pollution degree 3)

V

690

Rated impulse withstand voltage U_{imp}

kV

6

Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N

V

400

Mirror contacts

A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.

- 3RT20 1., 3RT23 1. (removable auxiliary switch block)
- 3RT20 1., 3RT23 1. (permanently mounted auxiliary switch block)
- 3RH29 19-.NF.. solid-state compatible auxiliary switch blocks have no mirror contacts.

Yes, this applies to both the basic unit as well as to between the basic unit and the mounted auxiliary switch block acc. to EN 60947-4-1, Appendix F
Yes, acc. to EN 60947-4-1, Appendix F

Ambient temperature

- During operation
- During storage

°C

°C

-25 ... +60

-55 ... +80

Degree of protection acc. to EN 60947-1, Appendix C

IP20, coil assembly IP40

Touch protection acc. to EN 50274

Finger-safe

Shock resistance rectangular pulse

- AC operation
- DC operation

g/ms

g/ms

6.7/5 and 4.2/10

6.7/5 and 4.2/10

7.3/5 and 4.7/10

7.3/5 and 4.7/10

Shock resistance sine pulse

- AC operation
- DC operation

g/ms

g/ms

10.5/5 and 6.6/10

10.5/5 and 6.6/10

11.4/5 and 7.3/10

11.4/5 and 7.3/10

Conductor cross-sections

3)

Short-circuit protection for contactors without overload relays

For short-circuit protection for contactors with overload relays
see [Section 3: Overload Relays](#)
For short-circuit protection for fuseless load feeders
see [Section 4: Combination Starters](#)

Main circuit

- Fuse links, operational class gG :
NH 3NA, DIAZED 5SB, NEOZED 5SE acc. to IEC 60947-4-1 / EN 60947-4-1
- Type of coordination "1" A
- Type of coordination "2" A
- Weld-free⁴⁾ A
- Miniature circuit breakers (up to 230 V) with C characteristic
Short-circuit current 1 kA, type of coordination "1" A

35

20

10

10

50

25

10

10

Auxiliary circuit

- Fuse links, operational class gG : DIAZED 5SB, NEOZED 5SE (weld-free protection for $I_k \geq 1$ kA) A
- Miniature circuit breakers up to 230 V with C characteristic
Short-circuit current $I_k < 400$ A A

10

6

¹⁾ Dimensions for devices with screw terminals / spring-type terminals.

²⁾ For endurance of the main contacts see page 2/122.

³⁾ For conductor cross-sections see page 2/130.

⁴⁾ Test conditions according to IEC 60947-4-1.



Contactors	Type Size Width	mm	3RT20 15, 3RT20 16 S00 45	3RT20 17, 3RT20 18 S00 45
Control				
Solenoid coil operating range				
• AC operation	50 Hz		0.8 ... 1.1 x U_s	
	60 Hz		0.85 ... 1.1 x U_s	
• DC operation	Up to 50 °C		0.8 ... 1.1 x U_s	
	Up to 60 °C		0.85 ... 1.1 x U_s	
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)				
• AC operation, 50/60 Hz, standard version	- Closing	VA	27/24.3	37/33
	- P.f.		0.8/0.75	0.8/0.75
	- Closed	VA	4.2/3.3	5.7/4.4
	- P.f.		0.25/0.25	0.25/0.25
• AC operation, 50 Hz, USA/Canada	- Closing	VA	26.4	36
	- P.f. for closing		0.81	0.8
	- Closed	VA	4.4	5.9
	- P.f. for closed		0.24	0.24
• AC operation, 60 Hz, USA/Canada	- Closing	VA	31.7	43
	- P.f. for closing		0.81	0.8
	- Closed	VA	4.8	6.5
	- P.f. for closed		0.25	0.25
• DC operation	Closing = Closed	W	4	4
Permissible residual current of the electronics (with 0 signal)				
• AC operation			<3 mA x (230 V/ U_s) ¹⁾	<4 mA x (230 V/ U_s) ¹⁾
• DC operation			<10 mA x (24 V/ U_s) ¹⁾	
Operating times ²⁾				
Total break time = Opening delay + Arcing time				
• AC operation at 0.8 ... 1.1 x U_s	- Closing delay	ms	9 ... 35	8 ... 33
	- Opening delay	ms	3.5 ... 14	4 ... 15
• DC operation at 0.85 ... 1.1 x U_s	- Closing delay	ms	30 ... 100	30 ... 100
	- Opening delay	ms	7 ... 13	7 ... 13
• Arcing time		ms	10 ... 15	10 ... 15
Operating times for 1.0 x U_s ²⁾				
• AC operation	- Closing delay	ms	9.5 ... 24	9 ... 22
	- Opening delay	ms	4 ... 14	4.5 ... 15
• DC operation	- Closing delay	ms	35 ... 50	35 ... 50
	- Opening delay	ms	7 ... 12	7 ... 12

¹⁾ The 3RT29 16-1GA00 additional load module is recommended for higher residual currents.

²⁾ The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).

Contactors	Type Size		3RT20 15 S00	3RT20 16 S00	3RT20 17 S00	3RT20 18 S00	
Main circuit							
AC capacity							
Utilization category AC-1							
Switching resistive loads							
• Rated operational current I_e	At 40 °C up to 690 V	A	18	22	22	22	
	At 60 °C up to 690 V	A	16	20	20	20	
• Rated power for AC loads ¹⁾ P.f. = 0.95 (at 60 °C)	230 V	kW	6.3	7.5	7.5	7.5	
	400 V	kW	11	13	13	13	
	500 V	kW	13.8	17	17	17	
	690 V	kW	19	22	22	22	
• Minimum conductor cross-section for loads with I_e	At 40 °C	mm ²	2.5	2.5	2.5	2.5	
	At 60 °C	mm ²	2.5	2.5	2.5	2.5	
Utilization category AC-3							
• Rated operational currents I_e	Up to 400 V	A	7	9	12	16	
	440 V	A	7	9	11	15	
	500 V	A	6	7.7	9.2	12.4	
	690 V	A	4.9	6.7	6.7	8.8	
• Rated power for slipring or squirrel- cage motors at 50 and 60 Hz	At 200 V	HP	1.5	2	3	3	
	230 V	HP	2	3	3	5	
	460 V	HP	3	5	7.5	10	
	575 V	HP	5	7.5	10	10	
Thermal load capacity		10 s current ²⁾	A	56	72	96	128

¹⁾ Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

²⁾ According to IEC 60947-4-1.
For rated values for various start-up conditions see Section 3 --> "Overload Relays".

Contactors and Contactor Assemblies

Contactors for Switching Motors

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3RT2. 1. contactors

Contactors	Type Size Width	mm	3RT20 15 S00 45	3RT20 16 S00 45	3RT20 17 S00 45	3RT20 18 S00 45
Main circuit						
AC capacity						
Power loss per conducting path	At $I_e/AC-3$	W	0.42	0.7	1.24	2.2
Utilization category AC-4 (for $I_a = 6 \times I_e$) ¹⁾						
• Rated operational current I_e	Up to 400 V	A	6.5	8.5	8.5	11.5
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	Up to 400 V	kW	3	4	4	5.5
• The following applies to a contact endurance of about 200 000 operating cycles:						
- Rated operational currents I_e	Up to 400 V	A	2.6	4.1	4.1	5.5
	690 V	A	1.8	3.3	3.3	4.4
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 230 V	kW	0.67	1.1	1.1	1.5
	400 V	kW	1.15	2	2	2.5
	500 V	kW	1.45	2	2	3
	690 V	kW	1.15	2.5	2.5	3.5

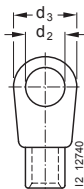
Switching frequency

Switching frequency z in operating cycles/hour

• Contactors without overload relays	No-load switching frequency AC	h ⁻¹	10000
Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \cdot (I_e/I') \cdot (400 V/U')^{1.5} \cdot 1/h$	No-load switching frequency DC	h ⁻¹	10000
	Rated operation AC-1 (AC/DC)	h ⁻¹	1000
	AC-2 (AC/DC)	h ⁻¹	750
	AC-3 (AC/DC)	h ⁻¹	750
	AC-4 (AC/DC)	h ⁻¹	250
• Contactors with overload relays (mean value)		h ⁻¹	15

¹⁾ The data only apply to 3RT25 16 and 3RT25 17 (2 NO + 2 NC) up to a rated operational voltage of 400 V.

Contactors	Type Size	mm	3RT20 15 S00 45	3RT20 16 S00 45	3RT20 17 S00 45	3RT20 18 S00 45
Conductor cross-sections						
Main conductors and auxiliary conductors (1 or 2 conductors can be connected)			Screw terminals			
• Solid	mm ²		2 x (0.5 ... 1.5) ¹⁾ ; 2 x (0.75 ... 2.5) ¹⁾ according to IEC 60947; max. 2 x (0.5 ... 4)			
• Finely stranded with end sleeve	mm ²		2 x (0.5 ... 1.5) ¹⁾ ; 2 x (0.75 ... 2.5) ¹⁾			
• AWG cables, solid or stranded	AWG		2 x (20 ... 16) ¹⁾ ; 2 x (18 ... 14) ¹⁾ ; 2 x 12			
• Terminal screw			M3 (for standard screwdriver size 2 and Pozidriv 2)			
• Tightening torque	Nm		0.8 ... 1.2 (7 ... 10.3 lb.in)			
Main conductors, auxiliary conductors and coil terminals (1 or 2 conductors can be connected)			Spring-type terminals			
• Operating devices	mm		3.0 x 0.5; 3.5 x 0.5			
• Solid	mm ²		2 x (0.5 ... 4)			
• Finely stranded with end sleeve	mm ²		2 x (0.5 ... 2.5)			
• Finely stranded without end sleeve	mm ²		2 x (0.5 ... 2.5)			
• AWG cables, solid or stranded	AWG		1 x (20 ... 12)			
Auxiliary conductors for front and laterally mounted auxiliary switches (1 or 2 conductors can be connected)						
• Operating devices	mm		3.0 x 0.5; 3.5 x 0.5			
• Solid	mm ²		2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve	mm ²		2 x (0.5 ... 1.5)			
• Finely stranded without end sleeve	mm ²		2 x (0.5 ... 1.5)			
• AWG cables, solid or stranded	AWG		2 x (20 ... 14)			
Main conductors and auxiliary conductors			Ring lug terminal connection			
• Terminal screw			M3, Pozidriv 2			
• Operating devices	mm		Ø 5 ... 6			
• Tightening torque	Nm		0.8 ... 1.2			
• Usable ring terminal lugs	mm		$d_2 = \min. 3.2$			
- DIN 46234 without insulation sleeve			$d_3 = \max. 7.5$			
- DIN 46225 without insulation sleeve						
- DIN 46237 with insulation sleeve						
- JIS C2805 Type R without insulation sleeve						
- JIS C2805 Type RAV with insulation sleeve						
- JIS C2805 Type RAP with insulation sleeve						



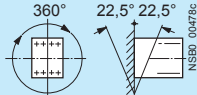

For tool for opening the spring-type terminals
(see Accessories on page 2/79).

Maximum external diameter of the conductor insulation: 3.6 mm.

An "insulation stop" must be used for conductor cross-sections $\leq 1 \text{ mm}^2$
(see Accessories on page 2/79).

¹⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.



Type		3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
Size		S0	S0	S0	S0	S0	S0
Dimensions (W x H x D) for AC operation ¹⁾		45 x 85 x 97 / 45 x 101.5 x 97					
• With mounted auxiliary switch block		45 x 85 x 141 / 45 x 101.5 x 144					
• With mounted function block		45 x 85 x 166 / 45 x 101.5 x 166					
Dimensions (W x H x D) for DC operation ¹⁾		45 x 85 x 107 / 45 x 101.5 x 107					
• With mounted auxiliary switch block		45 x 85 x 151 / 45 x 101.5 x 154					
• With mounted function block		45 x 85 x 176 / 45 x 101.5 x 176					
General data							
Permissible mounting positions							
The contactors are designed for operation on a vertical mounting surface.							
Upright mounting position							
AC and D operation		Special version required, also applies to 3RT20 2.-K.40. coupling relays.					
Mechanical endurance							
• Basic unit	Operating cycles	10 million					
• Basic unit with snap-on auxiliary switch block	Operating cycles	10 million					
• Solid-state compatible auxiliary switch block	Operat. cycles	5 million					
Electrical endurance		2)					
Rated insulation voltage U_i (pollution degree 3)		V	690				
Rated impulse withstand voltage U_{imp}		kV	6				
Protective separation between the coil and the main contacts (acc. to EN 60947-1, Appendix N)		V	400				
Mirror contacts							
A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.							
• 3RT20 2., 3RT23 2. (removable auxiliary switch block)		Yes, acc. to EN 60947-4-1, Appendix F					
• 3RT20 2., 3RT23 2. (permanently mounted auxiliary switch block)		Yes, acc. to EN 60947-4-1, Appendix F					
Permissible ambient temperature							
• During operation	°C	-25 ... +60					
• During storage	°C	-55 ... +80					
Degree of protection acc. to EN 60947-1, Appendix C		IP20, coil assembly IP20					
Touch protection acc.to EN 50274		Finger-safe					
Shock resistance rectangular pulse							
• AC operation	g/ms	7.5/5 and 4.7/10			8.3/5 and 5.310		
• DC operation	g/ms	>10/5 and 7.5/10			>10/5 and 7.5/10		
Shock resistance sine pulse							
• AC operation	g/ms	11.8/5 and 7.4/10			13.5/5 and 8.3/10		
• DC operation	g/ms	>15/5 and >10/10			>15/5 and >10/10		
Conductor cross-sections		3)					
Short-circuit protection for contactors without overload relays							
Main circuit		For short-circuit protection for contactors with overload relays see "Protection Equipment --> Overload Relays". For short-circuit protection for fuseless load feeders see "Motor Starters".					
• Fuse links, operational class gG : Type NH 3NA, DIAZED 5SB, NEOZED 5SE acc. to IEC 60947-4-1/ EN 60947-4-1							
- Type of coordination "1"	A	63			100	125	
- Type of coordination "2"	A	25			35	50	
- Weld-free ⁴⁾	A	10			16	16	
• Miniature circuit breakers with C characteristic (short-circuit current 3 kA, type of coordination "1")	A	25			32	40	
Auxiliary circuit							
• Fuse links, operational class gG : DIAZED 5SB, NEOZED 5SE (weld-free protection for $I_k \geq 1$ kA)	A	10					
• Miniature circuit breaker with C characteristic (short-circuit current $I_k < 400$ A)	A	10					

¹⁾ Dimensions for devices with screw terminals / spring-type terminals.

²⁾ For endurance of the main contacts see page 2/122.

³⁾ For conductor cross-sections page 2/134.

⁴⁾ Test conditions according to IEC 60947-4-1.

Contactors and Contactor Assemblies

Contactors for Switching Motors

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3RT20.2. contactors

Contactors	Type		3RT20 23 ... 3RT20 25	3RT20 26 ... 3RT20 28	3RT20 2. -NB3	3RT20 2. -NF3..	3RT20 2. -NP3
	Size		S0	S0	S0	S0	S0
	Width	mm	45	45	45	45	45
Control							
Solenoid coil operating range		AC/DC	0.8 ... 1.1 x U _s		0.7 ... 1.3 x U _s		
Power consumption of the solenoid coils (when coil is cold and 1.0 x U _s)							
• AC operation, 50 Hz, standard version	- Closing	VA	65	77	6.5	13.6	16.1
	- P.f.		0.82	0.82	0.98	0.98	0.98
	- Closed	VA	7.6	9.8	1.26	1.91	3.41
	- P.f.		0.25	0.25	0.25	0.25	0.25
• AC operation, 50/60 Hz, standard version	- Closing	VA	68/67	81/79	6.5/5.7	13.6/13.2	16.1/15.9
	- P.f.		0.72/0.74	0.72/0.74	0.98/0.96	0.98/0.99	0.99/0.99
	- Closed	VA	7.9/6.5	10.5/8.5	1.26/1.30	1.91/1.90	3.41/3.58
	- P.f.		0.25/0.28	0.25/0.28	0.78/0.8	0.61/0.61	0.36/0.45
• AC operation, 50 Hz, USA/Canada	- Closing	VA	65	77	--	--	--
	- P.f.		0.82	0.82	--	--	--
	- Closed	VA	7.6	9.8	--	--	--
	- P.f.		0.25	0.28	--	--	--
• AC operation, 60 Hz, USA/Canada	- Closing	VA	73	87	--	--	--
	- P.f.		0.76	0.76	--	--	--
	- Closed	VA	7.2	9.4	--	--	--
	- P.f.		0.28	0.28	--	--	--
• DC operation	Closing/closed	W	5.9/5.9	5.9/5.9	6.7/0.8	13.2/1.56	15/1.83
Permissible residual current of the electronics (with 0 signal)							
	• AC operation	mA	< 6 mA x (230 V/U _s)	< 7 mA x (230 V/U _s)			
	• DC operation	mA	< 16 mA x (24 V/U _s)				
Operating times for 0.8 ... 1.1 x U _s ¹⁾							
Total break time = Opening delay + Arcing time							
• AC operation	- Closing delay	ms	9 ... 38	8 ... 40	60 ... 80	50 ... 70	60 ... 80
	- Opening delay	ms	4 ... 16	4 ... 16	30 ... 45	35 ... 45	35 ... 45
• DC operation	- Closing delay	ms	50 ... 170	50 ... 170	60 ... 75	50 ... 70	50 ... 75
	- Opening delay	ms	15 ... 17.5	15 ... 17.5	30 ... 45	35 ... 45	40 ... 50
• Arcing time		ms	10	10	10	10	10
Operating times for 1.0 x U _s ¹⁾							
• AC operation	- Closing delay	ms	10 ... 18	10 ... 17	65 ... 80	50 ... 70	60 ... 80
	- Opening delay	ms	4 ... 16	4 ... 16	30 ... 45	35 ... 45	30 ... 50
• DC operation	- Closing delay	ms	55 ... 80	55 ... 80	60 ... 80	56 ... 70	60 ... 80
	- Opening delay	ms	16 ... 17	16 ... 17	30 ... 45	35 ... 45	30 ... 50

¹⁾ The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2 ms to 5 ms, diode assembly: 2 to 6 times).

Contactor	Type	3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size	S0	S0	S0	S0	S0	S0
	Width	45	45	45	45	45	45

Main circuit

AC capacity

Utilization category AC-1, switching resistive loads

• Rated operational current I_e	At 40 °C up to 690 V	A	40			50	
	At 60 °C up to 690 V	A	35			42	
• Rated power for AC loads ¹⁾	230 V	kW	13.3			15.5	
P.f. = 0.95 (at 60 °C)	400 V	kW	23			27.5	
	500 V	kW	29			35	
	690 V	kW	40			47.5	
• Minimum conductor cross-section for loads with I_e	At 40 °C	mm ²	10			10	
	At 60 °C	mm ²	10			10	

Utilization category AC-3

• Rated operational currents I_e	Up to 400 V	A	9	12	17	25	32	38
	440 V	A	9	12	17	22	32	35
	500 V	A	9	12	17	18	32	32
	690 V	A	9	9	13	13	21	21
• Rated power for slipping or squirrel-cage motors at 50 and 60 Hz	At 230 V	HP	3	3	5	7.5	10	10
	460 V	HP	5	7.5	10	15	20	25
	575 V	HP	7.5	10	15	20	25	25

Thermal load capacity	10 s current ²⁾	A	80	110	150	200	260	300
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Power loss per conducting path	at I_e /AC-3	W	0.4	0.5	0.9	1.6	2.7	3.8
---------------------------------------	----------------	---	-----	-----	-----	-----	-----	-----

Utilization category AC-4 (for $I_a = 6 \times I_e$)

• Rated operational current I_e	Up to 400 V	A	8.5	12.5	15.5	15.5	22	
• Rated power for squirrel-cage motors with 50 and 60 Hz	At 400 V	kW	4	5.5	7.5	7.5	11	
• The following applies to a contact endurance of about 200000 operating cycles:								
- Rated operational currents I_e	Up to 400 V	A	4.1	5.5	7.7	9	12	
	690 V	A	3.3	5.5	7.7	9	12	
- Rated power for squirrel-cage motors with 50 and 60 Hz	At 110 V	kW	0.5	0.73	1	1.2	1.6	
	At 230 V	kW	1.1	1.5	2	2.5	3.4	
	400 V	kW	2	2.6	3.5	4.4	6	
	500 V	kW	2	3.3	4.6	5.6	7.5	
	690 V	kW	2.5	4.6	6	7.7	10.3	

Switching frequency

Switching frequency z in operating cycles/hour

• Contactors without overload relays	No-load switching frequency AC	h ⁻¹	5000					
	No-load switching frequency DC	h ⁻¹	1500					
Dependence of the switching frequency z' on the operational current I' and operational voltage U' : $z' = z \cdot (I_e/I') \cdot (400 V/U')^{1.5} \cdot 1/h$	AC-1 (AC/DC)	h ⁻¹	1000					
	AC-2 (AC/DC)	h ⁻¹	1000			750		
	AC-3 (AC/DC)	h ⁻¹	1000			750		
	AC-4 (AC/DC)	h ⁻¹	300			250		
• Contactors with overload relays (mean value)		h ⁻¹	15					

¹⁾ Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

²⁾ According to IEC 60947-4-1.
For rated values for various start-up conditions see Section 3 --> "Overload Relays"

Contactors and Contactor Assemblies

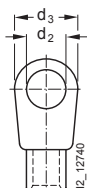
Contactors for Switching Motors

SIRIUS



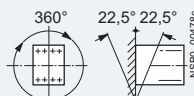

3RT20 2. contactors

Contactors	Type	3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size	S0	S0	S0	S0	S0	S0
	Width mm	45	45	45	45	45	45
Conductor cross-sections (1 or 2 conductors connectable)							
Main conductors		Screw terminals					
Conductor cross-section							
• Solid	mm ²	2 x (1 ... 2.5) ¹⁾ ; 2 x (2.5 ... 10) ¹⁾ according to IEC 60947					
• Finely stranded with end sleeve	mm ²	2 x (1 ... 2.5) ¹⁾ ; 2 x (2.5 ... 6) ¹⁾ ; 1 x 10					
• AWG cables, solid or stranded	AWG	2 x (16 ... 12); 2 x (14 ... 8)					
• Terminal screws		M4 (Pozidriv size 2)					
- Tightening torque	Nm	2 ... 2.5 (18 ... 22 lb.in)					
Auxiliary conductors							
• Solid	mm ²	2 x (0.5 ... 1.5) ¹⁾ ; 2 x (0.75 ... 2.5) ¹⁾ according to IEC 60947					
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5) ¹⁾ ; 2 x (0.75 ... 2.5) ¹⁾					
• Solid or stranded AWG (2 x)	AWG	2 x (20 ... 16) ¹⁾ ; 2 x (18 ... 14) ¹⁾ ; 1 x 12					
• Terminal screws		M3					
- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)					
Main conductors		Spring-type terminals					
• Operating devices	mm	3.0 x 0.5; 3.5 x 0.5					
• Solid	mm ²	2 x (1 ... 10)					
• Finely stranded with end sleeve	mm ²	2 x (1 ... 6)					
• Finely stranded without end sleeve	mm ²	2 x (1 ... 6)					
• AWG cables, solid or stranded	AWG	2 x (18 ... 8)					
Auxiliary conductors							
• Operating devices		3.0 x 0.5; 3.5 x 0.5					
• Solid	mm ²	2 x (0.5 ... 2.5)					
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5)					
• Finely stranded without end sleeve	mm ²	2 x (0.5 ... 1.5)					
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)					
Main conductors		Ring lug terminal connection					
• Terminal screw	mm	M4, Pozidriv size 2					
• Operating devices	mm	Ø 5 ... 6					
• Tightening torque	Nm	2 ... 2.5					
• Usable ring lug terminals - DIN 46234 without insulation sleeve - DIN 46225 without insulation sleeve - DIN 46237 with insulation sleeve - JIS C2805 Type R without insulation sleeve - JIS C2805 Type RAV with insulation sleeve - JIS C2805 Type RAP with insulation sleeve	mm	d ₂ = min. 4.3					
	mm	d ₃ = max. 12.2					
Auxiliary conductors							
• Terminal screw		M3, Pozidriv size 2					
• Operating devices	mm	Ø 5 ... 6					
• Tightening torque	Nm	0.8 ... 1.2					
• Usable ring terminal lugs	mm	d ₂ = min. 3.2					
	mm	d ₃ = max. 7.5					



¹⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

Contactors	Size	S00	S0	S0
		Screw or spring-type terminals	Screw or spring-type terminals	Screw or spring-type terminals
		Integrated or snap-on auxiliary switch block	1- and 4-pole snap-on auxiliary switch block	Laterally mountable auxiliary switch block
Ⓢ and Ⓢ rated data of the auxiliary contacts				
Rated voltage	V AC	600	600	600
Switching capacity		A 600, Q 600	A 600, Q 600	A 300, Q 300
Uninterrupted current	• At 240 V AC	A 10	10	10

Type				3RT2035	3RT2036	3RT2037	3RT2038
Size				S2	S2	S2	S2
Dimensions (W x H x D)				mm	mm	mm	mm
<ul style="list-style-type: none">• With mounted auxiliary switch block¹⁾• With mounted function module¹⁾				55 x 114 x 130	55 x 114 x 174 / 55 x 114 x 178	55 x 114 x 199 / 55 x 114 x 202	
General data							
Permissible mounting position							
The contactors are designed for operation on a vertical mounting surface.							
Upright mounting position				 Special version required			
Mechanical endurance							
• Basic units	Operating cycles	10 million					
• Basic units with snap-on auxiliary switch block	Operating cycles	10 million					
• Solid-state compatible auxiliary switch block	Operating cycles	5 million					
Electrical endurance				2)			
Rated insulation voltage U_i (pollution degree 3)	V	690					
Rated impulse withstand voltage U_{imp}	kV	6					
Protective separation between the coil and the main contacts (acc. to IEC 60947-1, Appendix N)	V	400					
Mirror contacts							
A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with an NO main contact.							
• Integrated auxiliary switches			Yes, acc. to IEC 60947-4-1, Appendix F				
• 3RT202., 3RT232. (removable auxiliary switch block)			Yes, acc. to IEC 60947-4-1, Appendix F				
• 3RT202., 3RT232. (permanently mounted auxiliary switch block)			Yes, acc. to IEC 60947-4-1, Appendix F				
Permissible ambient temperature							
• During operation	°C	-25 ... +60					
• During storage	°C	-55 ... +80					
Degree of protection acc. to IEC 60947-1, Appendix C				IP20			
Connection range				IP00/open (where applicable, use additional terminal covers)			
Touch protection acc. to EN 50274				Finger-safe			
Shock resistance rectangular pulse							
• AC operation	g/ms	11.8/5 and 7.4/10					
• AC/DC operation	g/ms	7.7/5 and 4.5/10					
Shock resistance sine pulse							
• AC operation	g/ms	18.5/5 and 11.6/10					
• AC/DC operation	g/ms	12/5 and 7/10					
Conductor cross-sections				3)			
Short-circuit protection							
Main circuit							
• Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE according to IEC 60947-4-1/EN 60947-4-1				Short-circuit protection for contactors with overload relays See Configuration Manual "Configuring SIRIUS Innovations" 4) Short-circuit protection for fuseless load feeders See Chapter 8, "Load Feeders and Motor Starters for Use in the Control Cabinet" → "SIRIUS 3RA2 Load Feeders"			
- Type of coordination "1"	A	160	160	250	250		
- Type of coordination "2"	A	80	80	125	160		
- Weld-free ⁵⁾	A	On request					
Auxiliary circuit							
• Fuse links, operational class gG: DIAZED, type 5SB; NEOZED, type 5SE (weld-free protection $I_k \leq 1$ kA)	A	10					
• Miniature circuit breakers 230 V, C characteristic (short-circuit current $I_k < 400$ A)	A	10					

¹⁾ Dimensions for devices with screw terminals / spring-type terminals.

²⁾ For contact endurance of the main contacts, see page 3/17.

³⁾ For conductor cross-sections, see page 3/28.

⁴⁾ See <http://support.automation.siemens.com/WW/view/en/39714188>

⁵⁾ Test conditions according to IEC 60947-4-1.

Contactors and Contactor Assemblies

Contactors for Switching Motors

3RT20.3. contactors

• Revised •
10/22/15



Type			3RT2035	3RT2036	3RT2037	3RT2038		
Size			S2	S2	S2	S2		
Control								
Type of operating mechanism			AC			AC/DC		
Solenoid coil operating range								
• AC operation, 50 Hz			0.8 ... 1.1 x U _s	0.8 ... 1.1 x U _s	0.8 ... 1.1 x U _s	0.8 ... 1.1 x U _s		
• AC operation, 60 Hz			--	0.85 ... 1.1 x U _s	0.8 ... 1.1 x U _s	0.8 ... 1.1 x U _s		
• DC operation			--	--	--	0.8 ... 1.1 x U _s		
Power consumption of the solenoid coils (for cold coil and 1.0 x U _s)								
• AC operation, 50 Hz, standard version	- Closing	VA	190	--	--	--		
	- P.f.		0.72	--	--	--		
	- Closed	VA	16	--	--	--		
	- P.f.		0.37	--	--	--		
• AC operation, 50/60 Hz, standard version	- Closing	VA	--	210/188	--	--		
	- P.f.		--	0.69/0.65	--	--		
	- Closed	VA	--	17.2/16.5	--	--		
	- P.f.		--	0.36/0.39	--	--		
• AC operation, 50/60 Hz, for USA/Canada	- Closing	VA	--	--	212/188	--		
	- P.f.		--	--	0.67/0.65	--		
	- Closed	VA	--	--	18.5/16.5	--		
	- P.f.		--	--	0.37/0.39	--		
• AC/DC operation	- Closing for AC operation	VA	--	--	--	40		
	- P.f.		--	--	--	0.64/0.5		
	- Closed for AC operation	VA	--	--	--	2		
	- P.f.		--	--	--	0.36/0.39		
	- Closing for DC operation	W	--	--	--	23		
	- Closed for DC operation	W	--	--	--	1		
Permissible residual current of the electronics (with 0 signal)								
• AC operation	mA		<20					
• DC operation	mA		<20					
Operating times for 0.8 ... 1.1 x U _s ¹⁾								
Total break time = Opening delay + Arcing time								
• AC operation	- Closing delay	ms	10 ... 80			45 ... 70		
	- Opening delay	ms	10 ... 18			35 ... 55		
• DC operation	- Closing delay	ms	--			45 ... 60		
	- Opening delay	ms	--			35 ... 55		
• Arcing time		ms	10 ... 20			10 ... 20		
Operating times for 1.0 x U _s ¹⁾								
• AC operation	- Closing delay	ms	12 ...22			50 ... 60		
	- Opening delay	ms	10 ...18			40 ... 50		
• DC operation	- Closing delay	ms	--			45 ... 55		
	- Opening delay	ms	--			40 ... 50		
Main circuit								
Load rating with AC								
Utilization category AC-1, switching resistive loads								
• Rated operational current I _e	At 40 °C up to 690 V	A	60	70	80	90		
	At 60 °C up to 690 V	A	55	60	70	80		
• Rated power for AC loads ²⁾ P.f. = 0.95 (at 60 °C)	230 V	kW	23	26	30	34		
	400 V	kW	39	46	53	59		
	690 V	kW	68	79	91	102		
• Minimum conductor cross-section for loads with I _e	At 40 °C	mm ²	16	25	25	35		
	At 60 °C	mm ²	16	16	25	25		
Utilization categories AC-2 and AC-3								
• Rated operational currents I _e	Up to 400 V	A	40	50	65	80		
	440 V	A	40	50	65	80		
	500 V	A	40	50	65	80		
	690 V	A	24	24	47	58		
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 230 V	kW	11	15	18.5	22		
	400 V	kW	18.5	22	30	37		
	690 V	kW	22	22	37	45		
Thermal load capacity	10 s current ³⁾	A	400	420	520	640		
Power loss per conducting path			At I _e /AC-3	W	2.2	4	3.8	5.7

¹⁾ The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2 ms to 5 ms, diode assembly: 2 to 6 times).

²⁾ Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

³⁾ According to IEC 60947-4-1.
Rated values for various start-up conditions,
see Chapter 7, "Protection Equipment" → "Overload Relays".

Type	3RT2035	3RT2036	3RT2037	3RT2038
Size	S2	S2	S2	S2
Main circuit				
Load rating with AC				
Utilization category AC-4 (for $I_a = 6 \times I_e$)				
• Maximum values:				
- Rated operational current I_e	Up to 400 V A	35	41	55
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 400 V kW	18.5	22	30
• The following applies to a contact endurance of about 200 000 operating cycles:				
- Rated operational currents I_e	Up to 400 V A	22	24	28
	690 V A	18.5	20	22
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 110 V kW	3.2	3.5	4.1
	230 V kW	6.7	7.3	8.5
	400 V kW	11.6	12.6	14.7
	690 V kW	16.8	18.2	20
				21.8
Load rating with DC				
Utilization category DC-1, switching resistive loads ($L/R \leq 1$ ms)				
• Rated operational currents I_e (at 60 °C)				
- 1 conducting path	Up to 24 V A	55		
	60 V A	23		
	110 V A	4.5		
	220 V A	1		
	440 V A	0.4		
	600 V A	0.25		
- 2 conducting paths in series	Up to 24 V A	55		
	60 V A	45		
	110 V A	25		
	220 V A	5		
	440 V A	1		
	600 V A	0.8		
- 3 conducting paths in series	Up to 24 V A	55		
	60 V A	55		
	110 V A	55		
	220 V A	45		
	440 V A	2.9		
	600 V A	1.4		
Utilization category DC-3/DC-5, shunt-wound and series-wound motors ($L/R \leq 15$ ms)				
• Rated operational currents I_e (at 60 °C)				
- 1 conducting path	Up to 24 V A	35		
	60 V A	6		
	110 V A	2.5		
	220 V A	2		
	440 V A	0.1		
	600 V A	0.06		
- 2 conducting paths in series	Up to 24 V A	55		
	60 V A	45		
	110 V A	25		
	220 V A	5		
	440 V A	0.27		
	600 V A	0.16		
- 3 conducting paths in series	Up to 24 V A	55		
	60 V A	55		
	110 V A	55		
	220 V A	25		
	440 V A	0.6		
	600 V A	0.35		
Switching frequency				
Switching frequency z in operating cycles/hour				
Contactors without overload relays				
• No-load switching frequency				
	AC h^{-1}	5 000		
	AC/DC h^{-1}	1 500		
• Switching frequency z during rated operation ¹⁾				
- $I_e/AC-1$	At 400 V h^{-1}	1 200	1 000	800
- $I_e/AC-2$	At 400 V h^{-1}	750	600	400
- $I_e/AC-3$	At 400 V h^{-1}	1 000	800	700
- $I_e/AC-4$	At 400 V h^{-1}	300	250	200
Contactors with overload relays				
• Mean value				
	h^{-1}	15		

¹⁾ Dependence of the switching frequency z' on the operational current I' and operational voltage U' :

$$z' = z \times (I_e/I') \times (400 V/U')^{1.5} \times 1/h$$



Contactors and Contactor Assemblies

Contactors for Switching Motors

3RT20.3. contactors

• Revised •
09/22/15



Type		3RT2035	3RT2036	3RT2037	3RT2038
Size		S2	S2	S2	S2
Conductor cross-sections (1 or 2 conductors connectable)					
Main conductors		 Screw terminals			
• Solid or stranded	mm ²	2 x (1 ... 35) ¹⁾ ; 1 x (1 ... 50) ¹⁾			
• Finely stranded with end sleeve	mm ²	2 x (1 ... 25) ¹⁾ ; 1 x (1 ... 35) ¹⁾			
• AWG cables, solid or stranded	AWG	2 x (18 ... 2) ¹⁾ ; 1 x (18 ... 1) ¹⁾			
• Terminal screws		Pozidriv size 2; Ø 5 ... 6			
- Tightening torque	Nm	3 ... 4.5 (27 ... 40 lb.in)			
Auxiliary and control conductors					
• Solid or stranded	mm ²	2 x (0.5 ... 1.5) ¹⁾ ; 2 x (0.75 ... 2.5) ¹⁾			
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5) ¹⁾ ; 2 x (0.75 ... 2.5) ¹⁾			
• Solid or stranded AWG (2 x)	AWG	2 x (20 ... 16) ¹⁾ ; 2 x (18 ... 14) ¹⁾			
• Terminal screws		M3 (for Pozidriv size 2, Ø 5 ... 6)			
- Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)			
Auxiliary and control conductors²⁾		 Spring-type terminals			
• Operating devices ³⁾	mm	3.0 x 0.5			
• Solid or stranded	mm ²	2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5)			
• Finely stranded without end sleeve	mm ²	2 x (0.5 ... 2.5)			
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)			

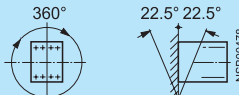

¹⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

²⁾ Max. external diameter of the cable insulation: 3.6 mm.
On spring-type terminals with conductor cross-sections ≤ 1 mm², an insulation stop must be used, [see Accessories, page 3/76](#).

³⁾ Tool for opening the spring-type terminals;
[see "Accessories", page 3/76](#).



Technical data

Contactor		Size Type	S3 3RT10 44	S3 3RT10 45	S3 3RT10 46
General data					
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.		AC and DC operation	<div><div></div><div>For DC operation and forward inclination up to 22.5°: coil voltage tolerance 0.85 ... 1.1 x U_s</div></div>		
Upright mounting position:		AC and DC operation	<div><div></div><div>Special design required. Positions 13 to 16 of the Order No. must be changed to -1AA0. Additional charge.</div></div>		
Mechanical endurance	Basic units Basic unit with snap-on auxiliary switch block Solid-state compatible aux. switch block	Oper. cycles	10 million 10 million 5 million		
Electrical endurance			See page 2/123.		
Rated insulation voltage U _i (pollution degree 3)		V	1000		
Rated impulse withstand voltage U _{imp}		kV	6		
Safe isolation between coil and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])		V	690		
Positively driven operation There is positively driven operation if the NC and NO contacts cannot be closed at the same time		3RT10 4., 3RT13 4., 3RT14 4. (removable aux. switch block) 3RT10 4., 3RT13 4., 3RT14 4. (permanent aux. switch block)	Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC) in accordance with Swiss regulations (SUVA) on request.		
Permissible ambient temperature		in operation °C when stored °C	-25 ... +60 -55 ... +80		
Degree of protection acc. to IEC 60 947-1 and DIN 40 050			IP 20 (terminal compartment IP 00), coil system IP 40		
Shock resistance		Rectangular pulse AC and DC operation Sine pulse AC and DC operation	g/ms g/ms	6.8/5 and 4/10 10.6/5 and 6.2/10	
Conductor cross-sections			See page 2/142.		
Short-circuit protection of contactors without overload relays			For short-circuit protection of contactors with overload relays, see Section 3. For short-circuit protection of fuseless load feeders, see Section 4.		
Main circuit Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – acc. to IEC 60 947-4/ EN 60 947-4-4 (VDE 0660 Part 102)			Type of coord. "1" 1) Type of coord. "2" 1) Weld-free 2)	A A A	250 125 63 250 160 100
Auxiliary circuit Fuse links, utilization category gL/gG DIAZED Type 5SB, NEOZED Type 5SE (weld-free protection at I _k ≥ 1 kA) or miniature circuit-breaker with C-characteristic (short-circuit current I _k < 400 A)			A A	 10 10	

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if

2) Test conditions acc. to IEC 60 947-4-1.

Contactors and Contactor Assemblies

Contactors for Switching Motors

SIRIUS



3RT10.4. contactors

Technical data

Contactor	Size Type		S3 3RT10 44	S3 3RT10 45	S3 3RT10 46
Control circuit					
Coil voltage tolerance		AC/DC	0.8 to $1.1 \times U_s$		
Power consumption of the coils (with coil in cold state and $1.0 \times U_s$)			Standard design		
AC operation		Hz	50	50/60	50
	Closing	VA	218	247 / 211	270
	p.f.		0.61	0.62/ 0.57	0.68
	Closed	VA	21	25 / 18	22
	p.f.		0.26	0.27/ 0.3	0.27
					0.29/ 0.31
			For USA and Canada		
DC operation		Hz	50	60	50
	Closing	VA	218	232	270
	p.f.		0.61	0.55	0.68
	Closed	VA	21	20	22
	p.f.		0.26	0.28	0.27
					0.29
Permissible residual current of the electronics (with 0 signal)					
	AC operation	mA	$< 25 \text{ mA} \times \left(\frac{230 \text{ V}}{U_s} \right)$		
	DC operation	mA	$< 43 \text{ mA} \times \left(\frac{24 \text{ V}}{U_s} \right)$		
Operating times at 0.8 to $1.1 \times U_s$ ¹⁾ Break-time = opening time + arcing time					
AC operation	closing time	ms	16 ... 57	17 ... 90	
	opening time	ms	10 ... 19	10 ... 25	
DC operation	closing time	ms	90 ... 230	90 ... 230	
	opening time	ms	14 ... 20	14 ... 20	
Arcing time		ms	10 ... 15	10 ... 15	
Operating times at $1.0 \times U_s$ ¹⁾					
AC operation	closing time	ms	18 ... 34	18 ... 30	
	opening time	ms	11 ... 18	11 ... 23	
DC operation	closing time	ms	100 ... 120	100 ... 120	
	opening time	ms	16 ... 20	16 ... 20	
Main circuit					
Load ratings with AC					
AC-1 utilization category, switching resistive load					
Rated operational currents I_e	at 40 °C up to 690 V	A	100	120	120
	1000 V	A	50	60	70
	at 60 °C up to 690 V	A	90	100	100
	1000 V	A	40	50	60
Ratings of three-phase loads ²⁾ p.f. = 0.95 (at 60 °C)	at 230 V	kW	34	38	38
	400 V	kW	59	66	66
	500 V	kW	74	82	82
	690 V	kW	102	114	114
	1000 V	kW	66	82	98
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm ²	35	50	50
	60 °C	mm ²	35	35	35
AC-2 and AC-3 utilization categories					
Rated operational currents I_e	up to 400 V	A	65	80	95
	500 V	A	65	80	95
	690 V	A	47	58	58
	1000 V	A	25	30	30
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	18.5	22	22
	400 V	kW	30	37	45
	500 V	kW	37	45	55
	690 V	kW	55	55	55
	1000 V	kW	30	37	37
Thermal loading capacity		10 s current ³⁾	A	600	760
Power loss per conducting path		at I_e /AC-3	W	4.6	7.7
					10.8

1) The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks (varistor +2 ms to 5 ms, diode assem-

2) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

3) Acc. to VDE 0660 Part 102.
For rated values for various starting conditions, see Section 3.



Technical data

Contactor	Size Type	S3 3RT10 44	S3 3RT10 45	S3 3RT10 46
-----------	-----------	----------------	----------------	----------------

Main circuit

Load ratings with AC

AC-4 utilization category (at $I_a = 6 \times I_e$)

Rated operational current I_e	up to 400 V	A	55	66	80
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	30	37	45
• For a contact endurance of approx. 200 000 operating cycles:					
Rated operational currents I_e	up to 400 V	A	28	34	42
	690 V	A	28	34	42
	1000 V	A	20	23	23
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	8.7	10.4	12
	400 V	kW	15.1	17.9	22
	500 V	kW	18.4	22.4	27
	690 V	kW	25.4	30.9	38
	1000 V	kW	22	30	30

AC-5a utilization category, switching gas discharge lamps

per main conducting path at 230 V

Rating per lamp	Rated operational current per lamp (A)				
uncorrected					
L 18 W	0.37	Units	243	270	
L 36 W	0.43	Units	209	232	
L 58 W	0.67	Units	134	149	
lead-lag					
L 18 W	0.11	Units	818	909	
L 36 W	0.21	Units	428	476	
L 58 W	0.32	Units	281	312	

Switching gas discharge lamps with correction, electronic ballast

per main conducting path at 230 V

Rating per lamp	Capacitor (μF)	Rated operational current per lamp (A)				
Parallel correction						
L 18 W	4.5	0.11	Units	160	197	234
L 36 W	4.5	0.21	Units	160	197	234
L 58 W	7	0.32	Units	103	127	150
With electronic ballast, single lamp						
L 18 W	6.8	0.10	Units	455	560	665
L 36 W	6.8	0.18	Units	253	311	369
L 58 W	10	0.27	Units	168	207	246
With electronic ballast, twin lamp						
L 18 W	10	0.18	Units	253	311	369
L 36 W	10	0.35	Units	130	160	190
L 58 W	22	0.52	Units	88	108	128

AC-5b utilization category, switching incandescent lamps

per main conducting path at 230/220 V

	kW	9	14.6	17.3
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AC-6a utilization category, switching three-phase transformers

with inrush

Rated operational current I_e	up to 400 V	A	30	20	30	20	30	20
	690 V	A	42.3	63.5	56.3	80	56.3	84.4
			42.3	47	56.3	58	56.3	58
Ratings of three-phase transformers with an inrush of $n = 30$ or 20.	at 230 V	kVA	16.8	25.3	22.4	31.9	22.4	33.6
The ratings must be re-calculated for other inrush factors x:	400 V	kVA	29.3	43.9	39	55.4	39	58
	500 V	kVA	36.6	54.9	48.7	69.3	48.7	73.1
	690 V	kVA	50.3	56.2	67.3	69.3	67.3	69.3

$$P_x = P_{n30} \cdot \frac{30}{x}$$

AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors

Ambient temperature 40 °C

Rated operational currents I_e	up to 400 V	A	57	72
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 μH) at 50 Hz, 60 Hz and	at 230 V	kvar	24	29
	400 V	kvar	40	50
	525 V	kvar	50	65
	690 V	kvar	40	50

Contactors and Contactor Assemblies

Contactors for Switching Motors

SIRIUS



3RT10.4. contactors

Technical data

Contactor	Size Type	S3 3RT10 44	S3 3RT10 45	S3 3RT10 46
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Main circuit

Load ratings with DC

DC-1 utilization category, switching resistive load (L/R ≤ 1 ms)

Rated operational current I_e (at 60 °C)

Number of conducting paths connected in series

up to 24 V A

60 V A

110 V A

220 V A

440 V A

600 V A

1	2	3	1	2	3	1	2	3
90	90	90	100	100	100	100	100	100
23	90	90	60	100	100	60	100	100
4.5	90	90	9	100	100	9	100	100
1	5	70	2	10	80	2	10	80
0.4	1	2.9	0.6	1.8	1.8	0.6	1.8	4.5
0.26	0.8	1.4	0.4	1	1	0.4	1	2.6

DC-3 and DC-5 utilization categories, shunt and series motors (L/R ≤ 15 ms)

Rated operational current I_e (at 60 °C)

Number of conducting paths connected in series

up to 24 V A

60 V A

110 V A

220 V A

440 V A

600 V A

1	2	3	1	2	3	1	2	3
40	90	90	40	100	100	40	100	100
6	90	90	6.5	100	100	6.5	100	100
2.5	90	90	2.5	100	100	2.5	100	100
1	7	35	1	7	35	1	7	35
0.15	0.42	0.8	0.15	0.42	0.8	0.15	0.42	0.8
0.06	0.16	0.35	0.06	0.16	0.35	0.06	0.16	0.35

Operating frequency

Operating frequency z in operating cycles per hour

Contactors without overload relays

No-load operating frequency

1/h

AC	DC	AC	DC	AC	DC
5000	1000	5000	1000	5000	1000

Dependence of the operating frequency z' on the operational current I' and the operational voltage U' :

$$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400 \text{ V}}{U'} \right)^{1.5} \text{ 1/h}$$

for AC-1 1/h

for AC-2 1/h

for AC-3 1/h

for AC-4 1/h

AC/DC	AC/DC	AC/DC
1000	900	900
400	400	350
1000	1000	850
300	300	250
15	15	15

Contactors with overload relays (mean value)

1/h

Contactor	Size Type	S3 3RT10 4.
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Conductor cross-sections

Screw connections
(1 or 2 conductor connections possible)

Main conductor:

With box terminal

Finely stranded with end sleeve

Finely stranded without end sleeve

Solid

Stranded

Ribbon cable (qty. × width × thickness)

AWG conductor connections, solid and stranded

– Terminal screws

– Tightening torque

Connection for drilled copper bars

max. width

Without box terminal
With cable lugs
(1 or 2 conductor connections possible)

Finely stranded with cable lug

Stranded with cable lug

AWG conductor connections, solid or stranded

Auxiliary conductor:

Solid

Finely stranded with end sleeve

AWG conductor connections, solid or stranded

– Terminal screws

– Tightening torque

Cage Clamp connections
(1 or 2 conductor connections possible)

Auxiliary conductor:

Solid

Finely stranded with end sleeve

Finely stranded without end sleeve

AWG conductor connections, solid or stranded

Front terminal connected	Back terminal connected	Both terminals connected
2.5 ... 35 4 ... 50 mm ² 2.5 ... 16 mm ² 4 ... 70 mm ² 6 × 9 × 0.8 mm 10 ... 2/0 AWG	2.5 ... 50 10 ... 50 mm ² 2.5 ... 16 mm ² 10 ... 70 mm ² 6 × 9 × 0.8 mm 10 ... 2/0 AWG	max. 2 × 35 max. 2 × 35 max. 2 × 16 max. 2 × 50 2 × (6 × 9 × 0.8) 2 × (10 ... 1/0)
M 6 (hexagon socket) 4 ... 6 (36 ... 53 lb.in)		
10		
If bars larger than 12 × 10 mm are connected, a 3RT19 46-4EA1 terminal cover is to comply with the phase clearance.		
If conductors larger than 25 mm ² are connected, a 3RT19 46-4EA1 terminal cover is needed to comply with the phase clearance.		
10 ... 50 ¹⁾ mm ² 10 ... 70 ¹⁾ mm ² 7 ... 1/0 AWG	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4) 2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) 2 × (20 ... 16); 2 × (18 ... 14); 1 × 12 M 3 0.8 ... 1.2 (7 ... 10.3 lb.in)	
2 × (0.25 ... 2.5) mm ² 2 × (0.25 ... 1.5) mm ² 2 × (0.25 ... 2.5) mm ² 2 × (24 ... 14) AWG		

- For tool for opening the Cage Clamp connection, see on accessories [page 2/79](#)
- An "insulation stop" must be used for conductor cross-sections ≤ 1 mm², see accessories on [page 2/79](#).
- Max. outer diameter of conductor insulation: 3.6 mm.
- For information about Cage Clamp connections, see Appendix [page 19/17](#).

1) Only crimping cable lugs acc. to DIN 46 234



Technical data

Contactor	Size Type	S6 3RT10 54	S6 3RT10 55	S6 3RT10 56
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General data

Permissible mounting position

The contactors are designed for operation on a vertical mounting surface.



Mechanical endurance

Oper. cycles 10 million

Electrical endurance

See page 2/123

Rated insulation voltage U_i (pollution degree 3)

V 1000

Rated impulse withstand voltage U_{imp}

kV 8

Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])

V 690

Positively driven operation

There is positively driven operation if the NC and NO contacts cannot be closed at the same time

Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)

Permissible ambient temperature

in operation °C
when stored °C

–25 ... +60/+55 with AS-Interface
–55 ... +80

Degree of protection acc. to IEC 60 947-1 and DIN 40 050

IP 00/open type, coil system IP 20

Shock resistance

Rectangular pulse
Sine pulse

g/ms
g/ms

8.5/5 and 4.2/10
13.4/5 and 6.5/10

Conductor cross-sections

See page 2/145

Electromagnetic compatibility (EMC)

See page 2/106

Short-circuit protection of contactors without overload relays

See Part 4.

Main circuit

Fuse links, utilization category gL/gG
NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE
– acc. to IEC 60 947-4-1/EN 60 947-4-1

Type of coord. "1" 1) A
Type of coord. "2" 1) A
Weld-free 2) A

355
315
80

355
315
160

Auxiliary circuit

Fuse links, utilization category gL/gG
(weld-free protection at $I_k \geq 1$ kA)
DIAZED Type 5SB, NEOZED Type 5SE
or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)

A

10

Contactor	Size Type	S6 3RT10 5.
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Control circuit

Coil voltage tolerance

AC/DC (UC)

$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$

Power consumption of solenoid mechanism

(with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$)

AC operation

Closing

VA

p.f.

Closed

VA

p.f.

Closed

W

W

Conventional op. mechanism

$U_{s \min}$ $U_{s \max}$

250

0.9

4.8

0.8

300

0.9

5.8

0.8

Solid-state op. mechanism

$U_{s \min}$ $U_{s \max}$

190

0.8

3.5

0.5

280

0.8

4.4

0.4

PLC control input (EN 61 131-2/Type 2)

DC 24 V/≤ 30 mA

Operating times

(Break-time = opening time + arcing time)

– at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$

closing time

ms

opening time

ms

– at $U_{s \min} \dots U_{s \max}$

closing time

ms

opening time

ms

Arcing time

ms

Conventional op. mechanism

20 ... 95
40 ... 60

25 ... 50

40 ... 60

10 ... 15

Solid-state op. mechanism

Operation via A1/A2

95 ... 135

80 ... 90

100 ... 120

80 ... 90

10 ... 15

35 ... 75

80 ... 90

40 ... 60

80 ... 90

10 ... 15

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

Contactors and Contactor Assemblies

Contactors for Switching Motors



3RT10.5. contactors

Technical data

Contactor	Size Type	S6 3RT10 54	S6 3RT10 55	S6 3RT10 56
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Main circuit

Load ratings with AC

AC-1 utilization category, switching resistive load								
Rated operational currents I_e	at 40 °C up to 690 V	A	160	185	215			
	at 60 °C up to 690 V	A	140	160	185			
	at 60 °C up to 1000 V	A	80	90	100			
Ratings of three-phase loads ¹⁾ p.f. = 0.95 (at 60 °C)	at 230 V	kW	53	60	70			
	400 V	kW	92	105	121			
	500 V	kW	115	131	152			
	690 V	kW	159	181	210			
	1000 V	kW	131	148	165			
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm ²	70	95	95			
	60 °C	mm ²	50	70	95			
AC-2 and AC-3 utilization categories								
Rated operational currents I_e	up to 500 V	A	115	150	185			
	690 V	A	115	150	170			
	1000 V	A	53	65	65			
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	37	50	61			
	400 V	kW	64	84	104			
	500 V	kW	81	105	132			
	690 V	kW	113	146	167			
	1000 V	kW	75	90	90			
Thermal loading capacity	10 s current ²⁾	A	1100	1300	1480			
Power loss per conducting path	at $I_e/AC-3/500$ V	W	7	9	13			
AC-4 utilization category (at $I_a = 6 \times I_e$)								
Rated operational current I_e	up to 400 V	A	97	132	160			
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	55	75	90			
• For a contact endurance of approx. 200 000 operating cycles:								
Rated operational currents I_e	up to 500 V	A	54	68	81			
	690 V	A	48	57	65			
	1000 V	A	34	38	42			
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	16	20	25			
	400 V	kW	29	38	45			
	500 V	kW	37	47	57			
	690 V	kW	48	55	65			
	1000 V	kW	49	55	60			
AC-6a utilization category, switching three-phase transformers								
with inrush		n	30	20	30	20		
Rated operational current I_e	up to 690 V	A	90	115	99	148	99	148
Ratings of three-phase transformers with an inrush of n = 30 or 20.	at 230 V	kVA	35	45	39	58	39	58
	400 V	kVA	62	79	68	102	68	102
The ratings must be re-calculated for other inrush factors x:	500 V	kVA	77	99	85	128	85	128
	690 V	kVA	107	137	118	176	118	176
	1000 V	kVA	80	80	98	98	117	117
$P_x = P_{n30} \cdot \frac{30}{x}$								
AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors								
Ambient temperature 40 °C								
Rated operational currents I_e	up to 500 V	A	105	125	145			
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar	42	50	58			
	400 V	kvar	72	86	100			
	500 V	kvar	90	108	125			
	690 V	kvar	72	86	100			

1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

2) Acc. to VDE 0660 Part 102.
For rated values for various starting conditions, see Section 3.



Technical data

Contactor	Size Type	S6 3RT10 54	S6 3RT10 55	S6 3RT10 56
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Main circuit

Load ratings with DC

DC-1 utilization category,
switching resistive load ($L/R \leq 1 \text{ ms}$)

Rated operational current I_e (at 60 °C)

Number of conducting paths connected in series

up to 24 V A

60 V A

110 V A

220 V A

440 V A

600 V A

1	2	3
160	160	160
160	160	160
18	160	160
3.4	20	160
0.8	3.2	1.4
0.5	1.6	0.75

DC-3 and DC-5 utilization categories,
shunt and series motors ($L/R \leq 15 \text{ ms}$)

Rated operational current I_e (at 60 °C)

Number of conducting paths connected in series

up to 24 V A

60 V A

110 V A

220 V A

440 V A

600 V A

1	2	3
160	160	160
7.5	160	160
2.5	160	160
0.6	2.5	160
0.17	0.65	11.5
0.12	0.37	4

Operating frequency

Operating frequency z in operating cycles per hour

Contactors without overload relays

No-load operating frequency 1/h

2000

2000

Dependence of the operating frequency z' on the
operational current I' and the operational voltage U' :

for AC-1 1/h

for AC-2 1/h

for AC-3 1/h

for AC-4 1/h

800
400
1000
130

800
300
750
130

$$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400 \text{ V}}{U'} \right)^{1.5} \text{ 1/h}$$

Contactors with overload relays (mean value)

1/h

60

60

Contactor	Size Type	S6 3RT10 5.
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Conductor cross-sections

Screw connections

Main conductor:
with 3RT19 55-4G box terminal (75 HP)

finely stranded with end sleeve

Finely stranded without end sleeve

Stranded

AWG conductor connections, solid/stranded

Ribbon cable (qty. x width x thickness)

with 3RT19 56-4G box terminal

Finely stranded with end sleeve

Finely stranded without end sleeve

Stranded

AWG conductor connections, solid/stranded

Ribbon cable (qty. x width x thickness)

– Terminal screws

– Tightening torque

Without box terminal/busbar connection

Finely stranded with cable lug

Stranded with cable lug

AWG conductor connections, solid or stranded

Connecting bar (max. width)

– Terminal screws

– Tightening torque

Auxiliary conductor:

Solid

Finely stranded with end sleeve

AWG conductor connections, solid or stranded

– Terminal screws

– Tightening torque

Front terminal
connected

Back terminal
connected

Both terminals
connected

16 ... 70
16 ... 70
16 ... 70
6 ... 2/0
min. 3 x 9 x 0.8
max. 6 x 15.5 x 0.8



16 ... 70
16 ... 70
16 ... 70
6 ... 2/0
min. 3 x 9 x 0.8
max. 6 x 15.5 x 0.8



max. 1 x 50, 1 x 70
max. 1 x 50, 1 x 70
max. 2 x 70
max. 2 x 1/0
max. 2 x (6 x 15.5 x 0.8)



16 ... 120
16 ... 120
16 ... 120
6 ... 250 kcmil
min. 3 x 9 x 0.8
max. 10 x 15.5 x 0.8
M 10 (hexagon socket, A/F4)
10 ... 12 (90 ... 110 lb.in)

16 ... 120
16 ... 120
16 ... 120
6 ... 250 kcmil
min. 3 x 9 x 0.8
max. 10 x 15.5 x 0.8

max. 1 x 95, 1 x 120
max. 1 x 95, 1 x 120
max. 2 x 120
max. 2 x 3/0
max. 2 x (10 x 15.5 x 0.8)

16 ... 95
25 ... 120

If cable lugs acc. to DIN 46 235 are connected,
as of a conductor cross-section of 95 mm² a
3RT19 56-4EA1 terminal cover is necessary to
comply with the phase clearance.

4 ... 250 kcmil

17

M 8 x 25 (A/F 13)

10 ... 14 (89 ... 124 lb.in)

2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5) acc. to IEC 60 947;

max. 2 x (0.75 ... 4)

2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5)

2 x (18 ... 14)

M 3 (PZ 2)

0.8 ... 1.2 (7 ... 10.3 lb.in)

Contactors and Contactor Assemblies

Contactors for Switching Motors

SIRIUS



3RT10.6. contactors

Technical data

Contactor		Size Type	S10 3RT10 64	S10 3RT10 65	S10 3RT10 66
General data					
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.					
Mechanical endurance		Oper. cycles	10 million		
Electrical endurance			See page 2/123		
Rated insulation voltage U_i (pollution degree 3)		V	1000		
Rated impulse withstand voltage U_{imp}		kV	8		
Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])		V	690		
Positively driven operation There is positively driven operation if the NC and NO contacts cannot be closed at the same time			Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)		
Permissible ambient temperature		in operation when stored	°C °C	–25 ... +60/+55 with AS-Interface –55 ... +80	
Degree of protection acc. to IEC 60 947-1 and DIN 40 050			IP 00/open type, coil system IP 20		
Shock resistance		Rectangular pulse Sine pulse	g/ms g/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10	
Conductor cross-sections			See page 2/148		
Electromagnetic compatibility (EMC)			See page 2/106		
Short-circuit protection					
Main circuit Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – acc. to IEC 60 947-4-1/EN 60 947-4-1		Type of coord. "1" 1) Type of coord. "2" 1) Weld-free 2)	A A A	500 400 250	
Auxiliary circuit Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)			A	10	

Contactor		Size Type	S10 3RT10 6.			
Control circuit						
Coil voltage tolerance		AC/DC (UC)	$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$			
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$)			Conventional op. mechanism		Solid-state op. mechanism	
			$U_{s \min}$	$U_{s \max}$	$U_{s \min}$	$U_{s \max}$
AC operation	closing	VA	490	590	400	530
	p.f.		0.9	0.9	0.8	0.8
	closed	VA	5.6	6.7	4	5
	p.f.		0.9	0.9	0.5	0.4
DC operation	closing	W	540	650	440	580
	closed	W	6.1	7.4	3.2	3.8
PLC control input (EN 61 131-2/Type 2)			DC 24 V $I \leq 30$ mA			
Operating times (Break-time = opening time + arcing time)			Conventional op. mechanism		Solid-state op. mechanism	
					Operation via A1/A2	
– at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	closing time	ms	30 ... 95		105 ... 145	45 ... 80
	opening time	ms	40 ... 80		80 ... 100	80 ... 100
– at $U_{s \min} \dots U_{s \max}$	closing time	ms	35 ... 50		110 ... 130	50 ... 65
	opening time	ms	50 ... 80		80 ... 100	80 ... 100
Arcing time		ms	10 ... 15		10 ... 15	10 ... 15

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.



Technical data

Contactor	Size Type	S10 3RT10 64	S10 3RT10 65	S10 3RT10 66
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Main circuit

Load ratings with AC

AC-1 utilization category, switching resistive load

Rated operational currents I_e	at 40 °C up to 690 V	A	275	330
	at 60 °C up to 690 V	A	250	300
	at 60 °C up to 1000 V	A	100	150
Ratings of three-phase loads 1) p.f. = 0.95 (at 60 °C)	at 230 V	kW	94	113
	400 V	kW	164	197
	500 V	kW	205	246
	690 V	kW	283	340
	1000 V	kW	164	246
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm ²	150	185
	60 °C	mm ²	120	185

AC-2 and AC-3 utilization categories

Rated operational currents I_e	up to 500 V	A	225	265	300
	690 V	A	225	265	280
	1000 V	A	68	95	95
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	73	85	97
	400 V	kW	128	151	171
	500 V	kW	160	189	215
	690 V	kW	223	265	280
	1000 V	kW	90	132	132

Thermal loading capacity

10 s current 2)	A	1800	2400	2400
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Power loss per conducting path

at $I_e/AC-3/500$ V	W	17	18	22
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AC-4 utilization category (at $I_a = 6 \times I_e$)

Rated operational current I_e	up to 400 V	A	195	230	280
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	110	132	160
• For a contact endurance of approx. 200 000 operating cycles:					
Rated operational currents I_e	up to 500 V	A	96	117	125
	690 V	A	85	105	115
	1000 V	A	42	57	57
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	30	37	40
	400 V	kW	54	66	71
	500 V	kW	67	82	87
	690 V	kW	82	102	112
	1000 V	kW	59	80	80

AC-6a utilization category, switching three-phase transformers

with inrush	n	30	20	30	20	30	20	
Rated operational current I_e	up to 690 V	A	151	227	182	265	182	273
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x:	at 230 V	kVA	60	90	72	105	72	109
	400 V	kVA	105	157	126	183	126	189
	500 V	kVA	130	196	158	229	158	236
	690 V	kVA	180	271	217	317	217	326
	1000 V	kVA	117	117	164	164	164	164
$P_x = P_{n30} \cdot \frac{30}{x}$								

AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors

Ambient temperature 40 °C								
Rated operational currents I_e	up to 500 V	A	183		220			
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar	73		88			
	400 V	kvar	127		152			
	500 V	kvar	159		191			
	690 V	kvar	127		152			

1) Industrial furnaces and electric heaters
with resistance heating, for example (higher
current input allowed for during heating up).

2) Acc. to VDE 0660 Part 102.
For rated values for various
starting conditions, see Section 3.

Contactors and Contactor Assemblies

Contactors for Switching Motors



3RT10.6. contactors

Technical data

Contactor	Size Type	S10 3RT10 64	S10 3RT10 65	S10 3RT10 66
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Main circuit

Load ratings with DC

DC-1 utilization category, switching resistive load ($L/R \leq 1$ ms)

Rated operational current I_e (at 60 °C)

Number of conducting paths connected in series

up to 24 V A

60 V A

110 V A

220 V A

440 V A

600 V A

1	2	3	1	2	3
200	200	200	300	300	300
200	200	200	300	300	300
18	200	200	33	300	300
3.4	20	200	3.8	300	300
0.8	3.2	11.5	0.9	4	11
0.5	1.6	4	0.6	2	5.2

DC-3 and DC-5 utilization categories, shunt and series motors ($L/R \leq 15$ ms)

Rated operational current I_e (at 60 °C)

Number of conducting paths connected in series

up to 24 V A

60 V A

110 V A

220 V A

440 V A

600 V A

1	2	3	1	2	3
200	200	200	300	300	300
7.5	200	200	11	300	300
2.5	200	200	3	300	300
0.6	2.5	200	0.6	2.5	300
0.17	0.65	1.4	0.18	0.65	1.4
0.12	0.37	0.75	0.125	0.37	0.75

Operating frequency

Operating frequency z in operating cycles per hour

Contactors without overload relays

No-load operating frequency 1/h

2000 2000 2000

Dependence of the operating frequency z' on the operational current I' and the operational voltage U' :

$$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400V}{U'} \right)^{1.5} 1/h$$

for AC-1 1/h
for AC-2 1/h
for AC-3 1/h
for AC-4 1/h

750 800 750
250 300 250
500 700 500
130 130 130

Contactors with overload relays (mean value)

1/h 60 60 60

Contactor	Size Type	S10 3RT10 6.
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Conductor cross-sections

Screw connections

Main conductor:
with 3RT19 66-4G box terminal

Finely stranded with end sleeve

mm²

Finely stranded without end sleeve

mm²

Stranded

mm²

AWG conductor connections, solid or stranded

AWG

Ribbon cable (qty. x width x thickness)

mm

– Terminal screws

mm

– Tightening torque

Nm

Without box terminal/busbar connection

Finely stranded with cable lug

mm²

Stranded with cable lug

mm²

AWG conductor connections, solid or stranded

AWG

Connecting bar (max. width)

mm

– Terminal screws

mm

– Tightening torque

Nm

Auxiliary conductor:

Solid

mm²

Finely stranded with end sleeve

mm²

AWG conductor connections, solid or stranded

AWG

– Terminal screws

mm

– Tightening torque

Nm

Front terminal connected	Back terminal connected	Both terminals connected
70 ... 240 	120 ... 185 	min. 2 x 50, max. 2 x 185 min. 2 x 50, max. 2 x 185 min. 2 x 70, max. 2 x 240 min. 2 x 2/0, max. 2 x 500 kcmil
70 ... 240	120 ... 185	
95 ... 300	120 ... 240	
3/0 ... 600 kcmil	250 ... 500 kcmil	
min. 6 x 9 x 0.8 max. 20 x 24 x 0.5 M 12 (hexagon socket, A/F 5)	min. 6 x 9 x 0.8 max. 20 x 24 x 0.5	max. 2 x (20 x 24 x 0.5)
20 ... 22 (180 ... 195 lb.in)		
50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm ² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm ² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.	
70 ... 240		
2/0 ... 500 kcmil		
25		
M 10 x 30 (A/F 17)		
14 ... 24 (124 ... 210 lb.in)		
2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5) acc. to IEC 60 947; max. 2 x (0.75 ... 4)		
2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5)		
2 x (18 ... 14)		
M 3 (PZ 2)		
0.8 ... 1.2 (7 ... 10.3 lb.in)		



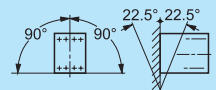
Technical data

Contactor	Size Type	S12 3RT10 75	S12 3RT10 76
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General data

Permissible mounting position

The contactors are designed for operation on a vertical mounting surface.



Mechanical endurance

Oper. cycles 10 million

Electrical endurance

See page 2/123

Rated insulation voltage U_i (pollution degree 3)

V 1000

Rated impulse withstand voltage U_{imp}

kV 8

Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])

V 690

Positively driven operation

There is positively driven operation if the NC and NO contacts cannot be closed at the same time

Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)

Permissible ambient temperature

in operation °C -25 ... +60/+55 with AS-Interface
when stored °C -55 ... +80

Degree of protection acc. to IEC 60 947-1 and DIN 40 050

IP 00/open type, coil system IP 20

Shock resistance

Rectangular pulse
Sine pulse

g/ms 8.5/5 and 4.2/10
g/ms 13.4/5 and 6.5/10

Conductor cross-sections

See page 2/151

Electromagnetic compatibility (EMC)

See page 2/106

Short-circuit protection

Main circuit

Fuse links, utilization category gL/gG
NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE
– to IEC 60 947-4/EN 60 947-4-4 (VDE 0660 Part 102)

Type of coord. "1" 1) A
Type of coord. "2" 1) A
Weld-free 2) A

630
500
250

630
500
315

Auxiliary circuit

Fuse links, utilization category gL/gG
(weld-free protection at $I_k \geq 1$ kA)
DIAZED Type 5SB, NEOZED Type 5SE
or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)

A

10

Control circuit

Coil voltage tolerance

AC/DC (UC)

$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$

Power consumption of solenoid mechanism

(with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$)

AC operation	closing p.f.	VA	Conventional op. mechanism		Solid-state op. mechanism	
			$U_{s \min}$	$U_{s \max}$	$U_{s \min}$	$U_{s \max}$
DC operation	closing	VA	700	830	560	750
	p.f.		0.9	0.9	0.8	0.8
	closed	VA	7.6	9.2	5.4	7
DC operation	closing	W	770	920	600	800
	closed	W	8.5	10	4	5

PLC control input (EN 61 131-2/Type 2)

DC 24 V/≤ 30 mA

Operating times

(Break-time = opening time + arcing time)

– at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	closing time	ms	Conventional op. mechanism		Solid-state op. mechanism	
			Operation via A1/A2		PLC input	
– at $U_{s \min} \dots U_{s \max}$	opening time	ms	45 ... 100	120 ... 150	60 ... 90	
	closing time	ms	60 ... 100	80 ... 100	80 ... 100	
Arcing time	opening time	ms	50 ... 70	125 ... 150	65 ... 80	
	closing time	ms	70 ... 100	80 ... 100	80 ... 100	
		ms	10 ... 15	10 ... 15	10 ... 15	

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

Contactors and Contactor Assemblies

Contactors for Switching Motors



3RT10.7. contactors

Technical data

Contactor	Size Type		S12 3RT10 75	S12 3RT10 76		
Main circuit						
Load ratings with AC						
AC-1 utilization category, switching resistive load						
Rated operational currents I_e	at 40 °C up to 690 V	A	430	610		
	at 60 °C up to 690 V	A	400	550 ³⁾		
	at 60 °C up to 1000 V	A	200	200		
Ratings of three-phase loads ¹⁾ p.f. = 0.95 (at 60 °C)	at 230 V	kW	151	208		
	400 V	kW	263	362		
	500 V	kW	329	452		
	690 V	kW	454	624		
	1000 V	kW	329	329		
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm ²	2 × 150	2 × 185		
	60 °C	mm ²	240	2 × 185		
AC-2 and AC-3 utilization categories						
Rated operational currents I_e	up to 500 V	A	400	500 ⁴⁾		
	690 V	A	400	450		
	1 000 V	A	180	180		
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	132	164		
	400 V	kW	231	291		
	500 V	kW	291	363		
	690 V	kW	400	453		
	1 000 V	kW	250	250		
Thermal loading capacity	10 s current ²⁾	A	3200	4000		
Power loss per conducting path	at $I_e/AC-3/500$ V	W	35	55		
AC-4 utilization category (at $I_a = 6 \times I_e$)						
Rated operational current I_e	up to 400 V	A	350	430		
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	200	250		
• For a contact endurance of approx. 200 000 operating cycles:						
Rated operational currents I_e	up to 500 V	A	150	175		
	690 V	A	135	150		
	1 000 V	A	80	80		
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	48	56		
	400 V	kW	85	98		
	500 V	kW	105	123		
	690 V	kW	133	148		
	1 000 V	kW	113	113		
AC-6a utilization category, switching three-phase transformers						
with inrush		n	30	20	30	20
Rated operational current I_e	up to 690 V	A	251	377	270	404
Ratings of three-phase transformers with an inrush of n = 30 or 20. The ratings must be re-calculated for other inrush factors x:	at 230 V	kVA	100	150	107	161
	400 V	kVA	173	261	187	280
	500 V	kVA	217	326	234	350
	690 V	kVA	300	450	323	483
$P_x = P_{n30} \cdot \frac{30}{x}$	1000 V	kVA	311	311	311	311
AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors						
Ambient temperature 40 °C						
Rated operational currents I_e	up to 500 V	A	287		407	
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar	114		162	
	400 V	kvar	199		282	
	500 V	kvar	248		352	
	690 V	kvar	199		282	

1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

2) Acc. to VDE 0660 Part 102.
For rated values for various starting conditions, see Section 3.

3) Ambient temperature 50 °C for 3RT10 76-.N contactor

4) Ambient temperature 55 °C for 3RT10 76-.N contactor



Technical data

Contactor	Size Type	S12 3RT10 75	S12 3RT10 76
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Main circuit

Load ratings with DC

DC-1 utilization category,
switching resistive load ($L/R \leq 1 \text{ ms}$)

Rated operational current I_e (at 60 °C)

Number of conducting paths connected in series

	1	2	3
up to 24 V A	400	400	400
60 V A	330	400	400
110 V A	33	400	400
220 V A	3.8	400	400
440 V A	0.9	4	11
600 V A	0.6	2	5.2

DC-3 and DC-5 utilization categories,
shunt and series motors ($L/R \leq 15 \text{ ms}$)

Rated operational current I_e (at 60 °C)

Number of conducting paths connected in series

	1	2	3
up to 24 V A	400	400	400
60 V A	11	400	400
110 V A	3	400	400
220 V A	0.6	2.5	400
440 V A	0.18	0.65	1.4
600 V A	0.125	0.37	0.75

Operating frequency

Operating frequency z in operating cycles per hour

Contactors without overload relays

No-load operating
frequency 1/h

2000

2000

Dependence of the operating frequency z' on the
operational current I' and the operational voltage U' :

for AC-1 1/h
for AC-2 1/h
for AC-3 1/h
for AC-4 1/h

700
200
500
130

500
170
420
130

$$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400 \text{ V}}{U'} \right)^{1.5} \text{ 1/h}$$

Contactors with overload relays (mean value)

1/h

60

60

Contactor	Size Type	S12 3RT10 7.
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Conductor cross-sections

Screw connections

Main conductor:

with 3RT19 66-4G box terminal

Finely stranded with end sleeve

mm²

Finely stranded without end sleeve

mm²

Stranded

mm²

AWG conductor connections, solid or
stranded

AWG

Ribbon cable (qty. x width x thickness)

mm

– Terminal screws

mm

– Tightening torque

Nm

Without box terminal/busbar connection

Finely stranded with cable lug

mm²

Stranded with cable lug

mm²

AWG conductor connections, solid or stranded

AWG

Connecting bar (max. width)

mm

– Terminal screws

mm

– Tightening torque

Nm

Auxiliary conductor:

Solid

mm²

Finely stranded with end sleeve

mm²

AWG conductor connections, solid or stranded

AWG

– Terminal screws

mm

– Tightening torque

Nm

Front terminal
connected

Back terminal
connected

Both terminals
connected

70 ... 240
70 ... 240
95 ... 300



120 ... 185
120 ... 185
120 ... 240



min. 2 x 50,
max. 2 x 185
min. 2 x 50,
max. 2 x 185
min. 2 x 70,
max. 2 x 240
min. 2 x 2/0,
max. 2 x 500 kcmil



min. 6 x 9 x 0.8
max. 20 x 24 x 0.5
M 12 (hexagon
socket, A/F 5)

min. 6 x 9 x 0.8
max. 20 x 24 x 0.5

max. 2 x (20 x 24 x 0.5)

20 ... 22 (180 ... 195 lb.in)

50 ... 240
70 ... 240

If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.

2/0 ... 500 kcmil

25
M 10 x 30 (A/F 17)
14 ... 24 (124 ... 210 lb.in)

2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5) acc. to IEC 60 947;
max. 2 x (0.75 ... 4)

2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5)

2 x (18 ... 14)

M 3 (PZ 2)

0.8 ... 1.2 (7 ... 10.3 lb.in)

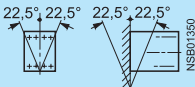
Contactors and Contactor Assemblies

Contactors for Switching Motors



3RT12.6. vacuum contactors

Technical data

Contactor	Size Type	S10 3RT12 64	S10 3RT12 65	S10 3RT12 66		
General data						
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.						
Mechanical endurance		Oper. cycles	10 million			
Electrical endurance		See page 2/123				
Rated insulation voltage U_i (pollution degree 3)		V	1000			
Rated impulse withstand voltage U_{imp}		kV	8			
Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])		V	690			
Positively driven operation There is positively driven operation if the NC and NO contacts cannot be closed at the same time		Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)				
Permissible ambient temperature		in operation when stored	°C °C	-25 ... +60/+55 with AS-Interface -55 ... +80		
Degree of protection acc. to IEC 60 947-1 and DIN 40 050		IP 00/open type, coil system IP 20				
Shock resistance		Rectangular pulse Sine pulse	g/ms g/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10		
Conductor cross-sections		See page 2/154				
Electromagnetic compatibility (EMC)		See page 2/106				
Short-circuit protection						
Main circuit Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – to IEC 60 947-4/EN 60 947-4-4 (VDE 0660Part 102)		Type of coord. "1" 1) Type of coord. "2" 1) Weld-free 2)	A A A	500 500 400		
Auxiliary circuit Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)			A	10		
Control circuit						
Coil voltage tolerance		AC/DC (UC)	$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$			
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$)		Conventional op. mechanism		Solid-state op. mechanism		
AC operation	closing	VA	$U_{s \min}$	$U_{s \max}$	$U_{s \min}$	$U_{s \max}$
	p.f.		530	630	420	570
	closed	VA	0.9	0.9	0.8	0.8
	p.f.		6.1	7.4	4.3	5.6
DC operation	closing	W	580	700	460	630
	closed	W	6.8	8.2	3.4	4.2
PLC control input (EN 61 131-2/Type 2)		DC 24 V/≤ 30 mA				
Operating times (Break-time = opening time + arcing time)		Conventional op. mechanism		Solid-state op. mechanism		
– at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	closing time	ms	30 ... 95	Operation via A1/A2	PLC input	
	opening time		40 ... 80	105 ... 145	45 ... 80	
				80 ... 100	80 ... 100	
– at $U_{s \min} \dots U_{s \max}$	closing time	ms	35 ... 50	110 ... 130	50 ... 65	
	opening time	ms	50 ... 80	80 ... 100	80 ... 100	
Arcing time		ms	10 ... 15	10 ... 15	10 ... 15	

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.



Technical data

Contactor	Size Type	S10 3RT12 64	S10 3RT12 65	S10 3RT12 66
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Main circuit

Load ratings with AC

AC-1 utilization category, switching resistive load

Rated operational currents I_e	at 40 °C up to 1000 V	A	330	
	at 60 °C up to 1000 V	A	300	

Ratings of three-phase loads 1)	at 230 V	kW	113	
p.f. = 0.95 (at 60 °C)	400 V	kW	197	
	500 V	kW	246	
	690 V	kW	340	
	1000 V	kW	492	

Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm ²	185	
	60 °C	mm ²	185	

AC-2 and AC-3 utilization categories

Rated operational currents I_e	up to 1000 V	A	225	265	300
Ratings of slipping or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	73	85	97
	400 V	kW	128	151	171
	500 V	kW	160	189	215
	690 V	kW	223	265	288
	1000 V	kW	320	378	428

Thermal loading capacity

10 s current 2)	A	1800	2120	2400
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Power loss per conducting path

at I_e /AC-3	W	9	12	14
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AC-4 utilization category (at $I_a = 6 \times I_e$)

Rated operational current I_e	up to 690 V	A	195	230	280
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	110	132	160

• For a contact endurance of approx. 400 000 operating cycles:

Rated operational currents I_e	up to 690 V	A	97	115	140
	1000 V	A	68	81	98
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	30	37	45
	400 V	kW	55	65	79
	500 V	kW	68	81	98
	690 V	kW	94	112	138
	1000 V	kW	95	114	140

AC-6a utilization category, switching three-phase transformers

with inrush	n	30	20	
Rated operational current I_e	up to 690 V	A	185	278
Ratings of three-phase transformers with an inrush of $n = 30$ or 20. The ratings must be re-calculated for other inrush factors x:	at 230 V	kVA	74	111
	400 V	kVA	128	193
	500 V	kVA	160	241
	690 V	kVA	221	332
	1000 V	kVA	320	482

$$P_x = P_{n30} \cdot \frac{30}{x}$$

AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors

Ambient temperature 40 °C

Rated operational currents I_e	up to 500 V	A	220	
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar	88	
	400 V	kvar	152	
	500 V	kvar	191	
	690 V	kvar	152	

Operating frequency

Operating frequency z in operating cycles per hour

Contactor without overload relays	No-load operating frequency	1/h	2000	2000
Dependence of the operating frequency z' on the operational current I' and the operational voltage U':	for AC-1	1/h	800	750
	for AC-2	1/h	300	250
	for AC-3	1/h	750	750
	for AC-4	1/h	250	250
$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400 \text{ V}}{U'} \right)^{1.5}$		1/h		
Contactor with overload relays (mean value)		1/h	60	60

1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.

Contactors and Contactor Assemblies




Contactors for Switching Motors

SIRIUS



3RT12.6. vacuum contactors

Technical data

Contactor	Size Type	S10 3RT12 6.			
Conductor cross-sections					
Screw connections	Main conductor: <u>with 3RT19 66-4G box terminal</u>	Front terminal connected	Back terminal connected	Both terminals connected	
Finely stranded with end sleeve	mm ²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185	 NSB00481
Finely stranded without end sleeve	mm ²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185	
Stranded	mm ²	95 ... 300	120 ... 240	min. 2 × 70, max. 2 × 240	
AWG conductor connections, solid or stranded	AWG	3/0 ... 600 kcmil	250 ... 500 kcmil	min. 2 × 2/0, max. 1 × 500 kcmil	
Ribbon cable (qty. × width × thickness)	mm mm	min. 6 × 9 × 0.8 max. 20 × 24 × 0.5	min. 6 × 9 × 0.8 max. 20 × 24 × 0.5	max. 2 × (20 × 24 × 0.5)	
– Terminal screws		M 12 (hexagon socket, A/F 5)			
– Tightening torque	Nm	20 ... 22 (180 ... 195 lb.in)			
<u>Without box terminal/busbar connection</u>					
Finely stranded with cable lug	mm ²	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm ² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm ² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.		
Stranded with cable lug	mm ²	70 ... 240			
AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil			
Connecting bar (max. width)	mm	25			
– Terminal screws		M 10 × 30 (A/F 17)			
– Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)			
Auxiliary conductor:					
Solid	mm ²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)			
Finely stranded with end sleeve	mm ²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)			
AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)			
– Terminal screws		M 3 (PZ 2)			
– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)			



Technical data

Contactor	Size Type		S12 3RT12 75	S12 3RT12 76		
General data						
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.						
Mechanical endurance		Oper. cycles	10 million			
Electrical endurance			See page 2/123			
Rated insulation voltage U_i (pollution degree 3)		V	1000			
Rated impulse withstand voltage U_{imp}		kV	8			
Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])		V	690			
Positively driven operation There is positively driven operation if the NC and NO contacts cannot be closed at the same time		Yes, between main contacts and auxiliary NC contacts and within the auxiliary switch blocks acc. to ZH 1/457, IEC 60 947-4-1, Annex H (draft 17B/996/DC)				
Permissible ambient temperature		in operation when stored	°C °C	–25 ... +60/+55 with AS-Interface –55 ... +80		
Degree of protection acc. to IEC 60 947-1 and DIN 40 050		IP 00/open type, coil system IP 20				
Shock resistance		Rectangular pulse Sine pulse	g/ms g/ms	8.5/5 and 4.2/10 13.4/5 and 6.5/10		
Conductor cross-sections		See page 2/157				
Electromagnetic compatibility (EMC)		See page 2/106				
Short-circuit protection						
Main circuit						
Fuse links, utilization category gL/gG NH Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE – to IEC 60 947-4/EN 60 947-4-4 (VDE 0660Part 102)		Type of coord. "1" 1) Type of coord. "2" 1) Weld-free 2)	A A A	800 800 500		
Auxiliary circuit Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)			A	10		
Control circuit						
Coil voltage tolerance		AC/DC (UC)		$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$		
Power consumption of solenoid mechanism (with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$)		Conventional op. mechanism				
		Solid-state op. mechanism				
		$U_{s \min}$	$U_{s \max}$	$U_{s \min}$	$U_{s \max}$	
AC operation	closing	VA	700	830	560	750
	p.f.		0.9	0.9	0.8	0.8
	closed	VA	7.6	9.2	5.4	7
	p.f.		0.9	0.9	0.8	0.8
DC operation	closing	W	770	920	600	800
	closed	W	8.5	10	4	5
PLC control input (EN 61 131-2/Type 2)		DC 24 V/≤ 30 mA				
Operating times (Break-time = opening time + arcing time)		Conventional op. mechanism			Solid-state op. mechanism	
					Operation via A1/A2	
					PLC input	
– at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$	closing time	ms	45 ... 100		120 ... 150	60 ... 90
	opening time	ms	60 ... 100		80 ... 100	80 ... 100
– at $U_{s \min} \dots U_{s \max}$	closing time	ms	50 ... 70		125 ... 150	65 ... 80
	opening time	ms	70 ... 100		80 ... 100	80 ... 100
Arcing time		ms	10 ... 15		10 ... 15	10 ... 15

1) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.

2) Test conditions acc. to IEC 60 947-4-1.

Contactors and Contactor Assemblies

Contactors for Switching Motors



3RT12.7. vacuum contactors

Technical data

Contactor	Size Type	S12 3RT12 75	S12 3RT12 76
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Main circuit

Load ratings with AC

AC-1 utilization category, switching resistive load

Rated operational currents I_e	at 40 °C up to 1000 V	A	610
	at 60 °C up to 1000 V	A	550
Ratings of three-phase loads ¹⁾ p.f. = 0.95 (at 60 °C)	at 230 V	kW	208
	400 V	kW	362
	500 V	kW	452
	690 V	kW	624
	1000 V	kW	905
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm ²	2 × 185
	60 °C	mm ²	2 × 185

AC-2 and AC-3 utilization categories

Rated operational currents I_e	up to 1000 V	A	400	500
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	132	164
	400 V	kW	231	291
	500 V	kW	291	363
	690 V	kW	400	507
	1000 V	kW	578	728

Thermal loading capacity

10 s current ²⁾

A	3200	4000
---	------	------

Power loss per conducting path

at I_e /AC-3

W	21	32
---	----	----

AC-4 utilization category (at $I_a = 6 \times I_e$)

Rated operational current I_e	up to 690 V	A	350	430
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 400 V	kW	200	250

• For a contact endurance of approx. 400 000 operating cycles:

Rated operational currents I_e	up to 690 V	A	175	215
	1000 V	A	123	151
Ratings of squirrel-cage motors at 50 Hz and 60 Hz	at 230 V	kW	56	70
	400 V	kW	98	122
	500 V	kW	124	153
	690 V	kW	172	212
	1000 V	kW	183	217

AC-6a utilization category, switching three-phase transformers

with inrush	n	30	20	
Rated operational current I_e	up to 690 V	A	279	419
Ratings of three-phase transformers with an inrush of n = 30 or 20.	at 230 V	kVA	111	167
	400 V	kVA	193	290
The ratings must be re-calculated for other inrush factors x:	500 V	kVA	241	363
	690 V	kVA	332	501
	1000 V	kVA	482	726

$$P_x = P_{n30} \cdot \frac{30}{x}$$

AC-6b utilization category, switching low-inductance (low-loss, metallized-dielectric) three-phase capacitors

Ambient temperature 40 °C

Rated operational currents I_e	up to 500 V	A	407
Ratings of single capacitors or of capacitor banks (minimum inductance between parallel capacitors 6 µH) at 50 Hz, 60 Hz and	at 230 V	kvar	162
	400 V	kvar	282
	500 V	kvar	352
	690 V	kvar	282

Operating frequency

Operating frequency z in operating cycles per hour

Contactors without overload relays	No-load operating frequency	1/h	2000
------------------------------------	-----------------------------	-----	------

Dependence of the operating frequency z' on the operational current I' and the operational voltage U':

$$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400 \text{ V}}{U'} \right)^{1.5} \quad 1/\text{h}$$





Contactors with overload relays (mean value)	1/h	60
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1) Industrial furnaces and electric heaters with resistance heating, for example (higher current input allowed for during heating up).

2) Acc. to VDE 0660 Part 102. For rated values for various starting conditions, see Section 3.



Technical data

Contactors	Size Type	S12 3RT12 7.			
Conductor cross-sections					
Screw connections					
Main conductor: with 3RT19 66-4G box terminal		Front terminal connected	Back terminal connected	Both terminals connected	
Finely stranded with end sleeve	mm ²	70 ... 240 	120 ... 185 	min. 2 × 50, max. 2 × 185	
Finely stranded without end sleeve	mm ²	70 ... 240	120 ... 185	min. 2 × 50, max. 2 × 185	
Stranded	mm ²	95 ... 300 	120 ... 240 	min. 2 × 70, max. 2 × 240	
AWG conductor connections, solid or stranded	AWG	3/0 ... 600 kcmil	250 ... 500 kcmil	min. 2 × 2/0, max. 2 × 500 kcmil	
Ribbon cable (qty. × width × thickness)	mm	min. 6 × 9 × 0.8	min. 6 × 9 × 0.8	max. 2 × (20 × 24 × 0.5)	
– Terminal screws	mm	max. 20 × 24 × 0.5	max. 20 × 24 × 0.5		
– Tightening torque	Nm	M 12 (hexagon socket, A/F 5)			
		20 ... 22 (180 ... 195 lb.in)			
Without box terminal/busbar connection					
Finely stranded with cable lug	mm ²	50 ... 240	If cable lugs acc. to DIN 46 234 are connected, as of a conductor cross-section of 240 mm ² and acc. to DIN 46 235 as of a conductor cross-section of 185 mm ² a 3RT19 66-4EA1 terminal cover is necessary to comply with the phase clearance.		
Stranded with cable lug	mm ²	70 ... 240			
AWG conductor connections, solid or stranded	AWG	2/0 ... 500 kcmil			
Connecting bar (max. width)	mm	25			
– Terminal screws		M 10 × 30 (A/F 17)			
– Tightening torque	Nm	14 ... 24 (124 ... 210 lb.in)			
Auxiliary conductor:					
Solid	mm ²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947;			
Finely stranded with end sleeve	mm ²	max. 2 × (0.75 ... 4)			
AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)			
– Terminal screws		M 3 (PZ 2)			
– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)			

Contactors and Contactor Assemblies

Contactors for Switching Motors

**3RT14 contactors, 3-pole,
for switching resistive loads (AC-1)**

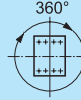
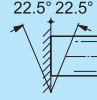

SIRIUS



Technical data

Contactor	Size Type	S3 3RT14 46
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General data

Permissible mounting position The contactors are designed for operation on a vertical mounting surface.	AC and DC operation	  <p>For DC operation and forward inclination up to 22.5°: coil voltage tolerance $0.85 \dots 1.1 \times U_s$</p>
Upright mounting position:		
	AC operation	 <p>Special design required. Positions 13 ... 16 of the Order No. must be changed to -1AA0. Additional charge.</p>
	DC operation	–

Mechanical endurance	Oper. cycles	10 million
Electrical endurance AC-1 utilization category at I_e	Oper. cycles	0.5 million
Rated insulation voltage U_i (pollution degree 3)	V	1000
Rated impulse withstand voltage U_{imp}	kV	6
Safe isolation between coil and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])	V	690
Permissible ambient temperature	in operation when stored	°C °C
		–25 ... +60 –55 ... +80
Degree of protection acc. to IEC 60 947-1 and DIN 40 050		IP 20 (terminal compartment IP 00), coil system IP 40
Shock resistance		
Rectangular pulse	AC and DC operation	g/ms
Sine pulse	AC and DC operation	g/ms
		6.8/5 and 4/10 10.6/5 and 6.2/10
Conductor cross-sections		See page 2/160

Short-circuit protection of contactors without overload relays

Main circuit				
Fuse links, utilization category gL/gG NH, Type 3NA	Type of coord. "1" 2)	A	250	
Fuse links, utilization category gR SITOR, Type 3NE	Type of coord. "2" 2)	A	250	
Auxiliary circuit				
Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA) DIAZED Type 5SB, NEOZED Type 5SE		A	10	
or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)		A	10	

Control circuit

Coil voltage tolerance	AC/DC	$0.8 \dots 1.1 \times U_s$
Power consumption of the coils (with coil in cold state and $1.0 \times U_s$)		Standard design
AC operation	Hz	50
	VA	270
	p.f.	0.68
	closed	22
	p.f.	0.27
DC operation	W	15
	closing = closed	
Operating times at $0.8 \dots 1.1 \times U_s$ 1) Break-time = opening time + arcing time		
AC operation	ms	17 ... 90
	ms	10 ... 25
DC operation	ms	90 ... 230
	ms	14 ... 20
Arcing time	ms	10 ... 15
Operating times at $1.0 \times U_s$ 1)		
AC operation	ms	18 ... 30
	ms	11 ... 23
DC operation	ms	100 ... 120
	ms	16 ... 20

1) The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks: varistor +2 ms to 5 ms, diode assemblies 2 to 6 times.

2) According to excerpt from IEC 60 947-4-1 (VDE 0660 Part 102):
Type of coordination "1":
Destruction of the contactor and the overload relay is permissible. The contactor and/or overload relay must be replaced if necessary.

Type of coordination "2":
No damage can be tolerated to the overload relay, but contact welding on the contactor is permitted if the contacts can be easily separated.



Technical data

Contactors	Size Type	S3 3RT14 46
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Main circuit

Load ratings with AC

AC-1 utilization category, switching resistive load

Rated operational currents I_e	at 40 °C up to 690 V	A	140
	at 60 °C up to 690 V	A	130
	at 1000 V	A	60
Ratings of three-phase loads p.f. = 0.95 (at 60 °C)	at 230 V	kW	50
	400 V	kW	86
	500 V	kW	107
	690 V	kW	148
	1000 V	kW	98
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm ²	50
	at 60 °C	mm ²	50

AC-2 and AC-3 utilization categories

With an electrical endurance of 1.3 million operating cycles

Rated operational current I_e	up to 690 V	A	44
Ratings of slipring or squirrel-cage motors at 50 Hz and 60 Hz (at 60 °C)	at 230 V	kW	12.7
	400 V	kW	22
	500 V	kW	29.9
	690 V	kW	38.2

Power loss per conducting path	at I_e /AC-1	W	12.5
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Load ratings with DC

DC-1 utilization category, switching resistive load $L/R \leq 1 \text{ ms}$

Number of conducting paths when connected in series

			1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V	A	130	130	130
	60 V	A	80	130	130
	110 V	A	12	130	130
	220 V	A	2.5	13	130
	440 V	A	0.8	2.4	6
	600 V	A	0.48	1.3	3.4

DC-3 and DC-5 utilization categories, shunt and series motors

Number of conducting paths when connected in series

			1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V	A	6	130	130
	60 V	A	3	130	130
	110 V	A	1.25	130	130
	220 V	A	0.35	1.75	4
	440 V	A	0.15	0.42	0.8
	600 V	A	0.1	0.27	0.45

Operating frequency

Operating frequency z in operating cycles per hour

			AC operation	DC operation
Contactors without overload relays	No-load operating frequency	1/h	5000	1000
Rated operation	for AC-1	1/h	650	650
	for AC-3	1/h	1000	1000

Dependence of the operating frequency z' on the operational current I' and the operational voltage U' :

$$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400V}{U'} \right)^{1.5} \quad 1/h$$

Contactors and Contactor Assemblies

Contactors for Special Applications

**3RT14 contactors, 3-pole,
for switching resistive loads (AC-1)**

SIRIUS



Technical data

Contactor	Size Type	S3 3RT14 46			
Conductor cross-sections					
Screw connections (1 or 2 conductor connections possible)	Main conductor: <u>With box terminal</u>		Front terminal connected	Back terminal connected	Both terminals connected
	Finely stranded with end sleeve	mm ²	2.5 ... 50	2.5 ... 50	max. 2x35
	Finely stranded without end sleeve	mm ²	4 ... 50	10 ... 50	max. 2x35
	Solid	mm ²	2.5 ... 16	2.5 ... 16	max. 2x16
	Stranded	mm ²	4 ... 70	10 ... 70	max. 2x50
	Ribbon cable (qty. x width x thickness)	mm	6 x 9 x 0.8	6 x 9 x 0.8	2x(6x9x0.8)
	AWG conductor connections	AWG	10 ... 2/0	10 ... 2/0	2x (10 ... 1/0)
Connection for drilled copper bars	– Terminal screws	Nm	M 6 (hexagon socket)		
	– Tightening torque	mm	4 ... 6 (36 ... 53 lb.in)		
			10		
			If bars larger than 12 x 10 mm are connected, a 3RT19 46-4EA1 terminal cover is necessary to comply with the phase clearance		
	<u>Without box terminal with cable lugs</u>				
	Finely stranded with cable lug	mm ²	10 ... 50 ¹⁾	If conductors larger than 25 mm ² are connected, a 3RT19 46-4EA1 terminal cover is necessary to comply with the phase clearance	
	Stranded with cable lug	mm ²	10 ... 70 ¹⁾		
	AWG conductor connections, solid or stranded	AWG	7 ... 1/0		
	Auxiliary conductor:				
	Solid	mm ²	2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5) acc. to IEC 60 947; max. 2 x (0.75 ... 4)		
	Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5)		
	AWG conductor connections, solid or stranded	AWG	2 x (20 ... 16); 2 x (18 ... 14); 1 x 12		
	– Terminal screws	M 3			
	– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		



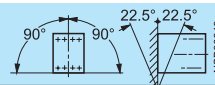
Technical data

Contactors	Size Type	S6 3RT14 56
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General data

Permissible mounting position

The contactors are designed for operation on a vertical mounting surface.



Mechanical endurance

Oper.
cycles

10 million

Electrical endurance

AC-1 utilization category at I_e

Oper.
cycles

0.5 million

Rated insulation voltage U_i (pollution degree 3)

V

1000

Rated impulse withstand voltage U_{imp}

kV

8

Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])

V

690

Permissible ambient temperature

in operation
when stored

°C

–25 ... +60/+55 with AS-Interface
–55 ... +80

Degree of protection acc. to IEC 60 947-1 and DIN 40 050

IP 00/open type, coil system IP 20

Shock resistance

Rectangular pulse

g/ms

8.5/5 and 4.2/10

Sine pulse

g/ms

13.4/5 and 6.5/10

Conductor cross-sections

See page 2/162

Electromagnetic compatibility (EMC)

See page 2/106

Short-circuit protection

Main circuit

Fuse links, utilization category gL/gG,
NH, Type 3NA

Type of coordination "1" A

355

Fuse links, utilization category gR,
SITOR, Type 3NE

Type of coordination "2" A

350

Auxiliary circuit

Fuse links, utilization category gL/gG

A

10

(weld-free protection at $I_k \geq 1$ kA)

DIAZED Type 5SB, NEOZED Type 5SE

or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)

Control circuit

Coil voltage tolerance

AC/DC (UC)

$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$

Power consumption of solenoid mechanism

(with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$)

Conventional op. mechanism

Solid-state op. mechanism

AC operation

closing

VA

$U_{s \min}$ $U_{s \max}$

$U_{s \min}$ $U_{s \max}$

p.f.

250

300

190

280

closed

0.9

0.9

0.8

0.8

p.f.

4.8

5.8

3.5

4.4

closed

0.8

0.8

0.5

0.4

DC operation

closing

W

300

360

250

320

closed

4.3

5.2

2.3

2.8

PLC control input (EN 61 131-2/Type 2)

DC 24 V ≤ 30 mA

Operating times

(Break-time = opening time + arcing time)

Conventional op. mechanism

Solid-state op. mechanism

– at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$

closing time

ms

20 ... 95

95 ... 135

35 ... 75

opening time

ms

40 ... 60

80 ... 90

80 ... 90

– at $U_{s \min} \dots U_{s \max}$

closing time

ms

25 ... 50

100 ... 120

40 ... 60

opening time

ms

40 ... 60

80 ... 90

80 ... 90

Arcing time

ms

10 ... 15

10 ... 15

10 ... 15

Main circuit

Load ratings with AC

AC-1 utilization category, switching resistive load

Rated operational currents I_e

at 40 °C up to 690 V

A

275

at 60 °C up to 690 V

A

250

at 1000 V

A

100

Ratings

at 230 V

kW

95

of three-phase loads

400 V

kW

165

p.f. = 0.95 (at 60 °C)

500 V

kW

205

690 V

kW

285

1000 V

kW

165

Minimum conductor cross-section with $I_{e \text{ load}}$

at 40 °C

mm²

2 × 70

at 60 °C

mm²

120

Power loss per conducting path

at I_e /AC-1

W

20



Technical data

Contactor	Size Type	S6 3RT14 56
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Main circuit

Load ratings with AC

AC-2 and AC-3 utilization category

With an electrical endurance of 1.3 million operating cycles

Rated operational current I_e	up to 690 V	A	97
Ratings of slipping or squirrel-cage motors at 50 Hz and 60 Hz (at 60 °C)	at 230 V	kW	30
	400 V	kW	55
	500 V	kW	55
	690 V	kW	90

Load ratings with DC

DC-1 utilization category, switching resistive load ($L/R \leq 1$ ms)

Number of conducting paths connected in series

		1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V	A	315	315
	60 V	A	315	315
	110 V	A	18	315
	220 V	A	3.4	20
	440 V	A	0.8	3.2
	600 V	A	0.5	1.6

DC-3 and DC-5 utilization categories, shunt and series motors ($L/R \leq 15$ ms)

Number of conducting paths connected in series

		1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V	A	315	315
	60 V	A	7.5	315
	110 V	A	2.5	315
	220 V	A	0.6	2.5
	440 V	A	0.17	0.65
	600 V	A	0.12	0.37

Operating frequency

Operating frequency z in operating cycles per hour

Contactors without overload relays	No-load op. frequency	1/h	2000
	for AC-1	1/h	600
	for AC-3	1/h	1000

Dependence of the operating frequency z' on the operational current I' and operational voltage U' :

$$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400V}{U'} \right)^{1.5} \quad 1/h$$

Conductor cross-sections

Screw connections

Main conductor:

with 3RT19 55-4G box terminal

Finely stranded with end sleeve	mm ²	10 ... 70
Finely stranded without end sleeve	mm ²	10 ... 70
Stranded	mm ²	16 ... 70
AWG conductor connections, solid or stranded		6 ... 2/0
Ribbon cable (qty. × width × thickness)	mm	min. 3 × 9 × 0.8
	mm	max. 6 × 15.5 × 0.8

with 3RT19 56-4G box terminal

Finely stranded with/without end sleeve	mm ²	10 ... 120
Stranded	mm ²	16 ... 120
AWG conductor connections, solid or stranded	AWG	6 ... 250 kcmil
Ribbon cable (qty. × width × thickness)	mm	min. 3 × 9 × 0.8
	mm	max. 10 × 15.5 × 0.8
– Terminal screws		M 10 (hexagon socket, A/F4)
– Tightening torque	Nm	10 ... 12 (90 ... 110 lb.in)

Without box terminal/busbar connection

Finely stranded with cable lug	mm ²	16 ... 95
Stranded with cable lug	mm ²	25 ... 120
AWG conductor connections, solid or stranded	AWG	4 ... 250 kcmil
Connecting bar (max. width)	mm	17
– Terminal screws		M 8 × 25 (A/F 13)
– Tightening torque	Nm	10 ... 14 (89 ... 124 lb.in)

Auxiliary conductor:

Solid	mm ²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4)
Finely stranded with end sleeve	mm ²	2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)
AWG conductor connections, solid or stranded	AWG	2 × (18 ... 14)
– Terminal screws		M 3 (PZ2)
– Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)

Front terminal connected	Back terminal connected	Both terminals connected
10 ... 70 10 ... 70 16 ... 70 6 ... 2/0	10 ... 70 10 ... 70 16 ... 70 6 ... 2/0	max. 1×50, 1×70 max. 1×50, 1×70 max. 2 × 70 max. 2 × 1/0
min. 3 × 9 × 0.8 max. 6 × 15.5 × 0.8	min. 3 × 9 × 0.8 max. 6 × 15.5 × 0.8	max. 2 × (6 × 15.5 × 0.8)
10 ... 120 16 ... 120 6 ... 250 kcmil	10 ... 120 16 ... 120 6 ... 250 kcmil	max. 1 × 95, 1 × 120 max. 2 × 120 max. 2 × 3/0
min. 3 × 9 × 0.8 max. 10 × 15.5 × 0.8 M 10 (hexagon socket, A/F4)	min. 3 × 9 × 0.8 max. 10 × 15.5 × 0.8	max. 2 × (10 × 15.5 × 0.8)
10 ... 12 (90 ... 110 lb.in)		
16 ... 95 25 ... 120 4 ... 250 kcmil	If cable lugs acc. to DIN 46 235 are connected, as of a conductor cross-section of 95 mm ² a 3RT19 56-4EA1 terminal cover is necessary to comply with the phase clearance.	
17 M 8 × 25 (A/F 13) 10 ... 14 (89 ... 124 lb.in)		
2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947; max. 2 × (0.75 ... 4) 2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) 2 × (18 ... 14) M 3 (PZ2)		
0.8 ... 1.2 (7 ... 10.3 lb.in)		



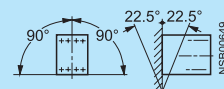
Technical data

Contactor	Size Type	S10 3RT14 66	S12 3RT14 76
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General data

Permissible mounting position

The contactors are designed for operation on a vertical mounting surface.



Mechanical endurance

Oper. cycles 10 million

Electrical endurance

AC-1 utilization category at I_e

Oper. cycles 0.5 million

Rated insulation voltage U_i (pollution degree 3)

V 1000

Rated impulse withstand voltage U_{imp}

kV 8

Safe isolation between coil, auxiliary contacts and main contacts (acc. to DIN VDE 0106 Part 101 and A1 [draft 2/89])

V 690

Permissible ambient temperature

in operation °C –25 ... +60/+55 with AS-Interface
when stored °C –55 ... +80

Degree of protection acc. to IEC 60 947-1 and DIN 40 050

IP 00/open type, coil system IP 20

Shock resistance

Rectangular pulse

g/ms 8.5/5 and 4.2/10

Sine pulse

g/ms 13.4/5 and 6.5/10

Conductor cross-sections

See page 2/165

Electromagnetic compatibility (EMC)

See page 2/106

Short-circuit protection

Main circuit

Fuse links, utilization category gL/gG, NH, Type 3NA

Type of coordination "1" A

500

800

Fuse links, utilization category gR, SITOR, Type 3NE

Type of coordination "2" A

500

710

Auxiliary circuit

Fuse links, utilization category gL/gG (weld-free protection at $I_k \geq 1$ kA)

A

10

DIAZED Type 5SB, NEOZED Type 5SE

or miniature circuit-breaker with C-characteristic ($I_k < 400$ A)

Contactor

Size
Type

S10
3RT14 66

Control circuit

Coil voltage tolerance

AC/DC (UC)

$0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$

Power consumption of solenoid mechanism

(with coil in cold state and rated range $U_{s \min} \dots U_{s \max}$)

AC operation

closing

VA

Conventional op. mechanism

Solid-state op. mechanism

$U_{s \min}$

$U_{s \max}$

$U_{s \min}$

$U_{s \max}$

490

590

400

530

p.f.

0.9

0.9

0.8

0.8

closed

VA

5.6

6.7

4

5

p.f.

0.9

0.9

0.5

0.4

DC operation

closing

W

540

650

440

580

closed

W

6.1

7.4

3.2

3.8

PLC control input (EN 61 131-2/Type 2)

DC 24 V/≤ 30 mA

Operating times

(Break-time = opening time + arcing time)

Conventional op. mechanism

Solid-state op. mechanism

– at $0.8 \times U_{s \min} \dots 1.1 \times U_{s \max}$

closing time
opening time

ms

30 ... 95

40 ... 80

105 ... 145

80 ... 200

45 ... 80

80 ... 100

– at $U_{s \min} \dots U_{s \max}$

closing time
opening time

ms

35 ... 50

50 ... 80

110 ... 130

80 ... 100

50 ... 65

80 ... 100

Arcing time

ms

10 ... 15

10 ... 15

10 ... 15

Contactors and Contactor Assemblies

Contactors for Special Applications

**3RT14 contactors, 3-pole,
for switching resistive loads (AC-1)**

SIRIUS



Technical data

Contactor	Size Type	S12 3RT14 76
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Control circuit

Coil voltage tolerance			AC/DC (UC)		0.8 × U _{s min} ... 1.1 × U _{s max}	
Power consumption of solenoid mechanism			Conventional op. mechanism		Solid-state op. mechanism	
(with coil in cold state and rated range U _{s min} ... U _{s max})			U _{s min}	U _{s max}	U _{s min}	U _{s max}
AC operation	closing	VA	700	830	560	750
	p.f.		0.9	0.9	0.8	0.8
	closed	VA	7.6	9.2	5.4	7
	p.f.		0.9	0.9	0.8	0.8
DC operation	closing	W	770	920	600	800
	closed	W	8.5	10	4	5
PLC control input (EN 61 131-2/Type 2)			DC 24 V≤ 30 mA			
Operating times			Conventional op. mechanism		Solid-state op. mechanism	
(Break-time = opening time + arcing time)					Operation via A1/A2	
– at 0.8 × U _{s min} ... 1.1 × U _{s max}	closing time	ms	45 ... 100		120 ... 150	60 ... 90
	opening time	ms	60 ... 100		80 ... 100	80 ... 100
– at U _{s min} ... U _{s max}	closing time	ms	50 ... 70		125 ... 150	65 ... 80
	opening time	ms	70 ... 100		80 ... 100	80 ... 100
Arcing time		ms	10 ... 15		10 ... 15	10 ... 15

Contactor	Size Type	S10 3RT14 66	S12 3RT14 76
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Main circuit

Load ratings with AC

AC-1 utilization category, switching resistive load					
Rated operational currents I_e	at 40 °C up to 690 V	A	400		690
	at 60 °C up to 690 V	A	380		650 1)
	at 1000 V	A			
Ratings of three-phase loads p.f. = 0.95 (at 60 °C)	at 230 V	kW	145		245
	400 V	kW	250		430
	500 V	kW	315		535
	690 V	kW	430		740
	1000 V	kW			
Minimum conductor cross-section with $I_{e \text{ load}}$	at 40 °C	mm ²	240		2 × 240
	at 60 °C	mm ²	240		2 × 240
Power loss per conducting path		at I_e /AC-1	W	27	55
AC-2 and AC-3 utilization categories With an electrical endurance of 1.3 million operating cycles					
Rated operational current I_e	up to 690 V	A	138		170
	at 230 V	kW	37		55
	400 V	kW	75		90
	500 V	kW	90		110
	690 V	kW	132		160

Load ratings with DC

DC-1 utilization category, switching resistive load ($L/R \leq 1$ ms) Number of conducting paths connected in series			1	2	3	1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V	A	380	380	380	500	500	500
	60 V	A	380	380	380	500	500	500
	110 V	A	33	380	380	33	500	500
	220 V	A	3.8	380	380	3.8	500	500
	440 V	A	0.9	4	11	0.9	4	11
	600 V	A	0.6	2	5.2	0.6	2	5.2
DC-3 and DC-5 utilization categories, shunt and series motors ($L/R \leq 15$ ms)			1	2	3	1	2	3
Rated operational currents I_e (at 60 °C)	up to 24 V	A	380	380	380	500	500	500
	60 V	A	11	380	380	11	500	500
	110 V	A	3	380	380	3	500	500
	220 V	A	0.6	2.5	380	0.6	2.5	500
	440 V	A	0.18	0.65	1.4	0.18	0.65	1.4
	600 V	A	0.125	0.37	0.75	0.125	0.37	0.75

1) Ambient temperature 50 °C
for 3RT14 76-N contactor



Technical data

Contactor	Size Type	S10 3RT14 66	S12 3RT14 76
-----------	--------------	-----------------	-----------------

Main circuit

Operating frequency

Operating frequency z in operating cycles per hour

Contactors without overload relays	No-load op. frequency	1/h	2000
	for AC-1	1/h	600
	for AC-3	1/h	1000

Dependence of the operating frequency z' on the operational current I' and operational voltage U' :

$$z' = z \cdot \frac{I_e}{I'} \cdot \left(\frac{400 \text{ V}}{U'} \right)^{1.5} \text{ 1/h}$$

Conductor cross-sections

Screw connections

Main conductor:
with 3RT19 66-4G box terminal

Finely stranded with end sleeve

mm²Front terminal
connected

70 ... 240

Back terminal
connected

120 ... 185

Both terminals
connectedmin. 2 × 50,
max. 2 × 185

Finely stranded without end sleeve

mm²

70 ... 240

120 ... 185

120 ... 185

min. 2 × 50,
max. 2 × 185

Stranded

mm²

95 ... 300

120 ... 240

120 ... 240

min. 2 × 70,
max. 2 × 240AWG conductor connections, solid or
stranded

mm

3/0 ... 600 kcmil

250 ... 500 kcmil

min. 2 × 2/0,
max. 2 × 500 kcmil

Ribbon cable (qty. × width × thickness)

mm

min. 6 × 9 × 0.8

min. 6 × 9 × 0.8

max. 2 × (20 × 24 × 0.5)

max. 20 × 24 × 0.5

max. 20 × 24 × 0.5

– Terminal screws

Nm

M 12 (hexagon
socket, A/F 5)
20 ... 22 (180 ... 195 lb.in)

Without box terminal/busbar connection

Finely stranded with cable lug

mm²

50 ... 240

If cable lugs acc. to DIN 46 234
are connected, as of a conductor cross-section
of 240 mm² and DIN 46 235 as of a conductor
cross-section of 185 mm², a
3RT19 66-4EA1 terminal cover is necessary
to comply with the phase clearance.

Stranded with cable lug

mm²

70 ... 240

AWG conductor connections, solid or stranded

AWG

2/0 ... 500 kcmil

Connecting bar (max. width)

mm

25

– Terminal screws

Nm

M 10 × 30 (A/F 17)

– Tightening torque

Nm

14 ... 24

(124 ... 210 lb.in)

Auxiliary conductor:

Solid

mm²2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5) acc. to IEC 60 947;
max. 2 × (0.75 ... 4)

Finely stranded with end sleeve

mm²

2 × (0.5 ... 1.5); 2 × (0.75 ... 2.5)

AWG conductor connections, solid or stranded

AWG

2 × (18 ... 14)

– Terminal screws

Nm

M 3 (PZ3)

– Tightening torque

Nm

0.8 ... 1.2 (7 ... 10.3 lb.in)



More information

Contactors	Type		3RT23 16	3RT23 17	3RT23 25	3RT23 26	3RT23 27
	Size		S00		S0		
Dimensions (W x H x D) ³⁾	Width	mm	45 x 57.5 x 73		60 x 85 x 97		
General data							
Permissible mounting position¹⁾							
Mechanical endurance		Operating cycles	30 million		10 million		
Electrical endurance at $I_e/AC-1$		Operating cycles	Approx. 0.5 million				
Rated insulation voltage U_i (pollution degree 3)		V	690				
Permissible ambient temperature	• During operation • During storage	°C °C	-25 ... +60 -55 ... +80				
Degree of protection Acc. to EN 60947-1, Appendix C	Device Connection range		IP20				IP20 IP00
Touch protection acc. to EN 50274			Finger-safe				
Short-circuit protection of contactors without overload relays							
Main circuit							
Fuse links, gG operational class: LV HRC 3NA, DIAZED 5SB, NEOZED 5SE according to IEC 60947-4-1/ EN 60947-4-1	• Type of coordination *1*) • Type of coordination *2*) • Weld-free	A A A	35 20 10		63 20 16		
Control							
Solenoid coil operating range							
• AC operation	- At 50 Hz - At 60 Hz		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s		-- --		
• DC operation	- At 50 °C - At 60 °C		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s		-- --		
• AC/DC operation			--		0.8 ... 1.1 x U_s		
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)							
• AC operation, 50 Hz, standard version	- Closing - P.f. - Closed - P.f.	VA VA VA VA	-- -- -- --		77 0.82 9.8 0.25		
• AC operation, 50/60 Hz, standard version	- Closing - P.f. - Closed - P.f.	VA VA VA VA	27/24.3 0.8/0.75 4.2/3.3 0.25/0.25	37/33 0.8/0.75 5.7/4.4 0.25/0.25	81/79 0.72/0.74 10.5/8.5 0.25/0.28		
• AC operation, 60 Hz, USA, Canada	- Closing - P.f. - Closed - P.f.	VA VA VA VA	31.7 0.77 4.8 0.25	43 0.77 6.5 0.25	87 0.76 9.4 0.28		
• DC operation	- Closing = Closed	W	4		5.9		
Operating times for 0.8 ... 1.1 x U_s²⁾							
Total break time = Opening delay + Arcing time							
• AC operation	- Closing delay - Opening delay	ms ms	8 ... 35 3.5 ... 14	8 ... 33 4 ... 15	9 ... 38 4 ... 16	8 ... 40 4 ... 16	
• DC operation	- Closing delay - Opening delay	ms ms	30 ... 100 7 ... 13		50 ... 170 15 ... 17.5		
• Arcing time		ms	10 ... 15		10		
Main circuit							
AC capacity							
Utilization category AC-1, switching resistive loads							
• Rated operational currents I_e	At 40 °C, up to 690 V At 60 °C, up to 690 V	A A	18 16	22 20	35 30	40 35	50 42
• Rated power for AC loads P.f. = 0.95 (at 40 °C)	At 460 V	HP	5	5	10	10	10
• Minimum conductor cross-section for loads with I_e	At 40 °C At 60 °C	mm ² mm ²	2.5 2.5	2.5 2.5	10 10	10 10	10 10
Utilization category AC-3							
• Rated operational currents I_e	At 60 °C, up to 400 V	A	9	12	15.5	17	17
• Rated power for slipring or squirrel-cage motors at 60 Hz	At 460 V	HP	5	5	10	10	10

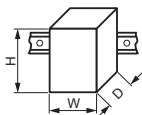
¹⁾ In accordance with the corresponding 3-pole 3RT2. contactors.

²⁾ With size S00, DC operation: Operating times at 0.85 ... 1.1 x U_s .

³⁾ Dimensions for devices with screw terminals. Size S0 for AC operation. DC operation: Depth + 10mm.

Technical specifications

Type				
Size				
Dimensions (W x H x D)				
• With mounted auxiliary switch block				



General technical specifications

Permissible mounting position¹⁾		
Mechanical endurance	Operating cycles	10 million
Electrical endurance at $I_e/AC-1$	Operating cycles	Approx. 0.5 million
Rated insulation voltage U_i (pollution degree 3)	V	690
Permissible ambient temperature		
• During operation	°C	-25 ... +60
• During storage	°C	-55 ... +80
Degree of protection acc. to IEC 60947-1, Appendix C	Device	IP20
	Connection range	
Touch protection acc. to EN 50274		Finger-safe

Short-circuit protection of contactors without overload relays

Main circuit				
Fuse links, operational class gG:				
LV HRC, 3NA; DIAZED, 5SB; NEOZED, 5SE	• Type of coordination "1" ¹⁾	A	on request	250
according to IEC 60947-4-1/EN 60947-4-1	• Type of coordination "2" ¹⁾	A	on request	125
	• Weld-free	A	on request	63
				250
				160
				100

Control circuit

Coil operating range (AC/DC)			0.8 ... 1.1 x U_g
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_g)			
• AC operation, 50 Hz	- Closing	VA	190
	- P.f.	VA	0.72
	- Closed	VA	16
	- P.f.	VA	0.37
• AC operation, 50/60 Hz	- Closing	VA	210/188
	- P.f.	VA	0.69/0.65
	- Closed	VA	17.2/16.5
	- P.f.	VA	0.36/0.3
• DC operation	- Closing	W	15
	= Closed		

Operating times for 0.8 ... 1.1 x U_g ²⁾

Total break time = Opening delay + Arcing time			
• DC operation	- Closing delay	ms	110 ... 200
	- Opening delay	ms	14 ... 20
• AC operation	- Closing delay	ms	10 ... 80
	- Opening delay	ms	10 ... 18
• Arcing time		ms	10 ... 20
			10 ... 15

Main circuit

AC capacity

Utilization category AC-1, switching resistive loads

• Rated operational currents I_e	At 40 °C, up to 690 V	A	60	110	140
	At 60 °C, up to 690 V	A	55	100	120
• Rated power for AC loads	At 230 V	kW	21	42	53
P.f. = 0.95 (at 40 °C)	400 V	kW	36	72	92
• Minimum conductor cross-section	At 40 °C	mm ²	16	50	50
for loads with I_e	At 60 °C	mm ²	25	50	50

Utilization categories AC-2 and AC-3

• Rated operational currents I_e	At 60 °C, up to 400 V	A	--	--	--
• Rated power for slipring	At 230 V	kW	--	--	--
or squirrel-cage motors at 50 and 60 Hz	400 V	kW	--	--	--

¹⁾ In accordance with the corresponding 3-pole 3RT1 contactors.

²⁾ With size S00, DC operation: Operating times for 0.85 ... 1.1 x U_g

Contactors and Contactor Assemblies

Contactors for Special Applications

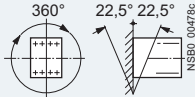

**3RT25 contactors, 4-pole (2 NO + 2 NC),
for switching motors**



• Revised •
09/22/15

SIRIUS



Technical specifications

Type		3RT2516	3RT2517	3RT2518	3RT2526	3RT2535	3RT2536
Size		S00			S0	S2	
General technical specifications							
Permissible mounting position							
The contactors are designed for operation on a vertical mounting surface.							
Upright mounting position		 Special version required					
Mechanical endurance	Operating cycles	30 million			10 million		
Electrical endurance at I_e /AC-1	Operating cycles	Approx. 0.5 million					
Rated insulation voltage U_i (Pollution degree 3)	V	690					
Permissible ambient temperature							
• During operation	°C	-25 ... +60			-25 ... +60		
• During storage	°C	-55 ... +80			-55 ... +80		
Degree of protection acc. to IEC 60947-1, Appendix C		IP20					
Touch protection acc. to EN 50274		Finger-safe					
Short-circuit protection							
Main circuit							
Fuse links, operational class gG: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE according to IEC 60947-4-1/EN 60947-4-1							
• Type of coordination "1"	A	35			63	125	160
• Type of coordination "2"	A	20			35	63	80
• Weld-free	A	10			16	--	--

Type		3RT2516	3RT2517	3RT2518	3RT2536	3RT2537
Size		S00			S2	
Dimensions (W x H x D) ¹⁾		45 x 57.5 x 73 / 45 x 70 x 73			74.5 x 113.5 x 130 / 74.5 x 113.5 x 130	
• with mounted auxiliary switch block		45 x 57.5 x 116 / 45 x 70 x 121			74.5 x 113.5 x 173.5 / 74.5 x 113.5 x 177.5	
Type		3RT2526				
Size		S0				
Dimensions (W x H x D) for AC operation ¹⁾²⁾		mm	60 x 85 x 97 / 60 x 101.5 x 97			
• with mounted auxiliary switch block		mm	60 x 85 x 141 / 60 x 101.5 x 144			
Dimensions (W x H x D) for DC operation ¹⁾²⁾		mm	60 x 85 x 107 / 60 x 101.5 x 107			
• with mounted auxiliary switch block	mm	60 x 85 x 151 / 60 x 101.5 x 154				

¹⁾ Dimensions for devices with screw terminals/spring-type terminals.

²⁾ For size S0, devices for AC and DC operation differ in depth. The following applies: Depth (DC) = Depth (AC) + 10 mm.



• Revised •
09/22/15

Contactors and Contactor Assemblies

Contactors for Special Applications

3RT25 contactors, 4-pole (2 NO + 2 NC),
for switching motors

Type	3RT2516	3RT2517	3RT2518	3RT2526	3RT2535	3RT2536
Size	S00			S0	S2	
Control circuit						
Solenoid coil operating range						
• AC operation	at 50 Hz at 60 Hz	0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s		0.8 ... 1.1 x U_s 0.8 ... 1.1 x U_s		
• DC operation	up to 50 °C up to 60 °C	0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s			-- --	
• AC/DC operation		--			0.8 x U_{smin} ... 1.1 x U_{smax}	
Power consumption of the solenoid coils (for cold coil and 1.0 x U_s)		see 3RT2316	see 3RT2317	see 3RT2326	see 3RT233	
Operating times for 0.8 to 1.1 x U_s (Total break time = Opening delay + Arcing time)		see 3RT2316	see 3RT2317	see 3RT2326	see 3RT233	
Main circuit						
Load rating with AC						
Utilization category AC-1						
Switching resistive loads						
• Rated operational currents I_e	at 40 °C up to 690 V A at 60 °C up to 690 V A	18 16	22 20	40 35	60 55	70 60
• Rated power for AC loads p.f. = 0.95 (at 60 °C)	at 230 V kW 400 V kW	6 10.5	7.5 13	13.3 23	21 36	23 39
• Minimum conductor cross-section for loads with I_e	at 40 °C mm ²	2.5	2.5	10	16	25
Utilization categories AC-2 and AC-3						
• Rated operational currents I_e (at 60 °C)	NO up to 400 V A NC up to 400 V A	9 9	12 9	16 9	AC ¹⁾ 25 DC ¹⁾ 20	35 35
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	NO at 230 V kW NC at 230 V kW NO at 400 V kW NC at 400 V kW	2.2 2.2 4 4	3 2.2 5.5 4	4 2.2 7.5 4	5.5 5.5 11 11	5.5 5.5 18.5 18.5
						11 11 22 22
Load rating with DC						
Utilization category DC-1						
Switching resistive loads ($L/R \leq 1$ ms)						
• Rated operational currents I_e (at 60 °C)						
- 1 conducting path	up to 24 V A 60 V A 110 V A 220 V A 440 V A	16 16 2.1 0.8 0.6	20 20 2.1 0.8 0.6	35 20 4.5 1 0.4	55 23 4.5 1 0.4	60
- 2 conducting paths in series	up to 24 V A 60 V A 110 V A 220 V A 440 V A	16 16 12 1.6 0.8	20 20 12 1.6 0.8	35 35 35 5 1	55 45 45 5 1	
Utilization category DC-3/DC-5²⁾						
Shunt-wound and series-wound motors ($L/R \leq 15$ ms)						
• Rated operational currents I_e (at 60 °C)						
- 1 conducting path	up to 24 V A 60 V A 110 V A 220 V A 440 V A	16 0.5 0.15 0.75 --	20 0.5 0.15 0.75 --	20 5 2.5 1 0.09	35 6 2.5 1 0.1	
- 2 conducting paths in series	up to 24 V A 60 V A 110 V A 220 V A 440 V A	16 5 0.35 -- --	20 5 0.35 -- --	35 35 15 3 0.27	55 45 25 5 0.27	

¹⁾ Values for devices with AC and DC operation: for 3RT25 26 with DC operation, different values apply to AC-2 and AC-3 for the NC.

²⁾ For $U_s > 24$ V, the rated operational currents I_e for the NC contact conducting paths are 50 % of the values for the NO contact conducting paths.

Contactors and Contactor Assemblies

Contactors for Special Applications

SIRIUS



3RT16 capacitor contactors

Technical specifications

All technical specifications not mentioned in the table below are identical to those of the 3RT10 17 contactors for size S00, to

those of the 3RT10 26 contactors for size S0 and to those of the 3RT10 45 contactors for size S3.

Type				
Size				
Dimensions (W x H x D) including auxiliary switches and connecting cables				
	mm			
		3RT16 17-.A..3 S00 45 x 101 x 105	3RT16 27-.A..1 S0 45 x 100 x 130	3RT16 47-.A..1 S3 70 x 167 x 183
General technical specifications				
Capacitor rating at rated power (utilization category AC-6b)	230 V, 50/60 Hz kvar 400 V, 50/60 Hz kvar 525 V, 50/60 Hz kvar 690 V, 50/60 Hz kvar	3 ... 7.5 5 ... 12.5 7.5 ... 15 10 ... 21	3.5 ... 15 6 ... 25 7.8 ... 30 10 ... 42	3.5 ... 30 5 ... 50 7.5 ... 60 10 ... 84
Auxiliary contacts mounted (unassigned)		1 NO + 1 NC	1 NO	
Auxiliary contacts mountable (lateral), not for sizes S00 and S0		--		2 NC + 2 NO or 1 NO + 1 NC
Max. switching frequency	h ⁻¹	180	100	
Electrical endurance	Operating cycles	> 250000	> 150000	> 100000
Ambient temperature	°C	60		
Short-circuit protection		1.6 ... 2.2 x I _θ		
Coil operating range		0.8 ... 1.1 x U _s		
Conductor cross-sections (1 or 2 conductors connectable)				
Main conductors		Screw terminals		
• Solid	mm ²	2 x (0.5 ... 1.5) ²⁾ ; 2 x (0.75 ... 2.5) ²⁾ according to IEC 60947; max. 2 x (1 ... 4) ²⁾	2 x (1 ... 2.5) ²⁾ ; 2 x (2.5 ... 6) ²⁾ according to IEC 60947; max. 1 x 10 ¹⁾²⁾	--
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5) ²⁾ ; 2 x (0.75 ... 2.5) ²⁾	2 x (1 ... 2.5) ²⁾ ; 2 x (2.5 ... 6) ¹⁾²⁾	--
• AWG cables				
- Solid	AWG	2 x (20 ... 16)	2 x (16 ... 12)	--
- Solid or stranded	AWG	2 x (18 ... 14)	2 x (14 ... 10)	--
- Stranded	AWG	1 x 12	1 x 8	--
• Terminal screws		M3	M4 (Pozidriv size 2)	--
- Tightening torque	Nm lb.in	0.8 ... 1.2 7 ... 10.3	2 ... 2.5 18 ... 22	--





¹⁾ 3RV19 25-5AB feeder terminal for 16 mm².




²⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.



More information

All technical specifications not mentioned in the table below are identical to those of the 3RT20 contactors for switching motors (see 2/128-2/130)

Contactors	Type		3RT20 1.-.HB4.	3RT20 1.-.JB4.	3RT20 1.-.KB4.	3RT20 2.-.KB4.
	Size		S00	S00	S00	S0
	Width	mm	45	45	45	45
General data						
Mechanical endurance		Operating cycles	30 million			10 million
Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400			
Control						
Solenoid coil operating range			0.7 ... 1.25 x U _s			
Power consumption of the solenoid coil		At U _s 17 V W	1.6			2.3
(for cold coil)		24 V W	2.8			4.5
Closing = Closed		30 V W	4.4			7
Permissible residual current of the electronics (for 0 signal)			< 10 mA x (24 V/U _s)			< 6 mA x (24 V/U _s)
Overvoltage configuration of the solenoid coil			Without overvoltage damping 	With diode 	With suppressor diode 	With varistor 
Operating times of the coupling contactors						
• Closing						
- At 17 V		ON-delay NO	ms	40 ... 130		70 ... 270
		OFF-delay NC	ms	30 ... 80		60 ... 250
- At 24 V		ON-delay NO	ms	35 ... 60		65 ... 90
		OFF-delay NC	ms	25 ... 40		55 ... 80
- At 30 V		ON-delay NO	ms	25 ... 50		52 ... 65
		OFF-delay NC	ms	15 ... 30		43 ... 57
• Closing at 17 ... 30 V		OFF-delay NO	ms	7 ... 20	38 ... 65	19 ... 21
		ON-delay NC	ms	20 ... 30	55 ... 75	25 ... 31
					7 ... 20	
					20 ... 30	

Contactors	Type		3RT20 1.-1MB4.-0KT0	3RT20 1.-1VB4.	3RT20 1.-1WB4.
	Size		S00	S00	S00
	Width	mm	45	45	45
General data					
Mechanical endurance		Operating cycles	30 million		
Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400		
Control					
Solenoid coil operating range			0.85 ... 1.85 x U _s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed		At U _s 24 V W	1.6		
Permissible residual current, upright mounting position			On request		
Overvoltage configuration of the solenoid coil			Without overvoltage damping 	With diode 	With suppressor diode 
Operating times of the coupling contactors					
• Closing					
- At 20.5 V	ON-delay NO	ms	30 ... 120		
	OFF-delay NC	ms	20 ... 110		
- At 24 V	ON-delay NO	ms	25 ... 90		
	OFF-delay NC	ms	15 ... 80		
- At 44 V	ON-delay NO	ms	15 ... 60		
	OFF-delay NC	ms	10 ... 50		
• Opening					
	OFF-delay NO	ms	5 ... 20	20 ... 80	5 ... 20
	ON-delay NC	ms	10 ... 30	30 ... 90	10 ... 30



Overview

Standards

IEC 60947-1, EN 60947-1,
IEC 60947-4-1, EN 60947-4-1,
IEC 60947-5-1, EN 60947-5-1 (auxiliary switches)

The 3TF68/69 contactors are climate-proof.

They are finger-safe according to EN 50274. Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices (see [Accessories and Spare Parts](#) on page 2/54).

Main contacts

Contact erosion indication with 3TF68/69 vacuum contactors

The contact erosion of the vacuum interrupters can be checked during operation with the help of 3 white double slides on the contactor base. If the distance indicated by one of the double slides is < 0.5 mm while the contactor is in the closed position, then the vacuum interrupter must be replaced. To ensure maximum reliability, it is recommended to replace all 3 vacuum interrupters simultaneously.

Auxiliary contacts

Contact reliability

These auxiliary contacts are particularly suitable for solid-state circuits with currents ≥ 1 mA at a voltage ≥ 17 V.

Electromagnetic compatibility

The 3TF68/69...**C** contactors for AC operation are fitted with an electronically controlled solenoid operating mechanism with a high interference immunity (for EMC values see page 3/115). The solenoid coil is connected to varistors for protection against overvoltages.

The 3TF68/69...**Q**.. contactors for AC operation are designed for operation in systems with AC control supply voltage which is subject to strong interference. The solenoid systems of these contactors are configured in the DC economy circuit with rectification. The rectifier bridge is connected to varistors for protection against overvoltages.

Protection of the main current paths

An integrated RC varistor connection for the main current paths dampens the switching overvoltage rises to safe values. This prevents multiple restricting. It can therefore be assumed that the motor winding cannot be damaged by switching overvoltages with steep voltage rises.

Note:

During operation in installations in which the emitted interference limits cannot be observed, e.g. when used for output contactors in converters, 3TF68/69...**Q** contactors without a main current path circuit are recommended.

Technical specifications

Contactor	Type	3TF68 and 3TF69	
Rated data of the auxiliary contacts		Acc. to IEC 60947-5-1	
Rated insulation voltage U_i (pollution degree 3)	V	690	
Conventional thermal current I_{th} = Rated operational current I_e /AC-12	A	10	
AC load			
Rated operational current I_e /AC-15/AC-14			
• For rated operational voltage U_e			
- At 24 V	A	10	
- At 110 V	A	10	
- At 125 V	A	10	
- At 220 V	A	6	
- At 230 V	A	5.6	
- At 380 V	A	4	
- At 400 V	A	3.6	
- At 500 V	A	2.5	
- At 660 V	A	2.5	
- At 690 V	A	2.3	
DC load			
Rated operational current I_e /DC-12			
• For rated operational voltage U_e			
- At 24 V	A	10	
- At 60 V	A	10	
- At 110 V	A	3.2	
- At 125 V	A	2.5	
- At 220 V	A	0.9	
- At 440 V	A	0.33	
- At 600 V	A	0.22	
Rated operational current I_e /DC-13			
• For rated operational voltage U_e			
- At 24 V	A	10	Auxiliary contacts with delayed NC contact: NS = No specification
- At 60 V	A	5	
- At 110 V	A	1.14	
- At 125 V	A	0.98	
- At 220 V	A	0.48	
- At 440 V	A	0.13	
- At 600 V	A	0.07	
- At 600 V	A	0.07	
Ⓢ and Ⓢ rated data of the auxiliary contacts			
Rated voltage, max.	V AC	600	
Switching capacity		A 600, P 600	



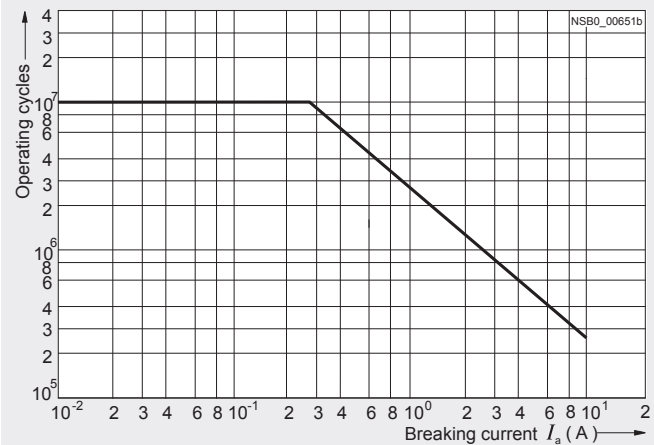
Contactor

Contact endurance of the auxiliary contacts

The contact endurance for utilization category AC-12 or AC-15/AC-14 depends mainly on the breaking current. It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system.

The characteristic curves apply to 230 V AC.

3TF68 and 3TF69



Contact erosion indication with vacuum contactors

The contact erosion of the vacuum interrupters can be checked during operation with the help of 3 white double slides on the contactor base.

If the distance indicated by one of the double slides is < 0.5 mm while the contactor is in the closed position, the vacuum interrupter must be replaced. To ensure maximum reliability, it is recommended to replace all 3 vacuum interrupters.

3TF68 and 3TF69

Contact endurance of the main contacts

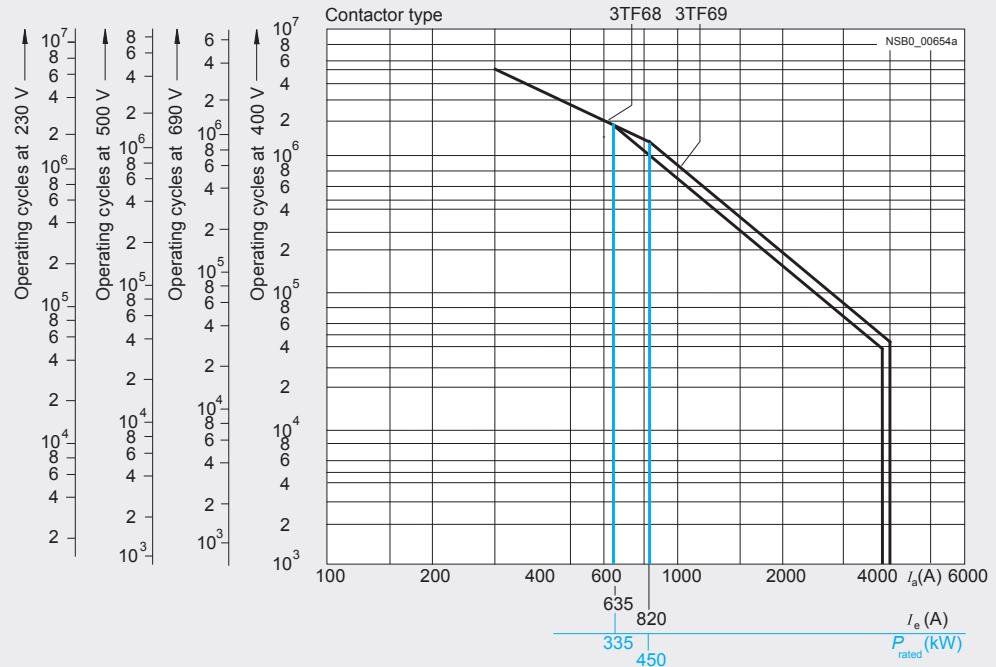


Diagram legend:

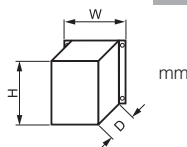
P_{rated} = Rated power for squirrel-cage motors at 400 V

I_a = Breaking current

I_e = Rated operational current

3TF68 and 3TF69 Vacuum contactors

Type
Size
Dimensions (W x H x D)



3TF68

14

230 x 276 x 237

3TF69

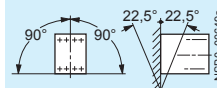
14

230 x 295 x 237

General data

Permissible mounting position, installation instructions^{1) 2)}

The contactors are designed for operation on a vertical mounting surface.



Mechanical endurance

Operating cycles 5 million

Electrical endurance

Operating cycles³⁾

Rated insulation voltage U_i
(pollution degree 3)

kV 1

Rated impulse withstand voltage U_{imp}

kV 8

Protective separation between the coil and the main contacts acc. to IEC 60947-1, Appendix N

kV 1

Mirror contacts

A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.

One NC contact each must be connected in series for the right and left auxiliary switch block respectively.

Yes, acc. to IEC 60947-4-1, Appendix F

Permissible ambient temperature

- During operation⁵⁾
- During storage

°C -25 ... +55
°C -55 ... +80

Degree of protection acc. to IEC 60947-1, Appendix C

IP00/open (where applicable, use additional terminal covers)

Touch protection acc. to EN 50274

Finger-safe with cover

Shock resistance

- Rectangular pulse

- AC operation
- DC operation

g/ms 8.1/5 and 4.7/10
g/ms 9/5 and 5.7/10

9.5/5 and 5.7/10
8.6/5 and 5.1/10

- Sine pulse

- AC operation
- DC operation

g/ms 12.8/5 and 7.4/10
g/ms 14.4/5 and 9.1/10

13.5/5 and 7.8/10
13.5/5 and 7.8/10

Conductor cross-sections

See page 2/177.

Electromagnetic compatibility (EMC)

See page 2/106.

Short-circuit protection

Main circuit

Fuse links, gG operational class:

LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE according to IEC 60947-4-1/EN 60947-4-1

- Type of coordination "1"
- Type of coordination "2"
- Weld-free⁴⁾

A 1000
A 500
A 400

1250
630
500

Auxiliary circuit

- Short-circuit test with fuse links of gG operational class: LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE with $I_k = 1$ kA acc. to IEC 60947-5-1

A 10

- Test with miniature circuit breaker up to 230 V with C characteristic: Short-circuit current $I_k = 400$ A acc. to IEC 60947-5-1

A 10

¹⁾ To easily replace the laterally mounted auxiliary switches it is recommended to maintain a minimum distance of 30 mm between the contactors.

²⁾ If mounted at a 90° angle (conducting paths are horizontally above each other), the switching frequency is reduced by 80% compared with the normal values.

³⁾ See "Endurance of the auxiliary contacts", page 2/173.

⁴⁾ Test conditions according to IEC 60947-4-1.

⁵⁾ For ambient temperatures > 55°C, only 3TF6.33-Q...-Z A02 contactors (= without connection of the main current path circuits) can be used. Then derating is also possible with these contactors:
- AC-1: $I_{th} = 782$ A, 644 operating cycles/h;
- AC-3: operating range 0.85-1.05 x U_s , 460 operating cycles/hour, mechanical endurance 5 million operating cycles, lateral clearance 10 mm



Contactor	Type	3TF68	3TF69	
	Size	14	14	
Control				
Coil operating range		0.8 x U _{s min} ... 1.1 x U _{s max}		
Power consumption of the solenoid coils (when coil is cold and 1.0 x U _s)				
• AC operation, U _{s max}	- Closing - Closed	VA/p.f. VA/p.f.	1850/1 49/0.15	950/0.98 30.6/0.31
• AC operation, U _{s min}	- Closing - Closed	VA/p.f. VA/p.f.	1200/1 13.5/0.47	600/0.98 12.9/0.43
• DC economy circuit ¹⁾	- Closing at 24 V - Closed	W W	1010 28	960 20.6
For contactors of type 3TF68/69...-Q:				
• AC operation, U _{s min} ²⁾	- Closing - Closed	VA/p.f. VA/p.f.	1000/0.99 11/1	1150/0.99 11/1
Operating times for 0.8 ... 1.1 x U _s (Total break time = Opening delay + Arcing time)		(Values apply to cold and warm coil)		
• AC operation	- Closing delay - Opening delay	ms ms	70 ... 120 (22 ... 65) ³⁾ 70 ... 100	80 ... 120 70 ... 80
• DC economy circuit	- Closing delay - Opening delay	ms ms	76 ... 110 50	86 ... 280 19 ... 25
• Arcing time		ms	10 ... 15	10
For contactors of type 3TF68/69...-Q:				
• AC operation	- Closing delay - Opening delay	ms ms	35 ... 90 65 ... 90	45 ... 160 30 ... 80
Operating times for 1.0 x U _s (Total break time = Opening delay + Arcing time)				
• AC operation	- Closing delay - Opening delay	ms ms	80 ... 100 (30 ... 45) ³⁾ 70 ... 100	85 ... 100 70
• DC economy circuit	- Closing delay - Opening delay	ms ms	80 ... 90 50	90 ... 125 19 ... 25
Minimum command duration for closing	Standard Reduced make-time	ms ms	120 90	120 --
Minimum interval time between two ON commands		ms	100	300

¹⁾ At 24 V DC; for further voltages, deviations of up to ± 10 % are possible.

²⁾ Including reversing contactor.

³⁾ Values in brackets apply to contactors with reduced operating times.

Contactor	Type	3TF6. 44- .CF7	3TF6. 44- .CM7	3TF6. 44- .CP7	3TF6. 44- .CQ7	3TF6. 44- .CS7
Electromagnetic compatibility						
Rated control supply voltage U_s	V AC	110 ... 132	200 ... 240	230 ... 277	380 ... 460	500 ... 600
Overvoltage type acc. to IEC 60801		Burst/Surge				
Degree of severity acc. to IEC 60801						
• Burst		3	4	4	4	4
• Surge		4	4	4	4	4
Overvoltage resistance						
• Burst	kV	2	4	4	4	4
• Surge	kV	6	5	5	6	6



Contactor	Type		3TF68	3TF69
	Size		14	14
Main circuit				
AC capacity				
Utilization category AC-1				
Switching resistive loads				
• Rated operational currents I_e	At 40 °C up to 690 V	A	700	910
	At 55 °C up to 690 V	A	630	850
	At 55 °C up to 1000 V	A	450	800
• Rated power for AC loads with p.f. = 0.95 at 55°C	230 V	kW	240	323
	400 V	kW	415	558
	500 V	kW	545	735
	690 V	kW	720	970
	1000 V	kW	780	1385
• Minimum conductor cross-sections for loads with I_e	At 40°C	mm ²	2 x 240	$I_e \geq 800$ A: 2 x 60 x 5 (copper busbars)
	At 55°C	mm ²	2 x 185	$I_e < 800$ A: 2 x 240
Utilization categories AC-2 and AC-3				
• Rated operational currents I_e	Up to 690 V	A	630	820
	1000 V	A	435	580
• Rated power for slipping or squirrel-cage motors at 50 Hz and 60 Hz	At 230 V	kW	200	260
	400 V	kW	347	450
	500 V	kW	434	600
	690 V	kW	600	800
	1000 V	kW	600	800
Thermal load capacity	10 s current	A	5 040	7 000
Power loss per conducting path	At I_e /AC-3	W	45	70
Utilization category AC-4 (for $I_a = 6 \times I_e$)				
• Rated operational current I_e	Up to 690 V	A	610	690
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 400 V	kW	355	400
The following applies to a contact endurance of about 200000 operating cycles:				
• Rated operational currents I_e	Up to 690 V	A	300	360
	1000 V	A	210	250
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 230 V	kW	97	110
	400 V	kW	168	191
	500 V ¹⁾	kW	210	250
	690 V ¹⁾	kW	278	335
	1000 V ¹⁾	A	290	350
Switching frequency				
Switching frequency z in operating cycles/hour				
• Contactors without overload relays	No-load switching frequency AC	1/h	2000	1000
	No-load switching frequency DC	1/h	1000	1000
	AC-1	1/h	700	700
	AC-2	1/h	200	200
	AC-3	1/h	500	500
• Contactors with overload relays (mean value)	AC-4	1/h	150	150
		1/h	15	15

¹⁾ Max. permissible rated operational current I_e /AC-4 = I_e /AC-3 up to 500 V, for reduced contact endurance and reduced switching frequency.



Contactor	Type Size	3TF68 14	3TF69 14
Conductor cross-sections			
Main conductors:		Screw terminals	
<ul style="list-style-type: none"> Busbar connections <ul style="list-style-type: none"> Finely stranded with cable lug Stranded with cable lug Solid or stranded Connecting bar (max. width) Terminal screw <ul style="list-style-type: none"> Tightening torque With box terminal¹⁾ <ul style="list-style-type: none"> Connectable copper bars Width Max. thickness Terminal screw Tightening torque 	mm ² mm ² AWG mm Nm mm mm Nm lb.in	50 ... 240 70 ... 240 2/0 ... 500 MCM 50 M10 x 30 14 ... 24 (124 ... 210 lb.in) 15 ... 25 1 x 26 or 2 x 11 A/F 6 (hexagon socket) 25 ... 40 221 ... 354	50 ... 240 50 ... 240 2/0 ... 500 MCM 60 (U _e ≤ 690 V) 50 (U _e > 690 V) M12 x 40 20 ... 35 (177 ... 310 lb.in) 15 ... 38 1 x 46 or 2 x 18 A/F 8 (hexagon socket) 35 ... 50 266 ... 443
Auxiliary conductors:			
<ul style="list-style-type: none"> Solid Finely stranded with end sleeve Pin-end connector acc. to DIN 46231 Solid or stranded Tightening torque 	mm ² mm ² mm ² AWG Nm lb.in	2 x (0.5 ... 1) ²⁾ /2 x (1 ... 2.5) ²⁾ 2 x (0.5 ... 1) ²⁾ /2 x (0.75 ... 2.5) ²⁾ 2 x (1 ... 1.5) 2 x (18 ... 12) 0.8 ... 1.4 7 ... 12	

¹⁾ See "Accessories and Spare Parts", page 2/54.

²⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

Contactor	Type Size	3TF68 14	3TF69 14
Ⓢ and Ⓜ rated data			
Rated insulation voltage	V AC	600	600
Uninterrupted current			
<ul style="list-style-type: none"> Open and enclosed 	A	630	820
Maximum horsepower ratings (Ⓢ and Ⓜ approved values)			
<ul style="list-style-type: none"> Rated power for induction motors at 60 Hz <ul style="list-style-type: none"> At 200 V At 230 V At 460 V At 575 V 	hp hp hp hp	231 266 530 664	290 350 700 860
NEMA/EEMAC ratings			
SIZE	hp	6	7
<ul style="list-style-type: none"> Uninterrupted current <ul style="list-style-type: none"> Open Enclosed Rated power for induction motors at 60 Hz <ul style="list-style-type: none"> At 200 V At 230 V At 460 V At 575 V 	A A hp hp hp hp	600 540 150 200 400 400	820 810 -- 300 600 600
Overload relays	Type	3RB12 .	
<ul style="list-style-type: none"> Setting range 	A	200 ... 820	



3TC contactors

Overview

3TC4 and 3TC5

IEC 60947-1, EN 60947-1,
IEC 60947-4-1, EN 60947-4-1

The contactors are finger-safe according to EN 50274. Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices.

The DC motor ratings given in the tables are applicable to the DC-3 and DC-5 utilization categories with two-pole switching of the load or with the two conducting paths of the contactor connected in series.

One contactor conducting path can switch full power up to 220 V. The ratings for higher voltages are available on request.

3TC7

IEC 60947-4-1, EN 60947-4-1.

The contactors are suitable for use in any climate. They are suitable for switching and controlling DC motors as well as all other DC circuits.

The solenoid excitation is configured for a particularly large operating range. It is between 0.7 or 0.8 to 1.2 $\times U_N$.

3TC74 contactors can be used at up to 750 V/400 A and 50 Hz in AC-1 operation.

Application

The contactors are suitable for switching and controlling DC motors as well as all other DC circuits.

A version with an especially large coil operating range is available for operation in electrically driven vehicles and in switchgears with significant fluctuations in the actuating voltage

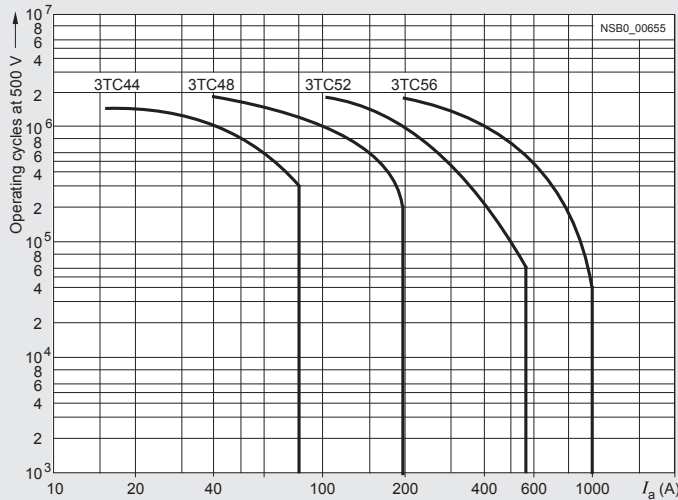
Technical specifications

Contactors	Type	3TC4 and 3TC7	3TC5
Rated data of the auxiliary contacts			
Rated insulation voltage U_i (pollution degree 3)	V	690	
Conventional thermal current I_{th} = Rated operational current $I_e/AC-12$	A	10	10
AC load			
Rated operational current $I_e/AC-15/AC-14$ • For rated operational voltage U_e			
24 V	A	10	10
110 V	A	10	10
125 V	A	10	10
220 V	A	6	6
230 V	A	5.6	5.6
380 V	A	4	4
400 V	A	3.6	3.6
500 V	A	2.5	2.5
660 V	A	2.5	2.5
690 V	A	--	--
DC load			
Rated operational current $I_e/DC-12$ • For rated operational voltage U_e			
24 V	A	10	10
60 V	A	10	10
110 V	A	3.2	8
125 V	A	2.5	6
220 V	A	0.9	2
440 V	A	0.33	0.6
600 V	A	0.22	0.4
Rated operational current $I_e/DC-13$ • For rated operational voltage U_e			
24 V	A	10	10
60 V	A	5	5
110 V	A	1.14	2.4
125 V	A	0.98	2.1
220 V	A	0.48	1.1
440 V	A	0.13	0.32
600 V	A	0.07	0.21



Contactors	Type	3TC44 ... 3TC56
Ⓒ and Ⓓ rated data of the auxiliary contacts		
Rated voltage, max.	V AC	600
Switching capacity		A 600, P 600

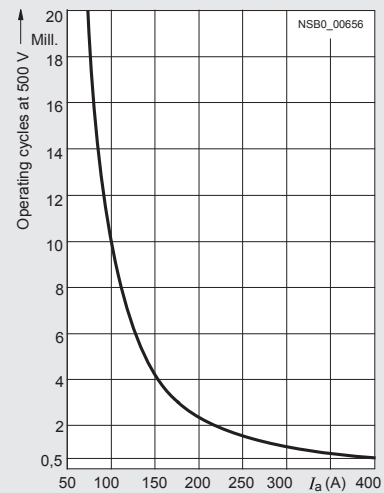
Contactors	Type	3TC44 ... 3TC78
Contact endurance of the main contacts		



3TC44 to 3TC56 contactors

Legend for the diagrams:

I_a = Breaking current



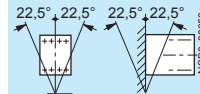
3TC74 and 3TC78 contactors

Contactors	Type	3TC44	3TC48	3TC52	3TC56
	Size	2	4	8	12

General technical specifications

Permissible mounting positions

The contactors are designed for operation on a vertical mounting surface.



Mechanical endurance	Operating cycles	10 million			
Electrical endurance	Operating cycles	1)			
Rated insulation voltage U_i (pollution degree 3)	V	800		1000	
Protective separation between the coil and the main contacts acc. to IEC 60947-1, Appendix N	V	Up to 300		Up to 660	
Mirror contacts ²⁾ A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.		Yes, acc. to IEC 60947-4-1, Appendix F			
Permissible ambient temperature	°C	-25 ... +55			
	°C	-50 ... +80			
Degree of protection acc. to IEC 60947-1, Appendix C		IP00/open, for AC operation, coil assembly IP40			
Shock resistance	Rectangular pulse	g/ms	7.5/5 and 3.4/10	10/5 and 5/10	12/5 and 5.5/10

Short-circuit protection

Main circuit

Fuse links, operational class gG:

LV HRC, type 3NA; DIAZED, type 5SB; NEOZED, type 5SE

• Type of coordination "1"

• Type of coordination "2"

Auxiliary circuit

• Short-circuit test with fuse links of gG operational class:

DIAZED, type 5SB; NEOZED, type 5SE

with short-circuit current $I_k = 1$ kA acc. to IEC 60947-5-1

• Test with miniature circuit breaker up to 230 V with C characteristic:

Short-circuit current $I_k = 400$ A acc. to IEC 60947-5-1

1) See the endurance diagram above.

2) For 3TC44, one NC contact each must be connected in series for the right and left auxiliary switch block respectively.



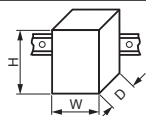
3TC contactors

Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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¹⁾ The opening delay times can increase if the contactor coils are damped against voltage peaks. Only 3TC44 contactors are allowed to be fitted with diodes.



Type
Design
Dimensions



mm

3TC74**1-pole contactors**

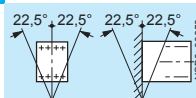
78 x 352 x 276

3TC78**2-pole contactors**

160 x 366 x 290

General technical specifications**Permissible mounting positions**

The contactors are designed for operation on a vertical mounting surface.



Mechanical endurance	Operating cycles	30 million
Electrical endurance	Operating cycles	1)
Rated insulation voltage U_i (pollution degree 3)	V	1500
Rated impulse withstand voltage U_{imp}	kV	8
Protective separation between the coil and the main contacts acc. to IEC 60947-1, Appendix N	V	630
Permissible ambient temperature	°C	-25 ... +55
Degree of protection acc. to IEC 60947-1, Appendix C		IP00/open

Short-circuit protection**Main circuit**

Fuse links, operational class gG:

LV HRC, type 3NA

- Type of coordination "1"
- Type of coordination "2"

A

630

A

500

Auxiliary circuits

- Short-circuit test with fuse links of gG operational class:

DIAZED, type 5SB; NEOZED, type 5SE

with short-circuit current $I_k = 1$ kA acc. to IEC 60947-5-1

- Test with miniature circuit breaker up to 230 V with C characteristic: Short-circuit current $I_k = 400$ A acc. to IEC 60947-5-1

A

16

A

10

Control circuits**Coil operating range**

- DC operation

At $U_c = 24$ VAt $U_c > 24$ V0.8 ... 1.2 x U_s 0.7 ... 1.2 x U_s

- AC operation

At $U_c = 24$ VAt $U_c > 24$ V0.7 ... 1.15 x U_s 0.7 ... 1.14 x U_s **Power consumption of the solenoid coils** (when coil is cold and 1.0 x U_s)

- DC operation

Closing = Closed

W

46

92

- AC operation, 50 Hz

Closing,

Closed

VA

80

160

0.95

0.95

Operating times

(Total break time = Opening delay + Arcing time)

- AC and DC operation

- Closing delay

ms

60 ... 100

- Opening delay

ms

20 ... 35

- Arcing time at 0.06 ... 4 x I_e

ms

40 ... 70

(The values apply up to and including 15 % undervoltage, 10 % overvoltage, as well as when the coil is cold and warm)

Main circuit**Load rating with DC****Utilization category DC-1, switching resistive loads ($L/R \leq 1$ ms)**

- Rated operational current $I_{th}/DC-1$ (at 55 °C)

A

500

500

- Minimum conductor cross-section

mm²

2 x 150

2 x 150

- Rated power

At 220 V

kW

110

110

440 V

kW

220

220

600 V

kW

300

300

750 V

kW

375

375

1200 V

kW

—

600

1500 V

kW

—

750

- Critical currents, without arc extinction

At 440 V

A

≤ 7

—

600 V

A

≤ 13

—

750 V

A

≤ 15

—

≤ 800 V

A

—

≤ 7

1200 V

A

—

≤ 13

1500 V

A

—

≤ 15

Utilization categories DC-3 and DC-5, switching DC motors

2)

Permissible rated current for regenerative braking At 110 ... 600 V

A

400

Switching frequency**Switching frequency z** in operating cycles/hour

AC/DC operation

- With resistive load DC-1

h⁻¹

750

1000

- For inductive load DC-3/DC-5

h⁻¹

500

500

1) Endurance see page 2/179..

2) See Selection and ordering data.

Technical specifications

Contactor	Type	3RT19 26-2C Solid-state timing relay blocks with semiconductor output	3RT19 26-2D Solid-state time-delay auxiliary switch blocks	3RT19 26-2E	3RT19 26-2F	3RT19 26-2G
General data						
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to EN 60664-1	V AC	250				
Permissible ambient temperature						
• During operation	°C	-25 ... +60				
• During storage	°C	-40 ... +80				
Degree of protection acc. to EN 60947-1, Appendix C						
• Cover		IP40				
• Terminals		IP20				
Shock resistance Half-sine acc. to IEC 60068-2-27	g/ms	15/11				
Vibration resistance according to IEC 60068-2-6	Hz/mm	10 ... 55/0.35				
EMC tests	Basic specification	IEC 61000-6-4				
Conductor connections						
• Solid	mm ²	2 x (0.5 ... 1.5), 2 x (0.75 ... 4)				
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 2.5)				
• AWG cables, solid or stranded	AWG	2 x (18 ... 14)				
• Terminal screws		M3				
• Tightening torque	Nm lb.in	0.8 ... 1.2 7 ... 10.3				
Permissible mounting positions		Any				
Control						
Operating range of excitation		0.8 ... 1.1 x U_s , 0.95 ... 1.05 times the rated frequency	0.85 ... 1.1 x U_s , 0.95 ... 1.05 times the rated frequency			
Rated power	W	1	2			
• Power consumption at 230 V AC, 50 Hz	VA	1	4			
Overvoltage protection		Varistor integrated in timing relay		--		
Recovery time	ms	50		150		
Minimum ON period	ms	35		200 (with OFF-delay)		
Setting accuracy With reference to upper limit of scale	Typ. %	±15				
Repeat accuracy	Max. %	±1				
Load side						
Rated operational currents I_e						
• Load current	A	0.3	--			
• AC-15, 230 V, 50 Hz	A	--	3			
• DC-13, 24 V	A	--	1			
• DC-13, 110 V	A	--	0.2			
• DC-13, 230 V	A	--	0.1			
Short-time loading capacity	Up to 10 ms	A	10	--		
DIAZED protection gG operational class	A	--		4		
Residual current	Max. mA	5		--		
Voltage drop With conducting output	Max. VA	3.5		--		
Mechanical endurance		Operating cycles	100 x 10 ⁶	10 x 10 ⁶		
Switching frequency for load						
• With I_e at 230 V AC	h ⁻¹	200		2500		
• With 3RT20 16 contactor at 230 V AC	h ⁻¹	2500		5000		



Function	Function chart	
	<div><div></div> Timing relay energized</div> <div><div></div> Contact closed</div> <div><div></div> Contact open</div>	
Solid-state timing relay blocks	1 NO contact (semiconductor output)	
ON-delay, two-wire design (varistor integrated)	<div>3RT19 26-2C</div> <div><div>A1/A2</div><div>Timing relay</div><div>A1/A2</div><div>Contactor</div><div>t</div><div>NSB0_0939a</div></div>	<div><div>L1/L+</div><div>A1</div><div>A2</div><div>①</div><div>A1</div><div>A2</div><div>②</div><div>A1</div><div>A2</div><div>N/L-</div><div>NSB0_0956</div></div> <div>A2 can be connected to N(L-) using either the contactor or the timing relay. --- To be connected optionally ① Timing relay block ② Contactor</div>
OFF-delay with auxiliary voltage (varistor integrated)	<div>3RT19 26-2D</div> <div><div>A1/A2</div><div>Timing relay</div><div>B1/A2</div><div>A1/A2</div><div>Contactor</div><div>$\geq 35\text{ ms}$</div><div>t</div><div>NSB0_0940a</div></div>	<div><div>L1/L+</div><div>A1</div><div>A2</div><div>①</div><div>A1</div><div>A2</div><div>②</div><div>A1</div><div>A2</div><div>N/L-</div><div>NSB0_0957</div></div> <div>A2 must only be connected to N(L-) from the timing relay. ✗ Do not connect ① Timing relay block ② Contactor</div>
Solid-state time-delay auxiliary switch blocks	1 NO + 1 NC	
ON-delay	<div>3RT19 26-2E</div> <div><div>A1/A2</div><div>-7/-8</div><div>-5/-6</div><div>t</div><div>NSB0_0936</div></div>	<div><div>S1</div><div>A1</div><div>A2</div><div>A1</div><div>A2</div><div>27</div><div>35</div><div>28</div><div>36</div><div>NSB0_01873</div></div>
OFF-delay without auxiliary voltage	<div>3RT19 26-2F</div> <div><div>A1/A2</div><div>-7/-8</div><div>-5/-6</div><div>$\geq 200\text{ ms}$</div><div>t</div><div>NSB0_0937</div></div>	<div><div>S1</div><div>A1</div><div>A2</div><div>A1</div><div>A2</div><div>27</div><div>35</div><div>28</div><div>36</div><div>NSB0_01874a</div></div>
Solid-state time-delay auxiliary switch blocks	2 NO	
Wye-delta function: 1 NO delayed, 1 NO instantaneous, dead time 50 ms (varistor integrated)	<div>3RT19 26-2G</div> <div><div>A1/A2</div><div>Y -7/-8</div><div>Δ -7/-8</div><div>t</div><div>50 ms</div><div>NSB0_0938</div></div>	<div><div>S1</div><div>A1</div><div>A2</div><div>A1</div><div>A2</div><div>27</div><div>37</div><div>28</div><div>38</div><div>NSB0_01875</div></div>



Accessories 3RT1 contactors

Contactor	Type	3RH19 24, 3TX7 090 Coupling links for mounting on contactors acc. to IEC 60947/EN 60947
General data		
Rated insulation voltage U_i (pollution degree 3)	V	300
Protective separation between coil and contacts acc. to IEC 60947-1, Appendix N	V AC	Up to 300
Permissible ambient temperature		
• During operation	°C	-25 ... +60
• During storage	°C	-40 ... +80
Degree of protection acc. to IEC 60947-1, Appendix C		
• Connections		IP20
• Enclosure		IP40
Circuit diagram	<p>① Coupling link ② Contactor</p>	
Conductor cross-sections		
• Solid	mm ²	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5)
Terminal screws		M3
Control side		
Rated control supply voltage U_s	V DC	24
Operating range	V DC	17 ... 30
Power consumption at U_s	W	0.5
Nominal current input	mA	20
Release voltage	V	≥ 4
Function display		Yellow LED
Protection circuit		Varistor
Load side		
Mechanical endurance	Operating cycles	20 x 10 ⁶
Electrical endurance at I_e	Operating cycles	1 x 10 ⁵
Switching frequency	Operating cycles h ⁻¹	5000
Make-time	ms	Approx. 7
Break-time	ms	Approx. 4
Bounce time	ms	Approx. 2
Contact material		AgSnO
Switching voltage	AC/DC V	24 ... 250
Permissible residual current of the electronics (with 0 signal)	mA	2.5

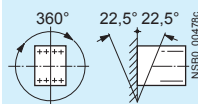


Technical specifications

Contactor relays	Type	3RH2
	Size	S00

Permissible mounting positions

The contactor relays are designed for operation on a vertical mounting surface.



Upright mounting position



Special version required

(3RH21 22-2K.40 coupling relays and contactor relays with extended operating range on request)

Positively-driven operation of contacts in contactor relays

3RH2:

Yes, in the basic unit and the auxiliary switch block as well as between the basic unit and the front-mounted auxiliary switch block (removable) acc. to:

- ZH 1/457
- IEC 60947-5-1, Appendix L

3RH22:

Yes, in the basic unit and the auxiliary switch block as well as between the basic unit and the snap-on auxiliary switch block (permanently mounted) acc. to:

- ZH 1/457
- IEC 60947-5-1, Appendix L

Note:

3RH29 11-.NF. solid-state compatible auxiliary switch blocks have no positively-driven contacts.

Explanations:

There is positively-driven operation if it is ensured that the NC and NO contacts cannot be closed at the same time.

ZH1/457

Safety Rules for Controls on Power-Operated Metalworking Presses.

IEC 60947-5-1, Appendix L

Low-Voltage Controlgear, Controls and Contact Blocks. Special requirements for positively-driven contacts

Contact reliability

Contact reliability at 17 V, 1 mA acc. to IEC 60947-5-4

Frequency of contact faults $< 10^{-8}$ i.e. < 1 fault per 100 million operating cycles

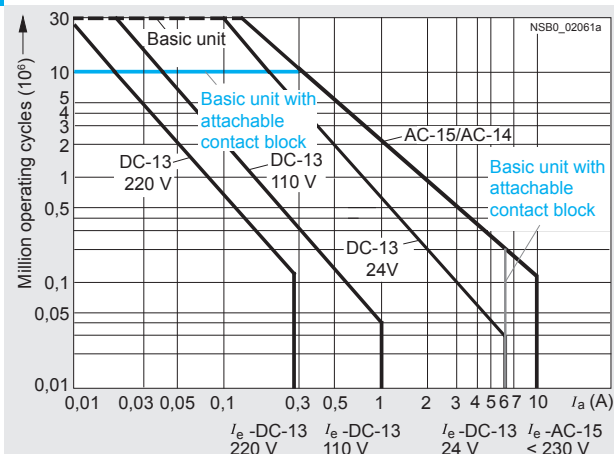
Contact endurance for AC-15/AC-14 and DC-13 utilization categories

The contact endurance is mainly dependent on the breaking current. It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system.

If magnetic circuits other than the contactor coil systems or solenoid valves are present, e.g. magnetic brakes, protective measures for the load circuits are necessary, e.g. in the form of RC elements and free-wheel diodes.

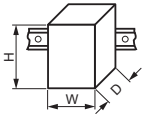



The characteristic curves apply to:

- 3RH21/3RH22 contactor relays
- 3RH24 latched contactor relays
- 3RH29 11 auxiliary switch blocks¹⁾
- Auxiliary switch blocks for snapping onto the front, max. 4-pole and for mounting onto the side in size S00



¹⁾ $I_e = 6$ A for AC-15/AC-14.



Type				
Size				
Dimensions (W x H x D) with screw terminals		mm	3RH21 S00 45 x 57.5 x 73	3RH22 S00 --
• With mounted auxiliary switch block		mm	45 x 57.5 x 116	45 x 57.5 x 116
General technical specifications				
Mechanical endurance				
• Basic units	Operating cycles		30 million	5 million
• Basic unit with snap-on auxiliary switch block	Operating cycles		10 million	
• Solid-state compatible auxiliary switch block	Operating cycles		5 million	
Rated insulation voltage U_i (pollution degree 3)	V		690	
Rated impulse withstand voltage U_{imp}	kV		6	
Protective separation between the coil and the contacts in the basic unit acc. to IEC 60947-1, Appendix N	V		400	
Permissible ambient temperature				
• During operation	°C		-25 ... +60	
• During storage	°C		-55 ... +80	
Degree of protection acc. to IEC 60947-1, Appendix C			IP20, coil assembly IP40	
Touch protection acc. to EN 50274			Finger-safe	
Shock resistance				
• Rectangular pulse	- AC operation - DC operation	g/ms g/ms	7.3/5 and 4.7/10 >10/5 and >5/10	
• Sine pulse	- AC operation - DC operation	g/ms g/ms	11.4/5 and 7.3/10 >15/5 and >8/10	
Short-circuit protection				
• Short-circuit test with fuse links of gG operational class: DIAZED, type 5SB; NEOZED, type 5SE with short-circuit current I_k = 1 kA acc. to IEC 60947-5-1	A		10	
• Test with miniature circuit breaker up to 230 V with C characteristic: Short-circuit current I_k = 400 A acc. to IEC 60947-5-1	A		6	
Conductor cross-sections				
Auxiliary conductors and coil terminals (1 or 2 conductors can be connected)			 Screw terminals	
• Solid	mm ²		2 x (0.5 ... 1.5) ¹⁾ ; 2 x (0.75 ... 2.5) ¹⁾ according to IEC 60947; max. 2 x (0.5 ... 4)	
• Finely stranded with end sleeve	mm ²		2 x (0.5 ... 1.5) ¹⁾ ; 2 x (0.75 ... 2.5) ¹⁾	
• AWG cables, solid or stranded	AWG		2 x (20 ... 16) ¹⁾ ; 2 x (18 ... 14) ¹⁾	
• Terminal screw - Tightening torque	Nm		M3 (for standard screwdriver size 2 or Pozidriv 2) 0.8 ... 1.2 (7 ... 10.3 lb.in)	
Auxiliary conductors and coil terminals (1 or 2 conductors can be connected)			 Spring-type terminals	
• Operating devices	mm		3.0 x 0.5; 3.5 x 0.5	
• Solid	mm ²		2 x (0.5 ... 4)	
• Finely stranded with end sleeve	mm ²		2 x (0.5 ... 2.5)	
• Finely stranded without end sleeve	mm ²		2 x (0.5 ... 2.5)	
• AWG cables, solid or stranded	AWG		2 x (20 ... 12)	
Auxiliary conductors for front and laterally mounted auxiliary switches				
• Operating devices	mm		3.0 x 0.5; 3.5 x 0.5	
• Solid	mm ²		2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve	mm ²		2 x (0.5 ... 1.5)	
• Finely stranded without end sleeve	mm ²		2 x (0.5 ... 2.5)	
• AWG cables, solid or stranded	AWG		2 x (20 ... 14)	
Auxiliary conductor and coil terminals			 Ring terminal lug connection	
• Terminal screw	mm		M3, Pozidriv size 2	
• Operating devices	Nm		Ø 5 ... 6	
• Tightening torque	mm		0.8 ... 1.2	
• Usable ring terminal lugs - DIN 46234 without insulation sleeve - DIN 46225 without insulation sleeve - DIN 46237 with insulation sleeve - JIS C2805 Type R without insulation sleeve - JIS C2805 Type RAV with insulation sleeve - JIS C2805 Type RAP with insulation sleeve	mm		d_2 = min. 3.2 d_3 = max. 7.5	

¹⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

Note:

Max. external diameter of the cable insulation: 3.6 mm.

Tool for opening the spring-type terminals
see [Accessories, page 2/79](#).

An insulation stop must be used for conductor cross-sections ≤ 1 mm², see [Accessories, page 2/79](#).



Contactor relays	Type	3RH2.
	Size	S00
Control circuits		
Coil operating range		
• AC operation	At 50 Hz	0.8 ... 1.1 x U_s
	At 60 Hz	0.85 ... 1.1 x U_s
• DC operation	At +50 °C	0.8 ... 1.1 x U_s
	At +60 °C	0.85 ... 1.1 x U_s
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)		
• AC operation, 50 Hz		
- Closing	VA/p.f.	37/0.8
- Closed	VA/p.f.	5.7/0.25
• AC operation, 60 Hz		
- Closing	VA/p.f.	33/0.75
- Closed	VA/p.f.	4.4/0.25
• DC operation (closing = closed)	W	4.0
Permissible residual current of the electronics (with 0 signal)		
• For AC operation ¹⁾		< 4 mA x (230 V/ U_s)
• For DC operation		< 10 mA x (24 V/ U_s)
Operating times²⁾		
Total break time = OFF-delay + Arcing time		
Values apply with coil in cold state and at operating temperature for operating range		
<u>AC operation</u>		
• Closing		
- ON-delay of NO contact	With 0.8 ... 1.1 x U_s ms	8 ... 33
	With 1.0 x U_s ms	9 ... 22
	3RH24 minimum operating time ms	≥ 35
- OFF-delay of NC contact	With 0.8 ... 1.1 x U_s ms	6 ... 25
	With 1.0 x U_s ms	6.5 ... 19
• Opening		
- OFF-delay of NO contact	With 0.8 ... 1.1 x U_s ms	4 ... 15
	With 1.0 x U_s ms	4.5 ... 15
	3RH24 minimum operating time ms	≥ 30
- ON-delay of NC contact	With 0.8 ... 1.1 x U_s ms	5 ... 15
	With 1.0 x U_s ms	5 ... 15
<u>DC operation</u>		
• Closing		
- ON-delay of NO contact	With 0.8 ... 1.1 x U_s ms	30 ... 100
	With 1.0 x U_s ms	35 ... 50
	3RH24 minimum operating time ms	≥ 100
- OFF-delay of NC contact	With 0.8 ... 1.1 x U_s ms	25 ... 90
	With 1.0 x U_s ms	30 ... 45
• Opening		
- OFF-delay of NO contact	With 0.8 ... 1.1 x U_s ms	7 ... 13
	With 1.0 x U_s ms	7 ... 12
	3RH24 minimum operating time ms	≥ 30
- ON-delay of NC contact	With 0.8 ... 1.1 x U_s ms	13 ... 19
	With 1.0 x U_s ms	13 ... 18
• Arcing time		10 ... 15
Dependence of the switching frequency z' on the operational current I' and operational voltage U' :		
$z' = z \cdot I_e/I' \cdot (U_e/U')^{1.5} \cdot 1/h$		

¹⁾ The 3RT29 16-1GA00 additional load module is recommended for higher residual currents (see page 2/74).

²⁾ The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assembly 2 to 6 times, varistor +2 to 5 ms).



Contactor relays	Type	3RH2.
	Size	S00
Load side		
AC capacity		
Rated operational currents I_e		
AC-12	A	10
AC-15/AC-14 for rated operational voltage U_s	Up to 230 V A	6
	400 V A	3
	500 V A	2
	690 V A	1
Load rating with DC		
Rated operational currents I_e		
DC-12 for rated operational voltage U_s		
• 1 conducting path	24 V A	6
	60 V A	6
	110 V A	3
	220 V A	1
	440 V A	0.3
	600 V A	0.15
• 2 conducting paths in series	24 V A	10
	60 V A	10
	110 V A	4
	220 V A	2
	440 V A	1.3
	600 V A	0.65
• 3 conducting paths in series	24 V A	10
	60 V A	10
	110 V A	10
	220 V A	3.6
	440 V A	2.5
	600 V A	1.8
DC-13 for rated operational voltage U_s		
• 1 conducting path	24 V A	6
	60 V A	2
	110 V A	1
	220 V A	0.3
	440 V A	0.14
	600 V A	0.1
• 2 conducting paths in series	24 V A	10
	60 V A	3.5
	110 V A	1.3
	220 V A	0.9
	440 V A	0.2
	600 V A	0.1
• 3 conducting paths in series	24 V A	10
	60 V A	4.7
	110 V A	3
	220 V A	1.2
	440 V A	0.5
	600 V A	0.26
Switching frequency		
Switching frequency z in operating cycles/hour		
• For rated operation	AC-12/DC-12 h^{-1}	1000
• For utilization category	AC-15/AC-14 h^{-1}	1000
	DC-13 h^{-1}	1000
• No-load switching frequency	h^{-1}	10000
Dependence of the switching frequency z' on the operational current I' and operational voltage U :		
$z' = z \cdot I_e / I' \cdot (U_e / U)^{1.5} \cdot 1/h$		
Ⓢ and Ⓢ rated data		
Basic units and auxiliary switch blocks		
• Rated control supply voltage	V AC	max. 600
• Rated voltage	V AC	600
• Switching capacity		A 600, Q 600
• Uninterrupted current at 240 V AC	A	10



Technical specifications

All technical specifications not mentioned in the table below are identical to those of the 3RH21 contactor relays (see page 5/6).

Contactor type	3RH21 ...HB40	3RH21 ...JB40	3RH21 ...KB40
Size	S00	S00	S00
Control circuits			
Coil operating range	0.7 ... 1.85 x U_s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed			
• At $U_s = 17$ V	W	1.4	
• At $U_s = 24$ V	W	2.8	
• At $U_s = 30$ V	W	4.4	
Permissible residual current of the electronics for 0 signal	< 10 mA x (24 V/ U_s)		
Overvoltage configuration of the solenoid coil	No overvoltage damping 	With diode 	With suppressor diode
Operating times			
• Closing at 17 V			
- ON-delay NO	ms	40 ... 130	
- OFF-delay NC	ms	30 ... 80	
• At 24 V			
- ON-delay NO	ms	35 ... 60	
- OFF-delay NC	ms	25 ... 40	
• At 30 V			
- ON-delay NO	ms	25 ... 50	
- OFF-delay NC	ms	15 ... 30	
• Opening at 17 ... 30 V			
- OFF-delay NO	ms	7 ... 20	7 ... 20
- ON-delay NC	ms	20 ... 30	20 ... 30
Upright mounting position	Request required		

Contactor type	3RH21 ...MB40-0KT0	3RH21 ...VB40	3RH21 ...WB40
Size	S00	S00	S00
Control circuits			
Coil operating range	0.85 ... 1.85 x U_s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed at $U_s = 24$ V	W	1.6	
Permissible residual current of the electronics for 0 signal	< 8 mA x (24 V/ U_s)		
Overvoltage configuration of the solenoid coil	Diode, varistor or RC element, attachable 	Built-in diode 	Built-in suppressor diode

Control circuits			
Operating times			
• Closing at 20.5 V			
- ON-delay NO	ms	30 ... 120	
- OFF-delay NC	ms	20 ... 110	
• At 24 V			
- ON-delay NO	ms	25 ... 90	
- OFF-delay NC	ms	15 ... 80	
• At 44 V			
- ON-delay NO	ms	15 ... 60	
- OFF-delay NC	ms	10 ... 50	
• Closing at 17 ... 30 V			
- OFF-delay NO	ms	5 ... 20	5 ... 20
- ON-delay NC	ms	10 ... 30	10 ... 30
Upright mounting position	Request required		

Terminal designations and identification numbers for auxiliary contacts

Terminal designations

The terminal designations are 2-digit, e.g. 13, 14, 21, 22:

- Tens digit: Sequence digit
 - Related terminals have the same sequence digit
- Units digit: Function digit
 - 1-2 for normally closed contacts (NC)
 - 3-4 for normally open contacts (NO)

Identification numbers

The identification number indicates the number and type of the auxiliary contacts, e.g. 40, 31, 22, 13:

- 1st digit: number of normally open contacts (NO)
- 2nd digit: number of normally closed contacts (NC)

Examples:








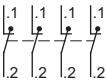


- 31 = 3 NO + 1 NC
- 40 = 4 NO

Selection guide for mountable auxiliary switch blocks for power contactors and contactor relays

The auxiliary switch blocks of the 3RH29 series for mounting on the front and side can be used for power contactors as well as for contactor relays.

The possible combinations of basic unit and mounted auxiliary switch block can be found in the tables below.

Where the columns and lines intersect (blue and green in the example) you will find the identification number for the combination of basic unit (column) and auxiliary switch block (line).









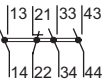
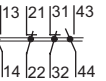



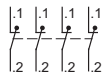


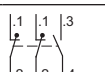
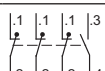


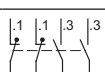
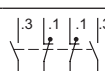
		3-pole contactors			Order No.
Auxiliary contacts	Version	3RT20 1 S00	3RT20 1 S00	3RT20 2 S0	
NO NC		10	01	11	
					
		2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	
		According to EN 50012 ¹⁾			
Auxiliary switches without NO contact					
-- 1		11	02	12	3RH29 11-..HA01
-- 2		12	03	13	3RH29 11-..HA02
-- 3		13	04	14	3RH29 11-..HA03
-- 4		14	--	--	3RH29 11-..FA04
Auxiliary switch with 1 NO contact					
1 --		20	11	21	3RH29 11-..HA10
1 1		21	12	22	3RH29 11-..HA11

1) Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

		Example 1	Example 2
Type		3RT20 motor contactor, S00 with 1 NO	3RT20 motor contactor, S0 with 1 NO + 1 NC
Sequence digit		2. 3. 4. 5.	3. 4. 5. 6.
Type		Auxiliary switch with 4 NC, 3RH29 11-..FA04	Auxiliary switch with 3 NC, 3RH29 11-..HA03
Function digit		.1 .1 .1 .1 .2 .2 .2 .2	.1 .1 .1 .2 .2 .2
Type		3RT20 motor contactor, S00 with auxiliary switch block	3RT20 motor contactor, S0 with auxiliary switch block
Terminal design.		13 21 31 41 51 14 22 32 42 52	13 21 31 41 51 14 22 32 42 52
Type		Ident. No. 14	Ident. No. 14

Additional auxiliary switch blocks



























Auxiliary contacts		3-pole contactors			4-pole contactors				Contactor relays			Order No.	
Version	NO NC	S00 3RT20 1 10	3RT20 1 01	S0 3RT20 2 11	S00 3RT23 1 --	3RT25 1 --	S0/S2 3RT23 11	3RT25 11	S00 3RH21, 3RH24 40E	3RH21, 3RH24 31E	3RH21, 3RH24 22E		
													
		2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	1. 2. 3. 4.	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8	5. 6. 7. 8	5. 6. 7. 8		
Front auxiliary switches		According to EN 50012 ¹⁾			According to EN 50012 ¹⁾				According to EN 50011 ¹⁾			Order No.	
Without NO contact													
--	1		11	02	12	01	01	12	12	41X	32X	23X	3RH29 11-.HA01
--	2		12	03	13	02	02	13	--	42E	33X	24	3RH29 11-.HA02
--	3		13	04	14	03	--	--	--	43	34	--	3RH29 11-.HA03
--	4		14	--	--	--	--	--	--	44E	--	--	3RH29 11-.FA04
With 1 NO contact													
1	--		20	11	21	10	10	21	21	50E	41E	32E	3RH29 11-.HA10
1	1		21	12	22	11	11	22	22	51X	42X	33X	3RH29 11-.HA11
1	2		22	13	23	12	12	23	--	52	43	34	3RH29 11-.HA12
1	3		23	14	24	13	--	--	--	53X	44X	--	3RH29 11-.HA13
With 2 NO contacts													
2	--		30	21	31	20	20	31	31	60E	51X	42X	3RH29 11-.HA20
2	1		31	22	32	21	21	32	32	61	52	43	3RH29 11-.HA21
2	2		32	23	33	22	22	33	--	62X	53	44X	3RH29 11-.HA22
2	2		32	23	33	22	22	33	--	62X	53	44X	3RH29 11-.FA22

¹⁾ Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.



Additional auxiliary switch blocks

Auxiliary contacts Version NO NC	3-pole contactors			4-pole contactors				Contactor relays			Order No.
	S00		S0	S00		S0/S2		S00			
	3RT20 1	3RT20 1	3RT20 2	3RT23 1	3RT25 1	3RT23	3RT25	3RH21, 3RH24			
	10	01	11	--	--	11	11	40E	31E	22E	
 											
	2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	1. 2. 3. 4.	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8.	5. 6. 7. 8.	5. 6. 7. 8.	
	According to EN 50012 ¹⁾			According to EN 50012 ¹⁾				According to EN 50011 ¹⁾			
Front auxiliary switches with 3 NO contacts											
3 -- 	40	31	41	30	30	41	41	70	61	52	3RH29 11-.HA30
3 1 	41	32	42	31	31	42	42	71X	62X	53X	3RH29 11-.HA31
Front auxiliary switches with 4 NO contacts											
4 -- 	50	41	51	40	40	51	51	80E	71X	62X	3RH29 11-.FA40
	Acc. to EN 50005			Acc. to EN 50005				Acc. to EN 50005			
Front auxiliary switches with make-before-break											
-- 1 	21	12	22	11	11	22	22	51	42	33	3RH29 11-.FB11
-- 2 	32	23	33	22	22	33	--	62	53	44	3RH29 11-.FB22
-- 3 	32	23	33	22	22	33	--	62	53	44	3RH29 11-.FC22
Front auxiliary switches with complete inscription ²⁾											
1 -- 	20	11	21	10	10	21	21	50	41	32	3RH29 11-1AA10
1 -- 	20	11	21	10	10	21	21	50	41	32	3RH29 11-1BA10
-- 1 	11	02	12	01	01	12	12	41	32	23	3RH29 11-1AA01
-- 1 	11	02	12	01	01	12	12	41	32	23	3RH29 11-1BA01
1 1 	21	12	22	11	11	22	22	51	42	33	3RH29 11-1LA11
1 1 	21	12	22	11	11	22	22	51	42	33	3RH29 11-1MA11
2 -- 	30	21	31	20	20	31	31	60	51	42	3RH29 11-1LA20
2 -- 	30	21	31	20	20	31	31	60	51	42	3RH29 11-1MA20

¹⁾ Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

²⁾ Terminals from the top or bottom.

Additional auxiliary switch blocks

Auxiliary contacts Version NO NC	3-pole contactors			4-pole contactors				Contactor relays			Order No.
	S00 3RT20 1 10	3RT20 1 01	S0 3RT20 2 11	S00 3RT23 1 --	3RT25 1 --	S0/S2 3RT23 11	3RT25 11	S00 3RH21, 3RH24 40E	31E	22E	
	2. 3. 4. 5.	5. 6. 7. 8.	3. 4. 5. 6.	1. 2. 3. 4.	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8.	5. 6. 7. 8.	5. 6. 7. 8.	
	Acc. to EN 50005			Acc. to EN 50005				According to EN 50011 ¹⁾			

Front auxiliary switches with complete inscription (for contactor relays)

4	--		53 63 73 83	--	--	--	--	80E	--	--	3RH29 11-GA40
3	1		53 61 73 83	--	--	--	--	71E	--	--	3RH29 11-GA31
2	2		53 61 71 83	--	--	--	--	62E	--	--	3RH29 11-GA22
1	3		53 61 71 81	--	--	--	--	53E	--	--	3RH29 11-GA13
--	4		51 61 71 81	--	--	--	--	44E	--	--	3RH29 11-GA04

Front auxiliary switches with complete inscription, special version

4	--		53 63 73 83	50	41	51	40	40	51	51	80E	71X	62X	3RH29 11-XA40-0MA0
3	1		53 61 73 83	41	32	42	31	31	42	42	71E	62X	53	3RH29 11-XA31-0MA0
2	2		53 61 71 83	32	23	33	22	22	33	--	62E	53	44X	3RH29 11-XA22-0MA0
--	4		51 61 71 81	14	--	--	--	--	--	--	44E	--	--	3RH29 11-XA04-0MA0








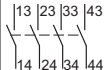



















Front auxiliary switches, Solid-state compatible

--	2		.1 .1 .2 .2	12	03	13	02	02	13	--	42	33	24	3RH29 11-NF02
1	1		.3 .1 .4 .2	21	12	22	11	11	22	22	51	42	33	3RH29 11-NF11
2	--		.3 .3 .4 .4	30	21	31	20	20	31	31	60	51	42	3RH29 11-NF20

¹⁾ Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.
































Additional auxillary switch blocks

Auxiliary contacts Version		3-pole contactors S00			4-pole contactors S00				Contactors relays S00			Order No.	
NO	NC	3RT20 1 10	3RT20 1 01	S0 3RT20 2 11	3RT23 1 --	3RT25 1 --	S0/S2 3RT23 11	3RT25 11	3RH21, 3RH24 40E		31E		22E
													
Left	Right	2. 3. 4. 5. 5. 6. 7. 8. 3. 4. 5. 6. According to EN 50012 ¹⁾			1. 2. 3. 4. 1. 2. 3. 4. 3. 4. 5. 6. 3. 4. 5. 6. According to EN 50012 ¹⁾				5. 6. 7. 8. 5. 6. 7. 8. 5. 6. 7. 8. According to EN 50011 ¹⁾				
Lateral auxiliary switches for size S00													
--	2		12	--	--	02	02	--	--	--	--	3RH29 11-.DA02	
--	2		14	--	--	--	--	--	--	--	--	3RH29 11-.DA02	
1	1		21	--	--	11	11	--	--	--	--	3RH29 11-.DA11	
1	1		32	--	--	22	22	--	--	--	--	3RH29 11-.DA11	
2	--		30	--	--	20	20	--	--	--	--	3RH29 11-.DA20	
2	--		50	--	--	40	40	--	--	--	--	3RH29 11-.DA20	
2	--		41	--	--	31	31	--	--	--	--	3RH29 11-.DA20 + 3RH29 11-.DA11	
1	1		32	--	--	22	22	--	--	--	--	3RH29 11-.DA20 + 3RH29 11-.DA02	
2	--		23	--	--	13	--	--	--	--	--	3RH29 11-.DA11 + 3RH29 11-.DA02	
1	1		23	--	--	13	--	--	--	--	--	3RH29 11-.DA11 + 3RH29 11-.DA02	
--	2		23	--	--	13	--	--	--	--	--	3RH29 11-.DA11 + 3RH29 11-.DA02	
Lateral auxiliary switches for size S0													
--	2		12	03	13	02	02	13	--	--	--	3RH29 21-.DA02	
--	2		14	--	--	--	--	--	--	--	--	3RH29 21-.DA02	
1	1		21	12	22	11	11	22	22	--	--	3RH29 21-.DA11	
1	1		32	23	33	22	22	33	--	--	--	3RH29 21-.DA11	
2	--		30	21	31	20	20	31	31	--	--	3RH29 21-.DA20	
2	--		50	41	51	40	40	51	51	--	--	3RH29 21-.DA20	

¹⁾ Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

Additional auxiliary switch blocks

Auxiliary contacts Version NO NC		3-pole contactors			4-pole contactors				Contactor relays			Order No.
		S00 3RT20 1 10	3RT20 1 01	S0 3RT20 2 11	S00 3RT23 1 --	3RT25 1 --	S0/S2 3RT23 11	3RT25 11	S00 3RH21, 3RH24 40E	31E	22E	
 									  	  	  	
Left	Right	2. 3. 4. 5. According to EN 50012 ¹⁾	5. 6. 7. 8. 3. 4. 5. 6.	3. 4. 5. 6.	1. 2. 3. 4. According to EN 50012 ¹⁾	1. 2. 3. 4.	3. 4. 5. 6.	3. 4. 5. 6.	5. 6. 7. 8. According to EN 50011 ¹⁾	5. 6. 7. 8.	5. 6. 7. 8.	
Lateral auxiliary switches for size S0, S00												
2 --		41	32	42	31	31	42	42	--	--	--	
1 1												
2 --												
2 --		32	23	33	22	22	33	--	--	--	--	3RH29 21-.DA20 + 3RH29 21-.DA02
-- 2												
2 --												
1 1		23	14	24	13	--	--	--	--	--	--	3RH29 21-.DA11 + 3RH29 21-.DA02
-- 2												
2 --												
Lateral auxiliary switches for contactor relays												
-- 2		--	--	--	--	--	--	--	42Z	33X	24	3RH29 21-.DA02
1 1		--	--	--	--	--	--	--	51X	42X	33X	
2 --		--	--	--	--	--	--	--	60Z	51X	42X	
Lateral auxiliary switches, Solid-state compatible for size S00												
1 1		21	--	--	11	11	--	--	--	--	--	3RH29 11-2DE11
1 1												
1 1												
Lateral auxiliary switches, Solid-state compatible for size S0, S00												
1 1		21	12	22	11	11	22	22	--	--	--	3RH29 21-2DE11
1 1												
1 1												
Lateral auxiliary switches, Solid-state compatible for contactor relays												
1 1		--	--	--	--	--	--	--	51X	42X	33X	3RH29 21-.DE11
1 1												
1 1												

¹⁾ Combinations according to EN 50012, EN 50011 and IEC 60947-5-1 are in bold print. All combinations comply with EN 50005.

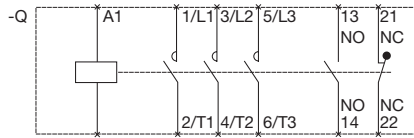


Internal circuit diagrams (applicable to screw, spring and ring lug connection)

Sizes S3 to S12

Terminal designations according to EN 50 012

3RT10 4 to 3RT10 7, 3RT12, 3RT14 contactors

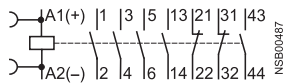


3RT10 4 to 3RT10 7, 3RT14 contactors

With 3RH19 21- . HA22 4-pole auxiliary contact block, mountable on the front

2 NO + 2 NC

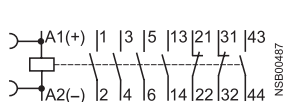
Ident. no. 22E



3RT1. 5, 3RT1. 6, 3RT1. 7 contactors (sizes S6, S10, S12)

With 3RH19 21-1DA11 2-pole auxiliary switch blocks, laterally mountable

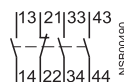
2 NO + 2 NC



3RH19 21- . HA../XA..4-pole auxiliary switch blocks, for snapping onto the front²⁾

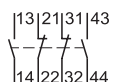
3 NO + 1 NC

Ident. no. 31



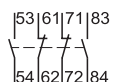
2 NO + 2 NC

22



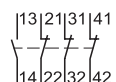
2 NO + 2 NC

22



1 NO + 3 NC

13



3RH19 21- . DA11, 3RH19 21-2DE11 first laterally mountable auxiliary switch block (solid-state compatible)

1 NO + 1 NC

left



1 NO + 1 NC

right



3RH19 21- . JA11, 3RH19 21-2JE11 second laterally mountable auxiliary switch block (solid-state compatible)

(only for sizes S3 to S12)

1 NO + 1 NC

left



1 NO + 1 NC

right

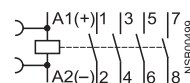


Contactors with 4 main contacts, sizes S3

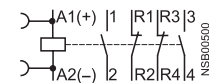
Terminal designations acc. to EN 50 005

3RT13/23 and 3RT15/25 contactors

4 NO



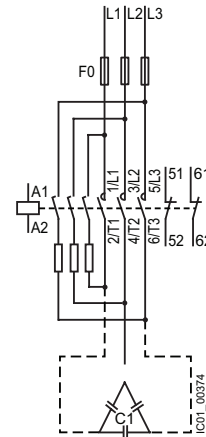
2 NO + 2 NC



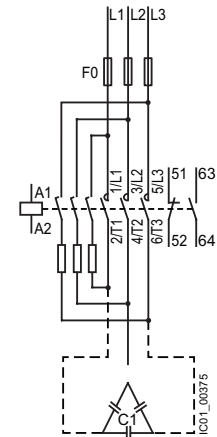
(3RH19 21 auxiliary switch blocks acc. to EN 50 005 can be snapped on)

3RT26 capacitor contactors

Size S00



Sizes S0 and S2



Surge suppressor (plug-in direction coded; exception: marked +/- for 3RT19 16-1T... diode assembly) for sizes S2 to S3

Diode



Diode assembly



Varistor



RC element



Diode with LED



Varistor with LED



1) 3RH29 auxiliaries are intended to be used only with 3RT2 or 3RH2 base devices.

3RH19 auxiliaries are intended to be used only with 3RT1 or 3RH1 base devices.

2) Not for 3RT12. vacuum contactors

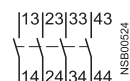
Internal circuit diagrams (applicable to screw connection and Spring-type terminal connection)

Accessories for size S3¹⁾ to S12 contactors Terminal designations acc. to EN 50 005

3RH19 21-.F..., 4-pole,
for snapping onto the front ¹⁾

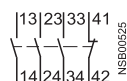
4 NO

Ident. no. 40



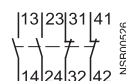
3 NO + 1 NC

31



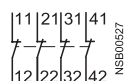
2 NO + 2 NC

22



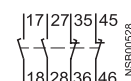
4 NC

04



2 NO + 2 NC

22 U



make-before-break

3RH19 21-.CA.. auxiliary switch blocks, single-pole,
for snapping onto the front ²⁾

1 NO



1 NC



(terminal designations according to EN 50 005 or
EN 50 012)

3RH19 21-1CD.. auxiliary switch blocks, single-pole,
with make-before-break contacts, for snapping onto the front ¹⁾

1 NO



1 NC



Accessories for size S0 to S12 contactors Terminal designations acc. to EN 50 005

3RH19 21-1LA.. and 3RH19 21-1MA.. auxiliary switch block, 2-pole,
for snapping onto the front ¹⁾
cable entry from above or below

2 NO



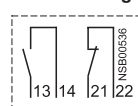
1 NO + 1 NC



2 NC



Internal wiring

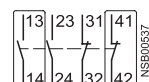


Example: 1 NO + 1 NC,
cable entry from below

3RH19 21-.FE22 solid-state compatible auxiliary switch block, 4-pole,
for snapping onto the front ¹⁾

2 NO + 2 NC

Ident. no. 22



3RH19 21-.EA.. first laterally mountable auxiliary switch blocks (left)

2 NO



1 NO + 1 NC



2 NC



3RH19 21-.EA.. first laterally mountable auxiliary switch blocks (right)

2 NO



1 NO + 1 NC



2 NC



3RH19 21-.KA.. second laterally mountable auxiliary switch blocks (left) (only for sizes S3 to S12)

2 NO



1 NO + 1 NC



2 NC



3RH19 21-.KA.. second laterally mountable auxiliary switch blocks (right) (only for sizes S3 to S12)

2 NO



1 NO + 1 NC



2 NC



¹⁾ RH29 auxiliaries are intended to be used only with 3RT2 or 3RH2 base devices.
3RH19 auxiliaries are intended to be used only with 3RT1 or 3RH1 base devices.

²⁾ Not for 3RT12. vacuum contactors

Contactors and Contactor Assemblies

3RT Contactors and 3RH2 Control Relays

Accessories
for size S00 to S3

• Revised •
09/22/15

SIRIUS



Circuit diagrams

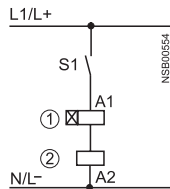
Accessories for size S3 contactors and control relays

Solid-state time-delay blocks

(see configuring aid on page 2/38)

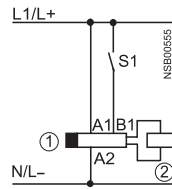
3RT19 16-2C...

ON-delay
Size S00



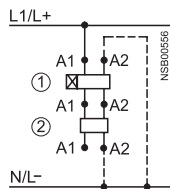
3RT19 16-2D...

OFF-delay (with auxiliary voltage)
Size S00



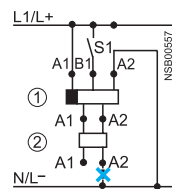
3RT19 26-2C...

ON-delay
Sizes S0 to S3



3RT19 26-2D...

OFF-delay (with auxiliary voltage)
Sizes S0 to S3

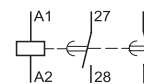


A2 can be connected to N(L-) via either the contactor or the time-delay relay.
--- optional connection

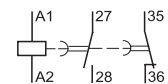
Sizes S2 to S12

3RT19 16-2E.../2F.../2G... solid-state, time-delay auxiliary switch blocks

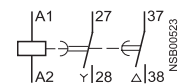
1 NO + 1 NC
ON-delay



1 NO + 1 NC
OFF-delay



2 NO
WYE-delta function



(Integrated varistors not shown)

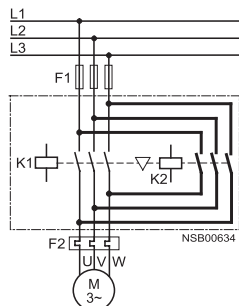
Designation	Circuit diagram
3RA2811-.CW10 ON-delay	
3RA2812-.DW10 OFF-delay with auxiliary voltage	
3RA2813-.AW10 ON-delay, 1 CO contact	
3RA2813-.FW10 ON-delay, 1 NC contact/ 1 NO contact	

Designation	Circuit diagram
3RA2814-.AW10 OFF-delay, 1 CO contact	
3RA2814-.FW10 OFF-delay with auxiliary voltage, 1 NC contact/ 1 CO contact	
3RA2815-.AW10 OFF-delay without auxiliary voltage, 1 CO contact	
3RA2815-.FW10 OFF-delay without auxiliary voltage, 1 NC contact/ 1 NO contact	

3RT29 accessories are intended to be used only with 3RT2 or 3RH2 base devices.
3RT19 auxiliaries are intended to be used only with 3RT1 or 3RH1 base devices.

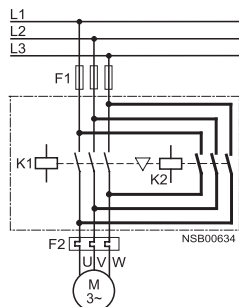
Circuit diagrams

Size S00 to S0 Main circuit



The 3RA2913-2AA (S00) and 3RA2913-2AA (S0) installation kit contains wiring connectors for connecting the main conducting paths, the mechanical interlock and two connecting clips for the contactors.

Sizes S2 to S3 Main circuit

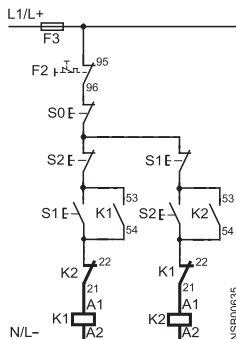


The 3RA19 24-2A installation kits contain, among other things, the wiring connectors on the top and bottom for connecting the main conducting paths.

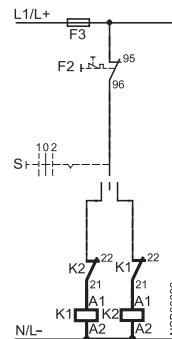
Control circuit (sizes S00 and S0)

(terminal designations of contactors according to EN 50 012)

for momentary-contact operation



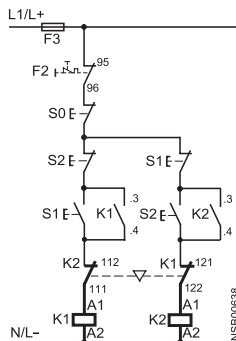
for maintained-contact operation



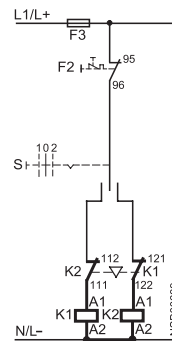
Control circuit

(terminal designations of contactors according to EN 50 005)

for momentary-contact operation



for maintained-contact operation



The 3RA19 24-2B mechanical interlock contains one NC contact for the NC contact interlock for each contactor

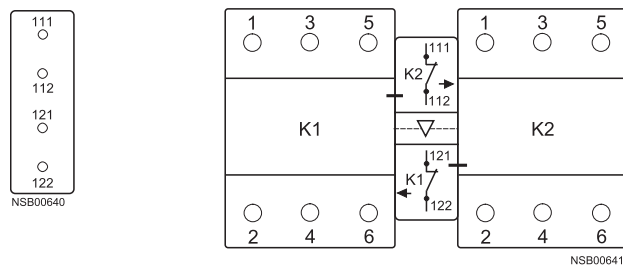
Position of terminals

Sizes S2 to S3

Terminal designations according to EN 50 005

3RA19 24-2B mechanical interlock (laterally mountable), integrated in reversing contactor assemblies (reversing starters), contains one NC contact for the electrical interlock for each contactor

2 NC



S0 "OFF" button
S1 "Clockwise ON" button
S2 "Counterclockwise ON" button
S "CW-OFF-CCW" button

K1 Clockwise contactor
K2 Counterclockwise contactor

F1 Fuses for main circuit
F3 Fuses for control circuit
F2 Overload relay

Contactors and Contactor Assemblies

3RA Contactor Assemblies

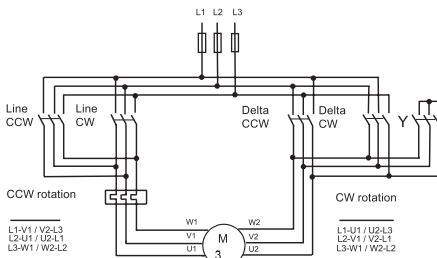
Circuit Diagrams for WYE-delta switching

SIRIUS

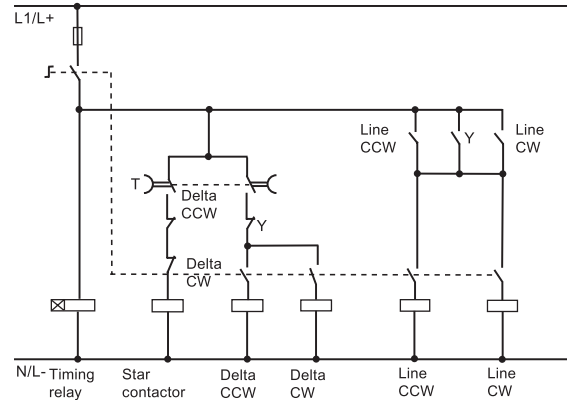


Circuit diagrams

Size S00 / S0 Main circuit

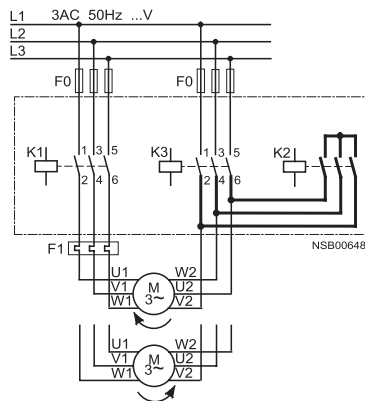


Control circuits with 3RA2816-0EW20 function module (set of three) snapped onto the front



Sizes S2 to S3 Main circuit

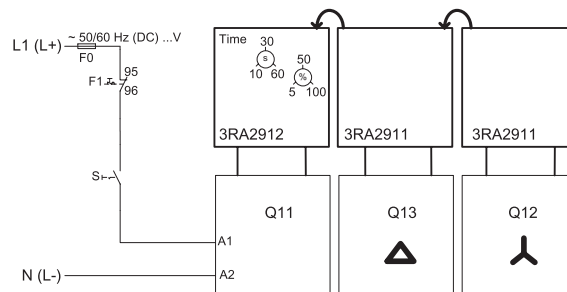
Sizes S2 and S3



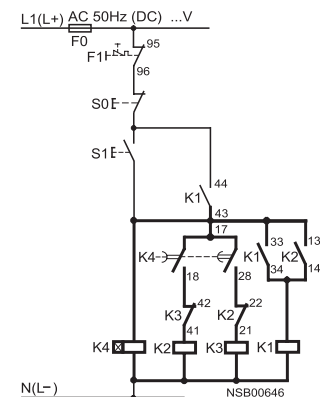
S0 "OFF" button
S1 "ON" button
S Maintained-contact switch

K1 Line contactor
K2 Star contactor
K3 Delta contactor
K4 Solid-state, time-delay auxiliary switch
block or time-delay relay
F0 Fuses
F1 Overload relay

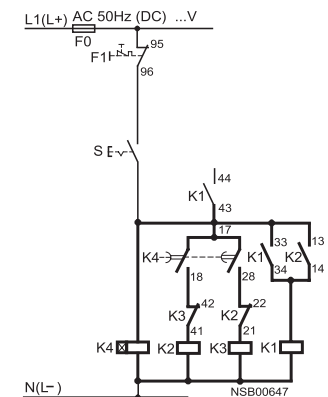
3RA2816-0EW20



Control circuits with 3RP15 7. time-delay relay, laterally mounted (typical circuits) for momentary-contact operation



for maintained-contact operation



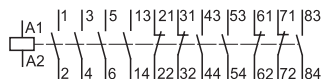
Contact element 17/18 is only closed on the star step; the contact element is open on the delta step and when de-energized.



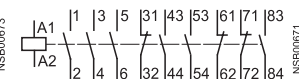
Internal circuit diagrams

3TF68 44 and 3TF69 44 contactors**4 NO + 4 NC**

AC operation
max. complement of auxiliary
switches

**3TF68 33 and 3TF69 33 contactors****3 NO + 3 NC**

DC operation
max. complement of auxiliary
switches

**Auxiliary switch blocks
3TY7 681-1G**

for coil reconnection,
3TF68 and 3TF69,
DC economy circuit

**Auxiliary switch blocks
3TY7 561-1AA00**

first auxiliary switch block
left or right
mounted on left mounted on right

**Auxiliary switch blocks
3TY7 561-1KA00**

second auxiliary switch block
left or right
mounted on left mounted on right

**Auxiliary switch blocks
3TY7 561-1EA00**

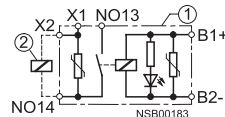
with make-before-break contacts
mounted on left mounted on right

**Auxiliary switch blocks
3TY7 561-1.**

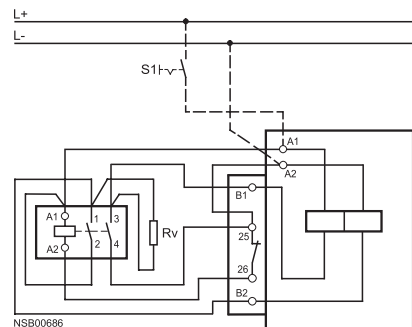
solid-state compatible aux. switch block
mounted on left mounted on right

**Interface for control by PLC
3TX7 090-0D**

with surge suppression



Circuit diagrams for DC economy circuit · maintained-contact operation

3TF68 33 and 3TF69 33 contactors

Terminal designations according to EN 50 012.



Terminal diagrams

DC operation

L+ is to be connected to coil terminal A1.

3RH21 coupling relays for auxiliary circuits, size S00

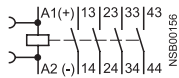
Terminal designations according to EN 50 011

(it is not possible to snap on an auxiliary switch block)

Surge suppressor can be mounted

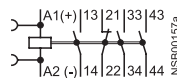
4 NO

Ident no.: 40E



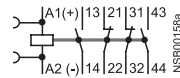
3 NO + 1 NC

31E



2 NO + 2 NC

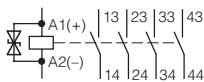
22E



Suppressor Diode integrate

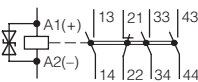
4 NO

Ident no.: 40E



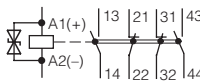
3 NO + 1 NC

31E



2 NO + 2 NC

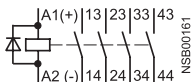
22E



Diode integrated

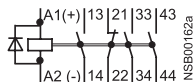
4 NO

Ident no.: 40E



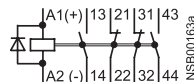
3 NO + 1 NC

31E



2 NO + 2 NC

22E



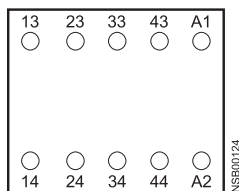
Position of terminals

Size S00

3RH21 coupling relays

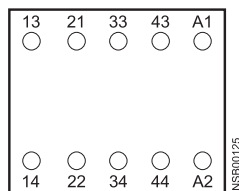
4 NO

Ident no.: 40E



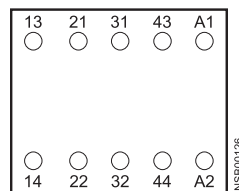
3 NO + 1 NC

31E



2 NO + 2 NC

22E

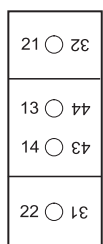


3RH19 21-..DA11 first laterally mountable auxiliary switch block¹⁾

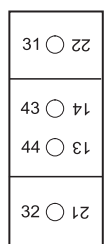
mountable on left or right

1 NO + 1 NC

left



right

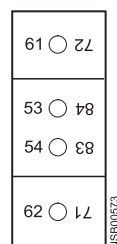


3RH19 21-..JA11 second laterally mountable auxiliary switch block¹⁾

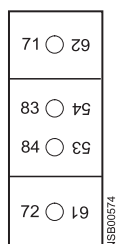
mountable on left or right (only for sizes S3 to S12)

1 NO + 1 NC

left



right



¹⁾ Note the location digit.

Can only be used if no 4-pole auxiliary switch block is snapped onto the front.

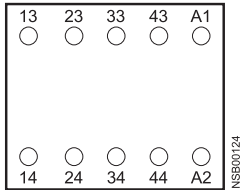


Terminal designations according to EN 50 011

3RH21 control relays

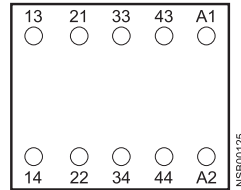
4 NO

Ident no.: 40E



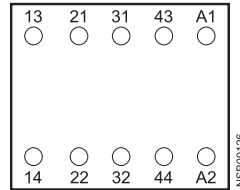
3 NO + 1 NC

31E



2 NO + 2 NC

22E

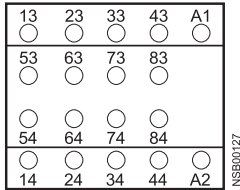


3RH21 40 control relays

with 3RH19 11-1GA.. auxiliary switch blocks snapped onto the front

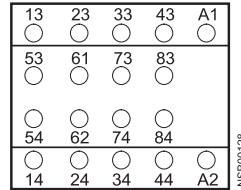
8 NO

Ident no.: 80E



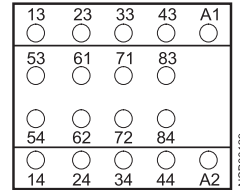
7 NO + 1 NC

71E



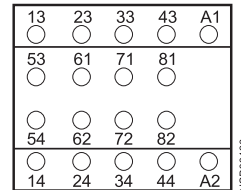
6 NO + 2 NC

62E



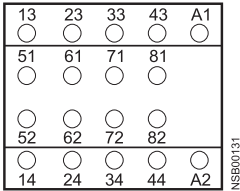
5 NO + 3 NC

53E



4 NO + 4 NC

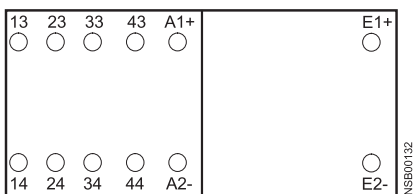
Ident no.: 44E



3RH24 latched control relays

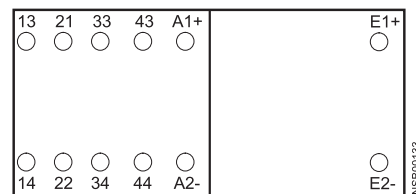
4 NO

Ident no.: 40E



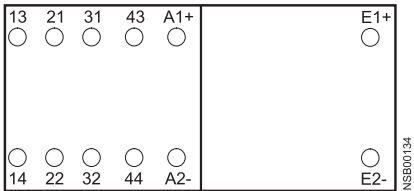
3 NO + 1 NC

31E



2 NO + 2 NC

Ident no.: 22E



Contactors and Contactor Assemblies

3RT Contactors and 3RH Control Relays

3RT1/2 contactors and accessories

• Revised •
10/22/15



Position of terminals (applicable to screw connection and Cage Clamp connection)

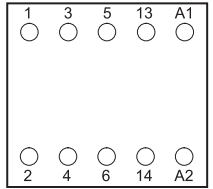
Size S00

Terminal designations according to EN 50 012

3RT20 1 contactors, 3RT20 1 coupling relays,

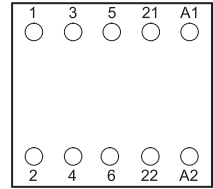
1 NO

Ident. no. 10E



1 NC

01

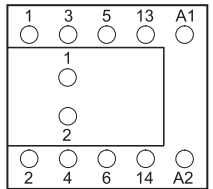


3RT20 1 contactors (with 1 NO)

with auxiliary switch blocks snapped onto the front
3RH19 11-. H...

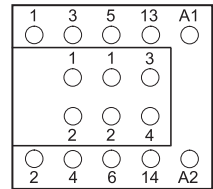
1 NO + 1 NC

Ident. no.: 11



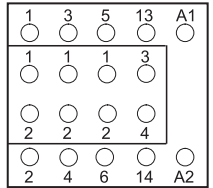
2 NO + 2 NC

22



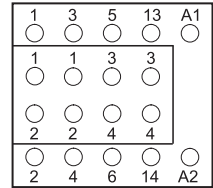
2 NO + 3 NC

Ident. no.: 23



3 NO + 2 NC

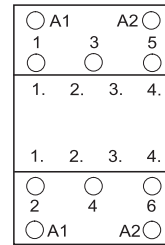
32



Sizes S3 to S12

Terminal designations according to EN 50 012

3RT 20 3,
3RT10 4, 3RT14 46 contactors,

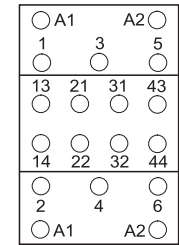


3RT 20 3, 3RT 10 4
contactors

3RH19 21-. HA22
4-pole auxiliary switch block
snapped onto the front

2 NO + 2 NC

Ident. no. 22 E

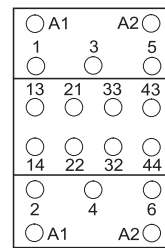


3RT20 3, 3RT10 4
contactors

with 4-pole auxiliary switch block
for snapping onto the front
3RH19 21-. HA31

3 NO + 1 NC

Ident. no. 31 E

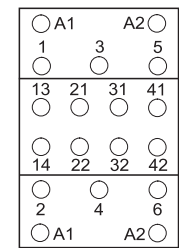


3RT20 3, 3RT10 4
contactors

with 4-pole auxiliary switch block
for snapping onto the front
3RH19 21-. HA13

1 NO + 3 NC

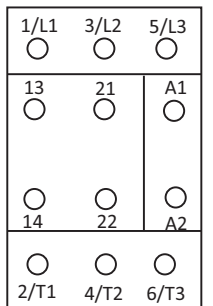
13 E



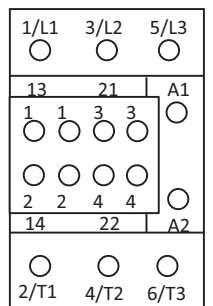
Size S0

Terminal designations according to EN 50 012

3RT20 2 Contactors with 1NO + 1NC
3RT20 2 Coupling Relays



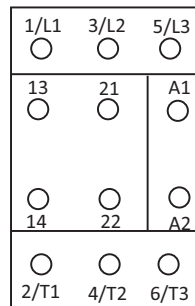
3RT20 2 Contactors
with 3NO + 3NC



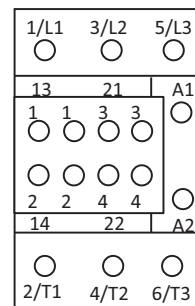
Size S2

Terminal designations according to EN 50 012

3RT20 3 Contactors with 1NO + 1NC
3RT20 3 Coupling Relays



3RT20 3 Contactors
with 3NO + 3NC



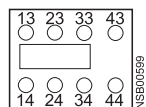
Position of terminals (applicable to screw connection and Spring-type connection)

Accessories for size S3 to S12 contactors Terminal designations acc. to EN 50 005

3RH19 21- . F... auxiliary switch blocks, 4-pole,
for snapping onto the front

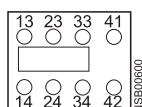
4 NO

Ident. no. 40



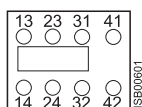
3 NO + 1 NC

31



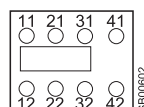
2 NO + 2 NC

22



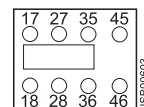
4 NC

04



2 NO + 2 NC

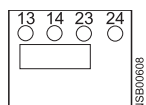
22 U



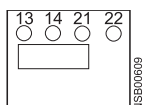
make-before-break

3RH19 21-1LA.. auxiliary switch blocks, 2-pole,
for snapping onto the front, cable entry from above

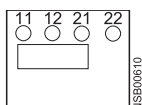
2 NO



1 NO + 1 NC

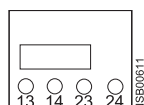


2 NC

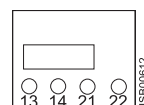


3RH19 21-1MA.. auxiliary switch blocks, 2-pole,
for snapping onto the front, cable entry from below

2 NO



1 NO + 1 NC



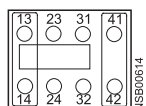
2 NC



3RH19 21- . FE22 solid-state compatible auxiliary switch block, 4-pole,
for snapping onto the front

2 NO + 2 NC

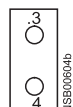
Ident. no. 22



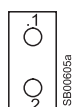
Terminal designations according to EN 50 005 or EN 50 012

3RH19 21- . CA.. auxiliary switch blocks, single-pole,
for snapping onto the front

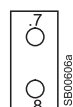
1 NO



1 NC



1 NO



with extended
contact-making

1 NC



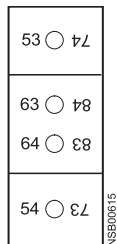
with extended
contact-making

Position of terminals

Accessories for size S2 to S12 contactors
Terminal designations acc. to EN 50 005

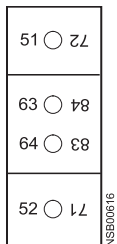
3RH19 21- . EA.. first laterally mountable auxiliary switch blocks (left)

2 NO



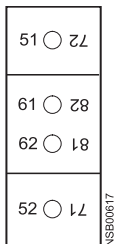
NSB00615

1 NO + 1 NC



NSB00616

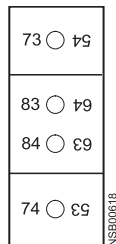
2 NC



NSB00617

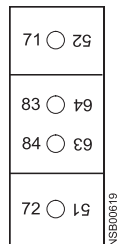
3RH19 21- . EA.. first laterally mountable auxiliary switch blocks (right)

2 NO



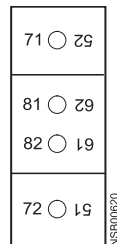
NSB00618

1 NO + 1 NC



NSB00619

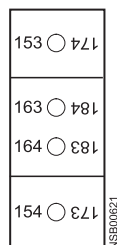
2 NC



NSB00620

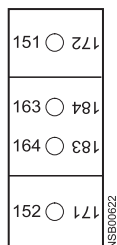
3RH19 21- . KA.. second laterally mountable auxiliary switch blocks (left)
(only for sizes S3 to S12; can only be used if no auxiliary switches are snapped onto the front)

2 NO



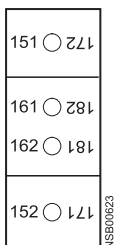
NSB00621

1 NO + 1 NC



NSB00622

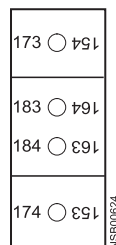
2 NC



NSB00623

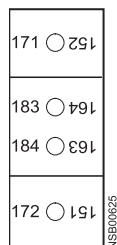
3RH19 21- . KA.. second laterally mountable auxiliary switch blocks (right)
(only for sizes S3 to S12; can only be used if no auxiliary switches are snapped onto the front)

2 NO



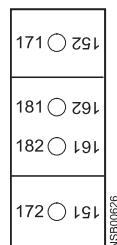
NSB00624

1 NO + 1 NC



NSB00625

2 NC

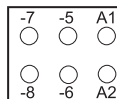


NSB00626

Accessories for size S3 to S12 contactors
Terminal designations acc. to DIN 46 199 Part 5

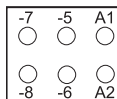
3RT19 26-2E.../2F.../2G... solid-state, time-delay auxiliary switch blocks

1 NO + 1 NC
ON-delay



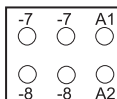
NSB00627

1 NO + 1 NC
OFF-delay



NSB00627

2 NO
Star-delta function

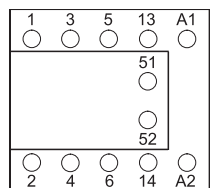


NSB00629

3RT26 capacitor contactors

Size S00

with 4-pole auxiliary switch block mounted on the front

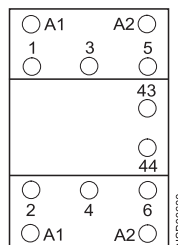


NSB0_01383

The auxiliary switch block comprises 3 leading contacts (not shown) and one unassigned NO contact.

Sizes S2 and S3

with 4-pole auxiliary switch block mounted on the front



NSB00630

The auxiliary switch block comprises 3 leading contacts (not shown) and one unassigned NO contact.



Position of terminals (applicable to screw connection and Spring-type terminal connection)

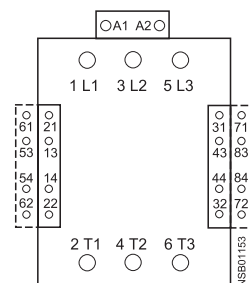
Sizes S6 to S12

3RT1.5, 3RT1.6, 3RT1.7 contactors

- with conventional op. mechanism
(3RT1...-A...)

with laterally mountable auxiliary switch blocks 3RH19 21-1DA11 (for 2 NO + 2 NC, incl. in contactor) 3RH19 21-1JA11 (expandable to 4 NO + 4 NC)

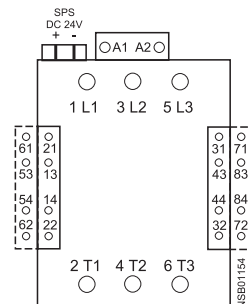
2 NO + 2 NC or 4 NO + 4 NC



- with solid-state op. mechanism
(3RT1...-N...)

with laterally mountable auxiliary switch blocks 3RH19 21-1DA11 (for 2 NO + 2 NC, incl. in contactor) 3RH19 21-1JA11 (expandable to 4 NO + 4 NC)

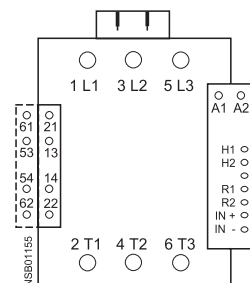
2 NO + 2 NC or 4 NO + 4 NC



- with solid-state op. mechanism
(3RT1...-P...)

with laterally mountable auxiliary switch blocks 3RH19 21-1DA11 (for 1 NO + 1 NC, incl. in contactor) 3RH19 21-1JA11 (expandable to 2 NO + 2 NC)

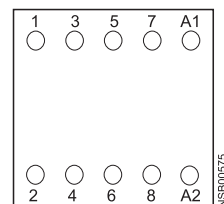
1 NO + 1 NC or 2 NO + 2 NC



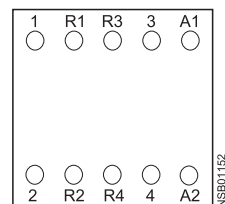
Contactors with 4 main contacts, size S00
Terminal designations acc. to EN 50 005

3RT23 and 3RT25 contactors

4 NO



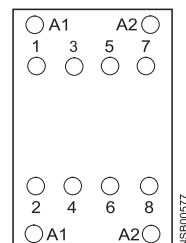
2 NO + 2 NC



Contactors with 4 main contacts, sizes S2 to S3
Terminal designations acc. to EN 50 005

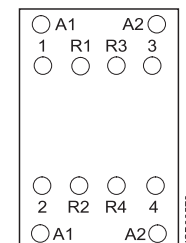
3RT13 and 3RT15 contactors

4 NO



Size S0 with integrated 1NO + 1NC aux (13/14 + 21/22) and only one set of A1+A2 on front

2 NO + 2 NC





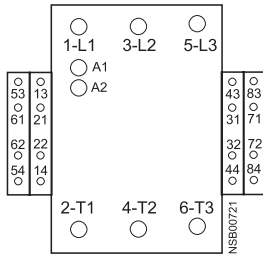
3TF68 and 3TF69 vacuum contactors, 3-pole

Position of terminals

AC operation

3TF68 and 3TF69 contactors

4 NO + 4 NC

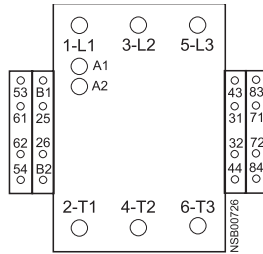


DC operation

3TF68 and 3TF69 contactors

3 NO + 3 NC

max. complement of auxiliary switches



Solid-state compatible auxiliary switch blocks

3TY7 561-1 . for lateral mounting onto
size 6 to 14 contactors

mounted
on left



mounted
on right

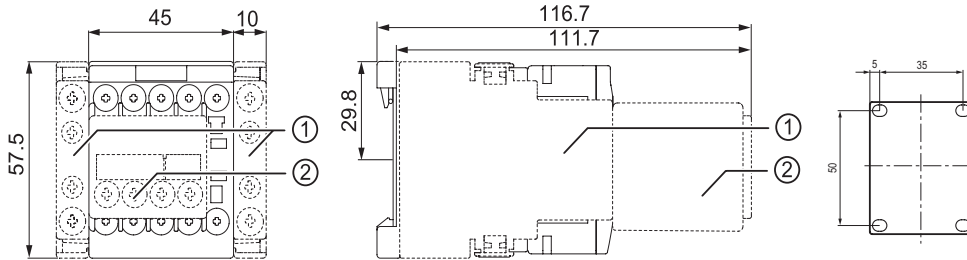




Dimension drawings

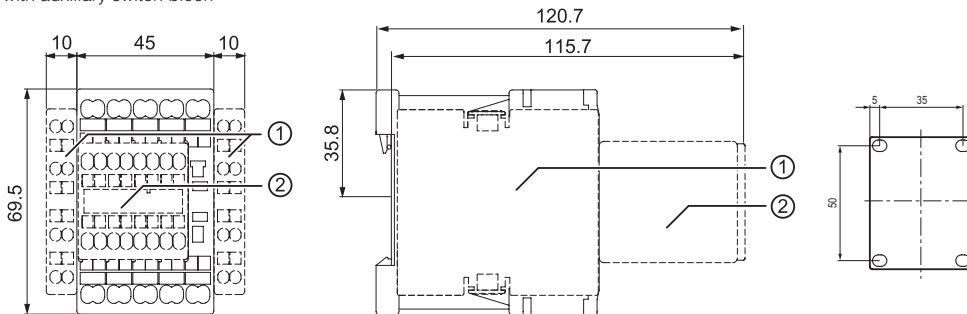
3RT2.1.-1 contactor and 3RH21.-1 contactor relays
Size S00 and NEMA Size 0, screw connection
with surge suppressor and auxiliary switch block

Lateral clearance from
earthed parts = 6 mm



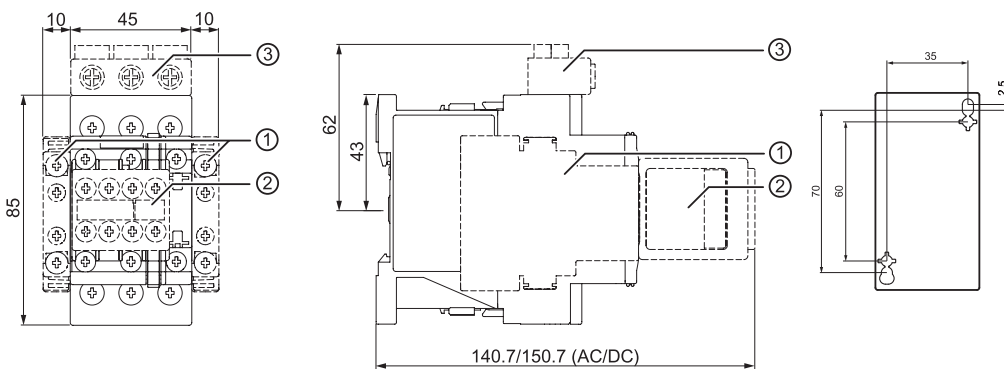
- 1) Laterally mountable auxiliary switch block 3RH2911-1DA.. / -1DE.. / -1EE..
- 2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..

3RT2.1.-2 contactor and 3RH21.-2 contactor relay
Size S00, Spring-type terminal connection
with auxiliary switch block



- 1) Laterally mountable auxiliary switch block 3RH2911-2DA.. / -2DE.. / -2EE..
- 2) Auxiliary switch block for mounting on the front 3RH2911-2FA.. / -2GA.. / -2HA.. / -2NF..

3RT2.2.-1 contactors Size S0 and NEMA Size 1,
(screw-type connection system) with auxiliary switch blocks
mounted and other accessories



- 1) Laterally mountable auxiliary switch block 3RH2921-1DA.. / -1DE..
- 2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..
- 3) 3-phase infeed terminal 3RV2925-5AB

For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

3RT10/20 contactors, 3-pole

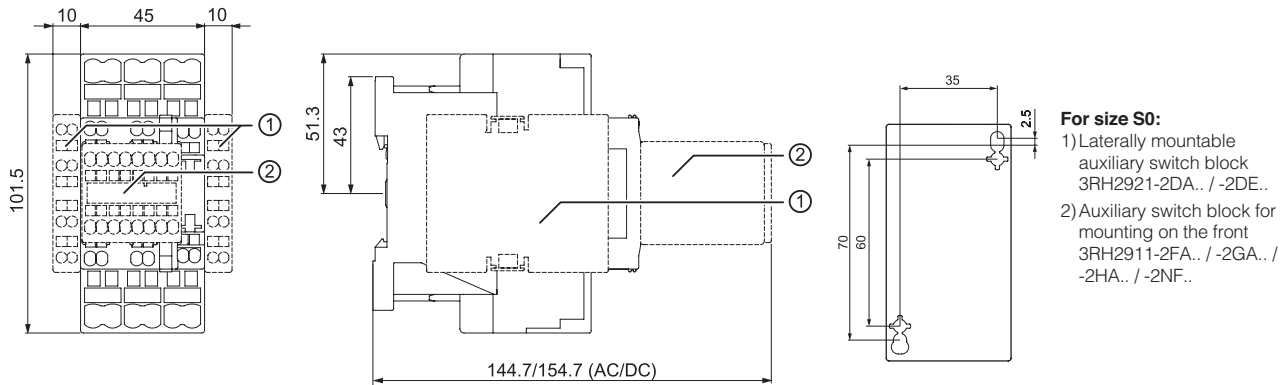
• Revised •
09/22/15



Dimension drawings

3RT2.2.-2 and 3RT202.-.....0LA2 contactors

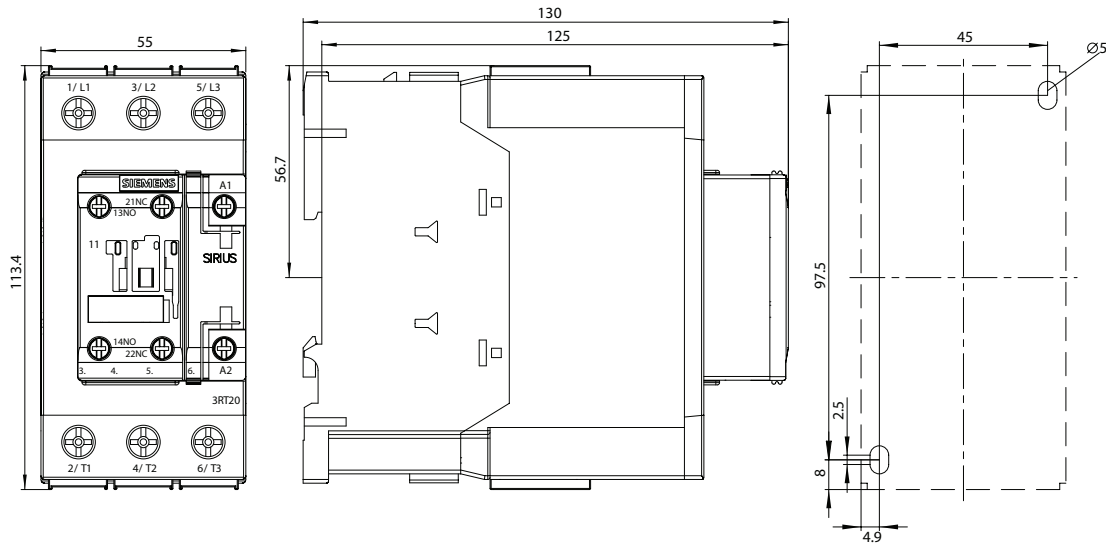
Size S0 (spring-loaded connection) with auxiliary switch blocks mounted



3RT20 3 contactors

Size S2 and NEMA Size 2, screw connection

with surge suppressor, auxiliary switch blocks and mounted overload relay



For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

For size S2:

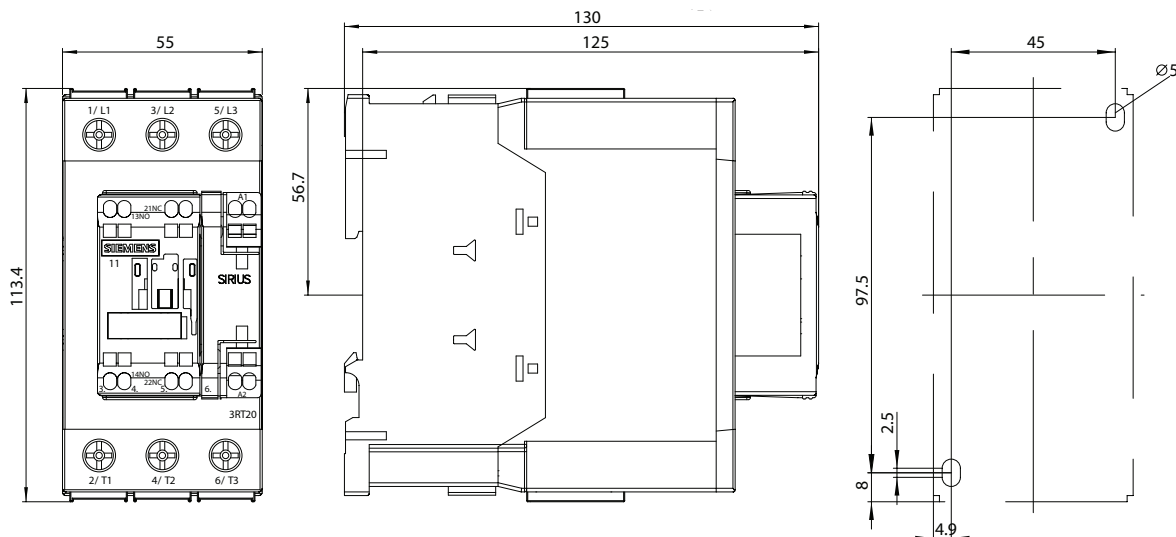
- a = 0 mm with varistor < 240 V, diode assembly
- a = 3.5 mm with varistor > 240 V
- a = 17 mm with RC element
- b = DC 15 mm deeper than AC

- 1) Auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole)
- 3) Surge suppressor
- 4) Drilling pattern

Dimension drawings

3RT20 3 contactors

Size S2, Spring-type terminal connection
with surge suppressor, auxiliary switch blocks and mounted overload relay



For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

For size S2:

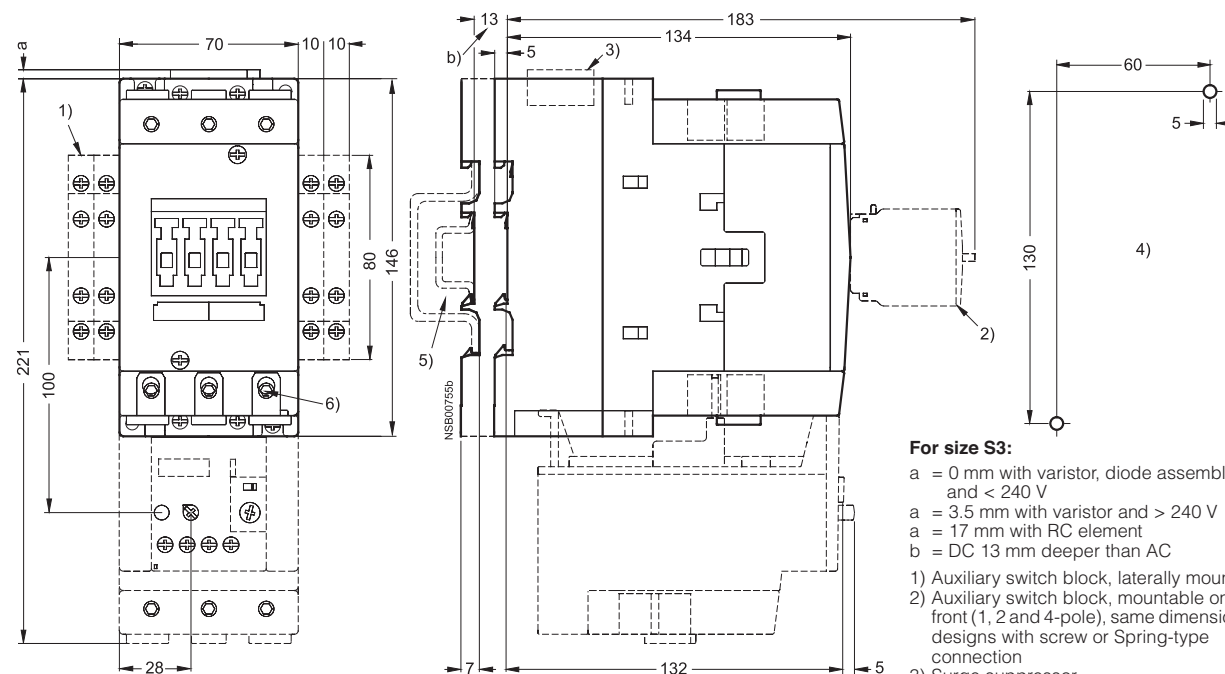
- a = 0 mm with varistor < 240 V, diode assembly
- a = 3.5 mm with varistor > 240 V
- a = 17 mm with RC element
- b = DC 15 mm deeper than AC

- 1) Auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole)
- 3) Surge suppressor
- 4) Drilling pattern

3RT10 4, 3RT14 46 contactors

Size S3 and NEMA Size 3, screw connection
with surge suppressor, auxiliary switch blocks and mounted overload relay

Lateral clearance from
earthed parts = 6 mm



For size S3:

- a = 0 mm with varistor, diode assembly and < 240 V
- a = 3.5 mm with varistor and > 240 V
- a = 17 mm with RC element
- b = DC 13 mm deeper than AC

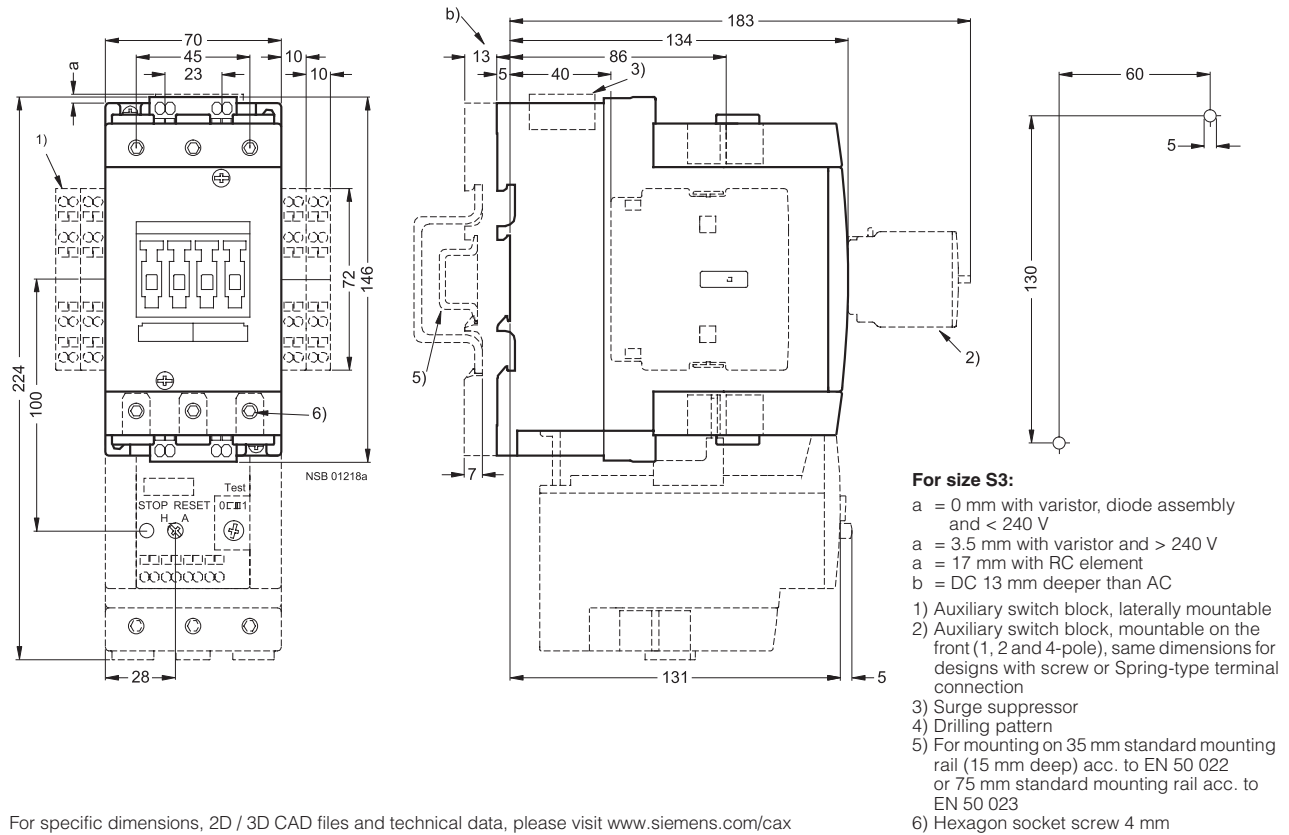
- 1) Auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front (1, 2 and 4-pole), same dimensions for designs with screw or Spring-type connection
- 3) Surge suppressor
- 4) Drilling pattern
- 5) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to EN 50 022 or 75 mm standard mounting rail acc. to EN 50 023
- 6) Hexagon socket screw 4 mm

For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

3RT10 contactors, 3-pole

Dimension drawings

3RT10 4 contactors,
Size S3, Spring-type terminal connection
with surge suppressor, auxiliary switch blocks
and mounted overload relay



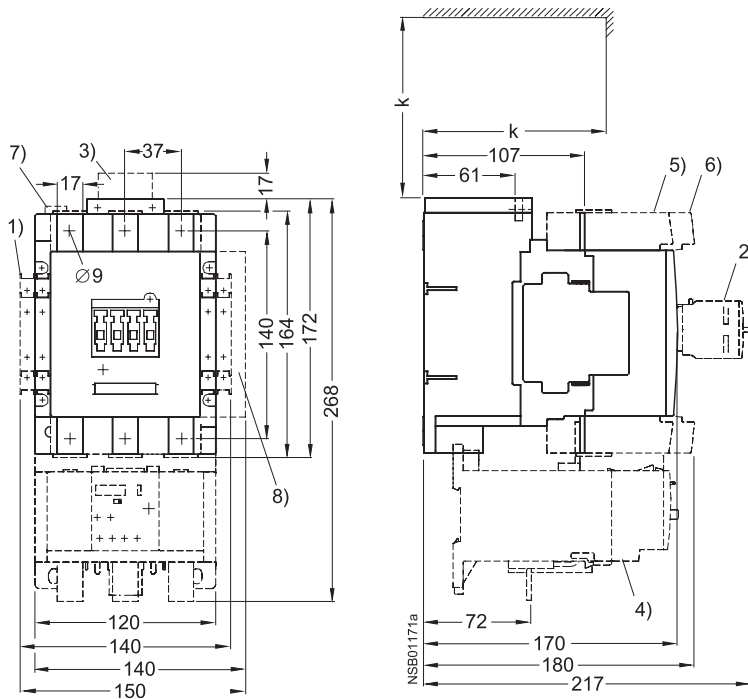
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax



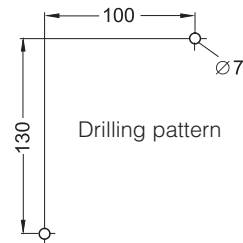
Dimension drawings

3RT10 5, 3RT14 5 contactors Size S6 and NEMA Size 4

with auxiliary switch block, laterally mountable and mountable on the front,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication



Clearance from earthed parts with
directly mounted overload relay:
lateral: 10 mm
front: 20 mm



For size S6:

k = 120 mm (minimum clearance for removing the
withdrawable coil)

- 1) Second auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front
- 3) RC element
- 4) 3RB10 overload relay, mounted
- 5) 3RT19 55-4G box terminal block
(hexagon socket 4 mm)
- 6) 3RT19 56-4G box terminal block
(hexagon socket 4 mm)
- 7) PLC connection DC 24 V and changeover switch
(with 3RT1...-N)
- 8) Electronics module with remaining lifetime indication
(auxiliary switch block not mountable on right-
hand side)

For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

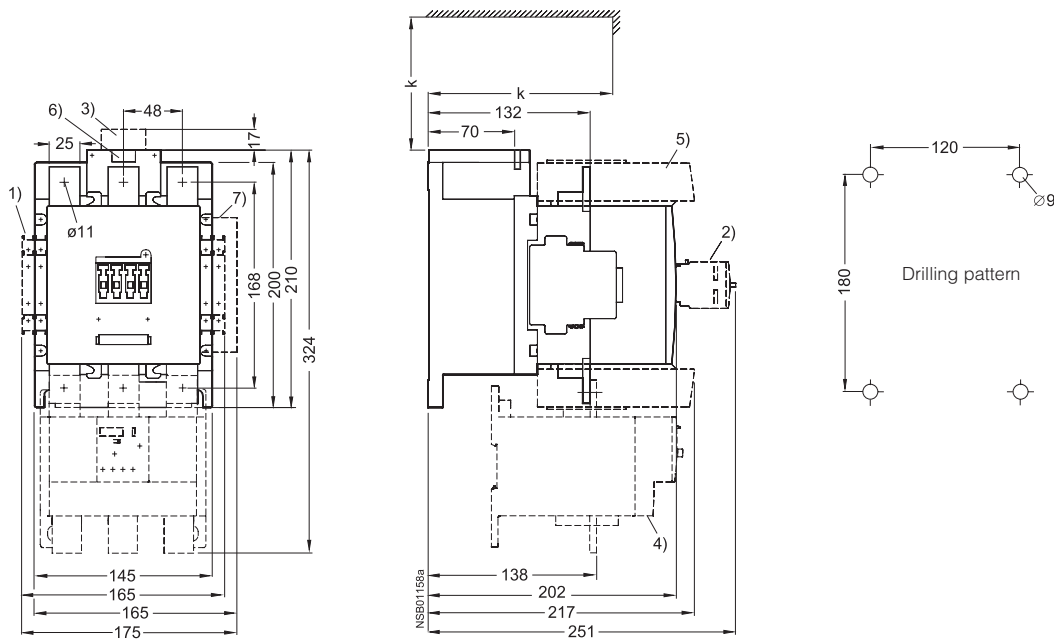
3RT10 and 3RT14 contactors, 3-pole

Dimension drawings

3RT10 6, 3RT14 6 contactors

Size S10

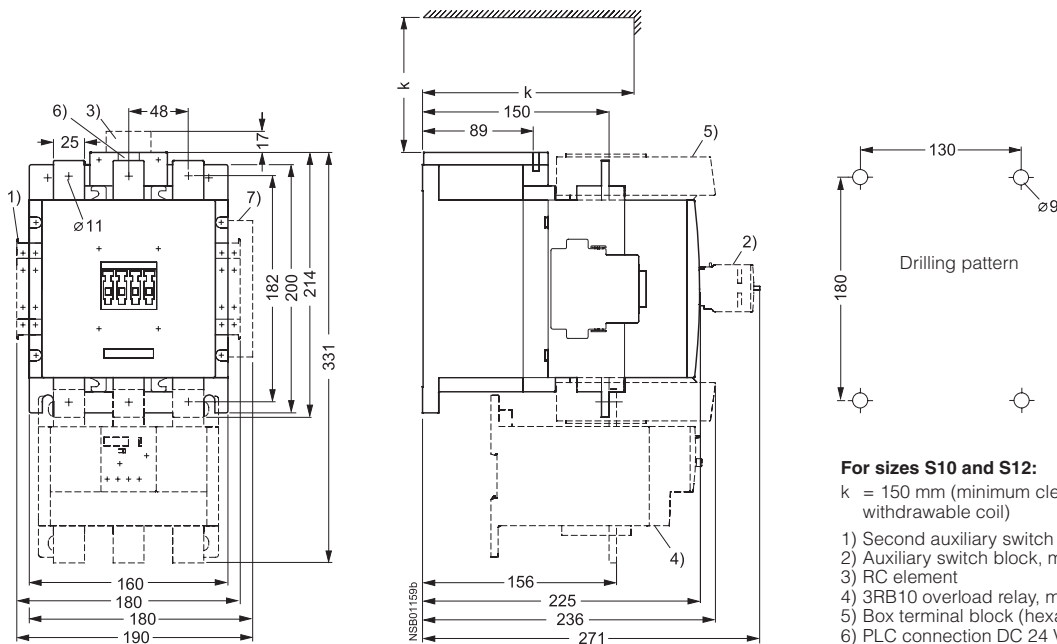
with auxiliary switch block, laterally mountable and mountable on the front,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication



3RT10 7, 3RT14 7 contactors

Size S12

with auxiliary switch block, laterally mountable and mountable on the front,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication



For sizes S10 and S12:

Clearance from earthed parts with directly mounted

overload relay:

lateral: 10 mm

front: 20 mm

For sizes S10 and S12:

k = 150 mm (minimum clearance for removing the withdrawable coil)

- 1) Second auxiliary switch block, laterally mountable
- 2) Auxiliary switch block, mountable on the front
- 3) RC element
- 4) 3RB10 overload relay, mounted
- 5) Box terminal block (hexagon socket 6 mm)
- 6) PLC connection DC 24 V and changeover switch (with 3RT1...-N)
- 7) Electronics module with remaining lifetime indication (auxiliary switch block not mountable on right-hand side)

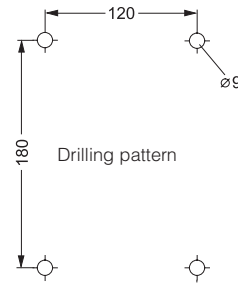
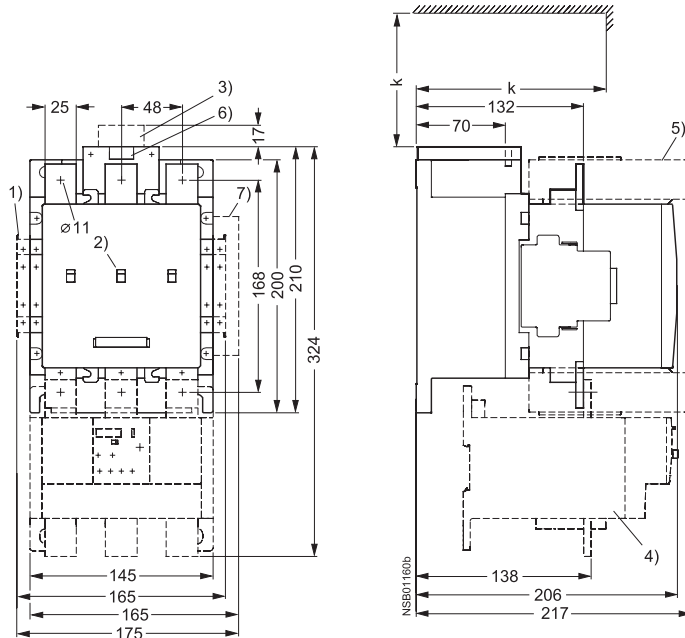
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

3RT12 6 vacuum contactors

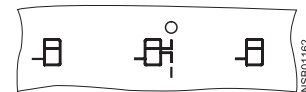
Size S10

with auxiliary switch block, laterally mountable,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication



Detail

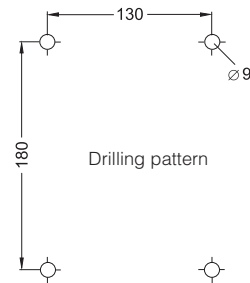
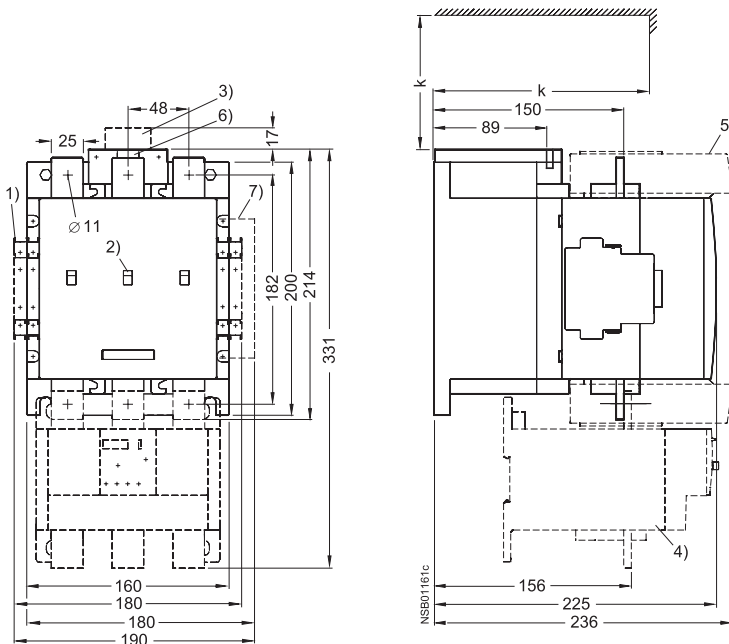
Contact erosion indicator for vacuum interrupters



3RT12 7 vacuum contactors

Size S12

with auxiliary switch block, laterally mountable,
mounted overload relay and box terminals,
laterally mounted electronics module with remaining lifetime indication



For sizes S10 and S12:

k = 150 mm (minimum clearance for removing the withdrawable coil)

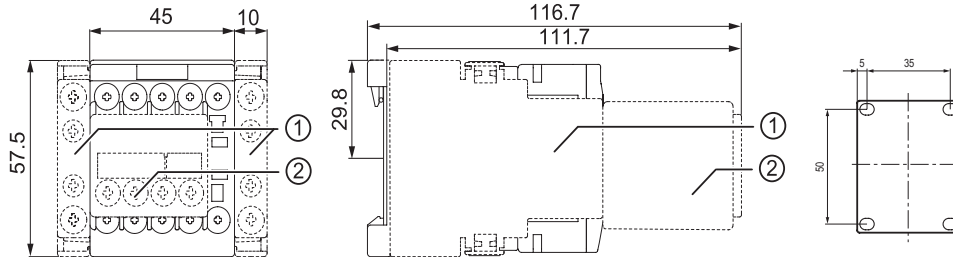
- 1) Second auxiliary switch block, laterally mountable
- 2) Position and contact erosion indicator
- 3) RC element
- 4) 3RB10 overload relay, mounted
- 5) Box terminal block (hexagon socket 6 mm)
- 6) PLC connection DC 24 V and changeover switch (with 3RT1...-N)
- 7) Electronics module with remaining lifetime indication (auxiliary switch block not mountable on right-hand side)

For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

3RT23 1 and 3RT25 1 contactors

Size S00, screw connection
with surge suppressor and auxiliary switch block



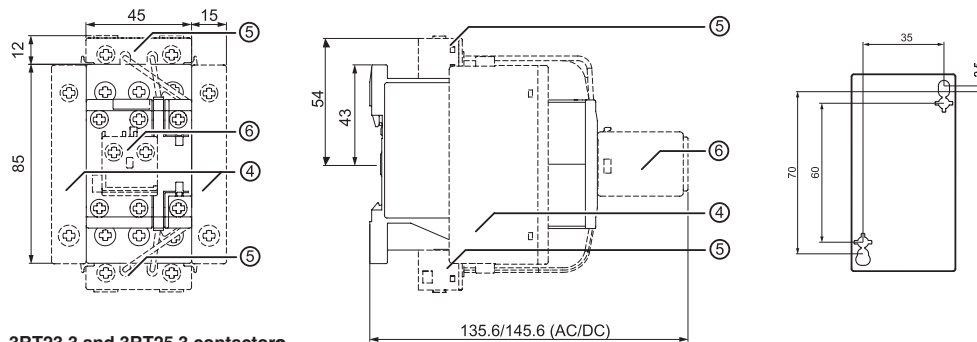
Lateral clearance from
earthed parts = 6 mm

For size S00:

- 1) Laterally mountable auxiliary switch block 3RH2911-1DA.. / -1DE.. / -1EE..
- 2) Auxiliary switch block for mounting on the front 3RH2911-1FA.. / -1GA.. / -1HA.. / -1NF..

3RT23 2 and 3RT25 2 contactors

Size S0 with coil terminal module
and auxiliary switch block

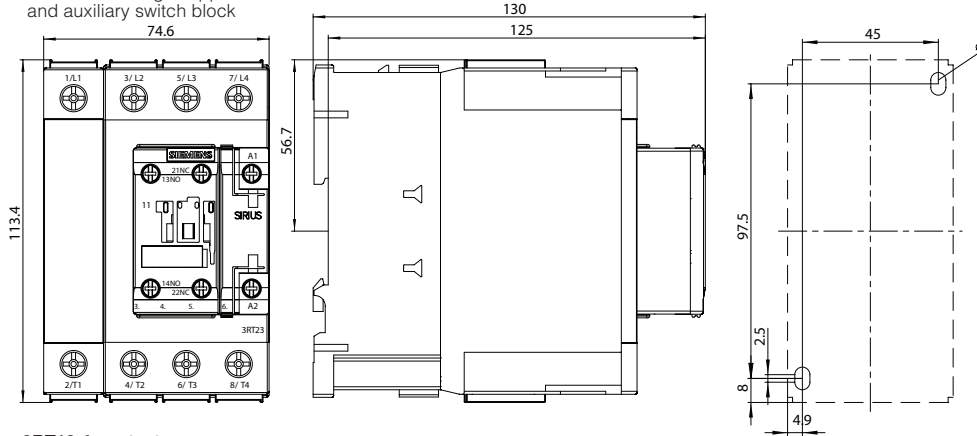


For size S0:

- 4) 4-pole contactor for switching 4 resistive loads 3RT232. 4-pole pole-changing contactor for changing the polarity of hoisting gear motors (2 NO contacts and 2 NC contacts) 3RT252.
- 5) Coil terminal module 3RT2926-4RA11/-4RB11
- 6) Auxiliary switch block for mounting on the front 3RH2911-1AA.. / -1BA

3RT23 3 and 3RT25 3 contactors

Size S2 with surge suppressor
and auxiliary switch block

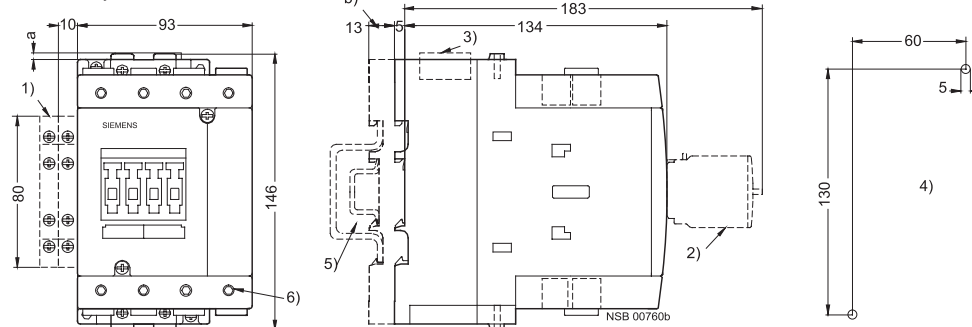


For sizes S2 and S3:

- a = 0 mm with varistor < 240 V
 - a = 3.5 mm with varistor > 240 V
 - a = 17 mm with RC element and diode assembly
 - b = S2: DC 15 mm deeper than AC
 - S3: DC 13 mm deeper than AC
- 1) Auxiliary switch block, laterally mountable (right or left)
 - 2) Auxiliary switch block, mountable on the front, (1, 2 and 4-pole, also 3RH19 21-1FE22 solid-state compatible design)
 - 3) Surge suppressor
 - 4) Drilling pattern
 - 5) For mounting on 35 mm standard mounting rail (15 mm deep) acc. to EN 50 022 or, in the case of size S3, 75mm standard mounting rail acc. to EN 50 023
 - 6) Hexagon socket screw 4 mm

3RT13 4 contactors

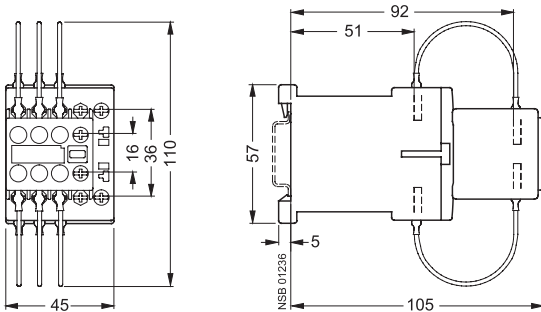
Size S3 with surge suppressor
and auxiliary switch block



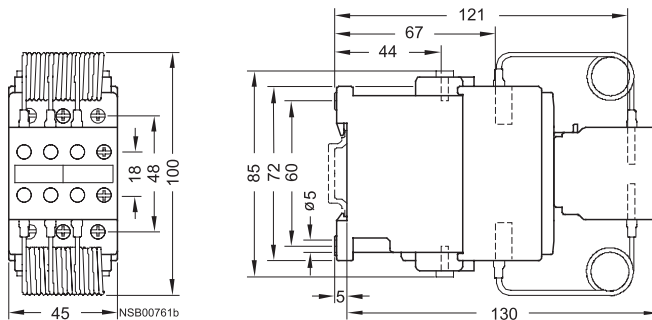
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

Dimension drawings

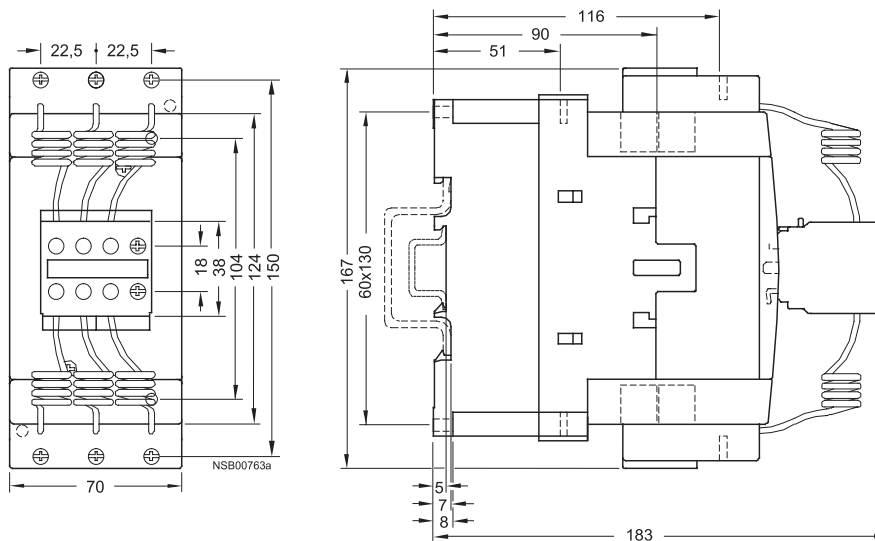
3RT16 17 capacitor contactors Size S00



3RT16 27 capacitor contactors Size S0



3RT16 47 capacitor contactors Size S3



For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

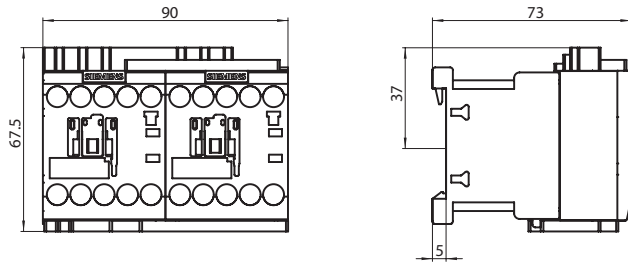
3RA13/23 contactor assemblies for reversing

• Revised •
10/22/15

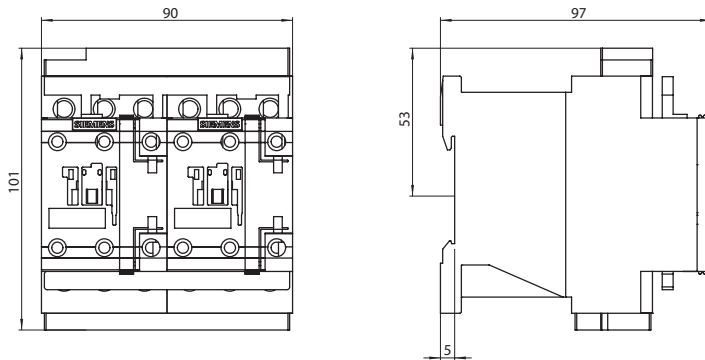


Dimension drawings

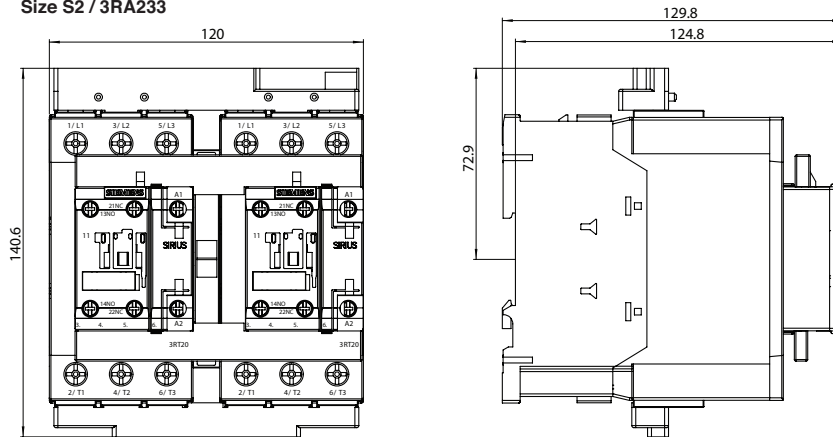
Size S00 / 3RA231



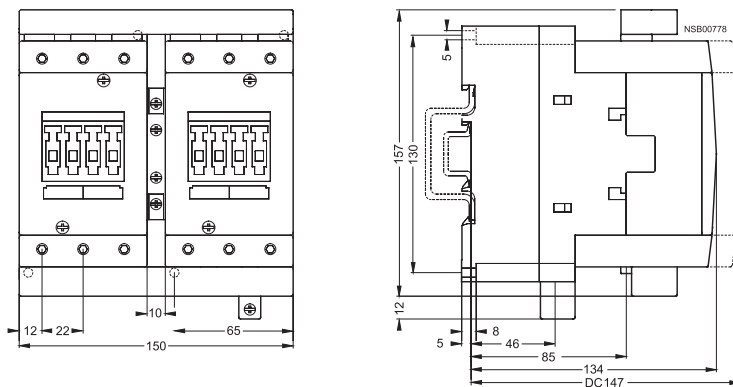
Size S0 / 3RA232



Size S2 / 3RA233



Size S3 / 3RA134

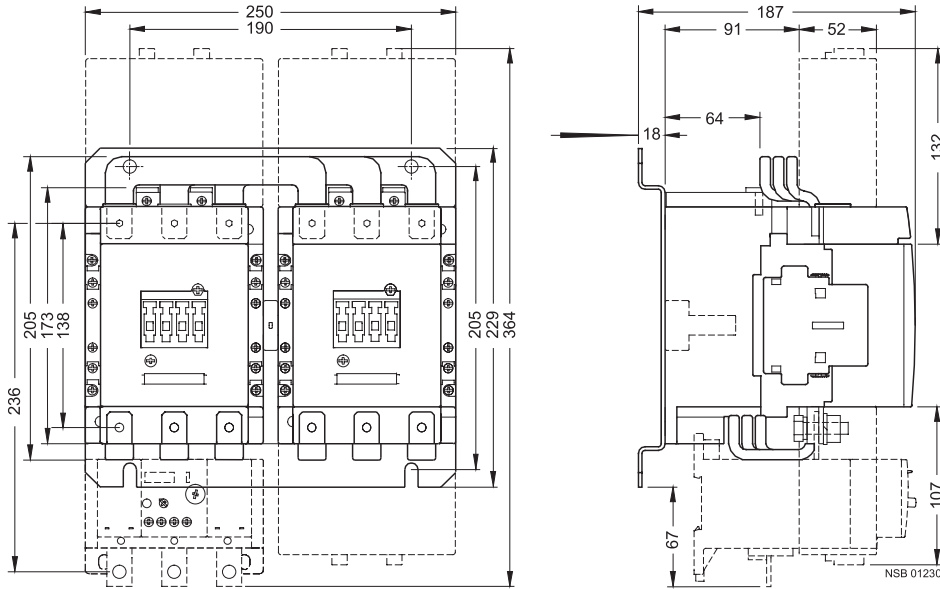


For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

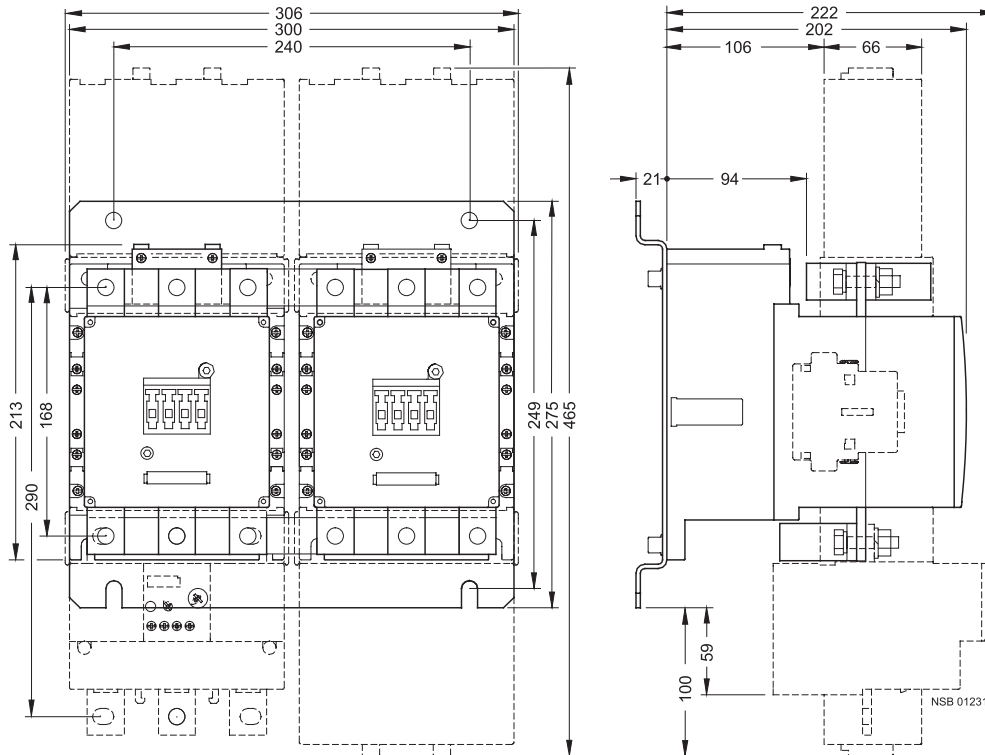


Dimension drawings

Size S6



Size S10

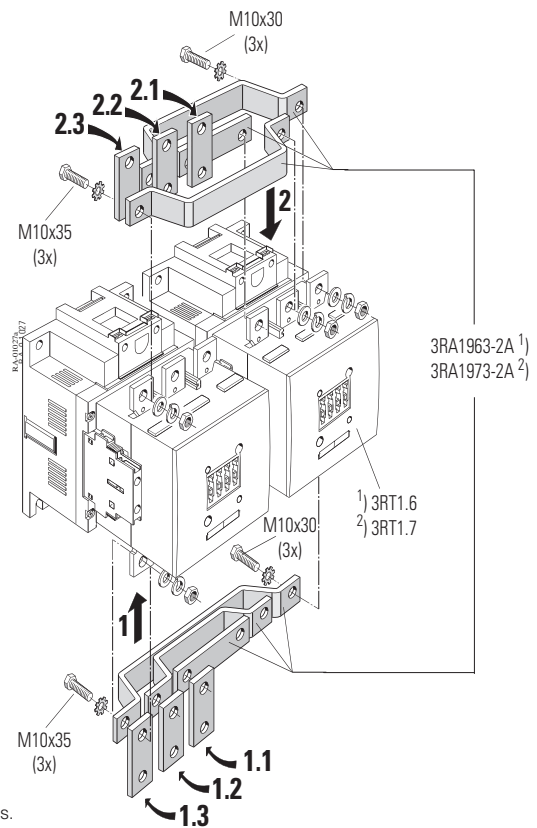
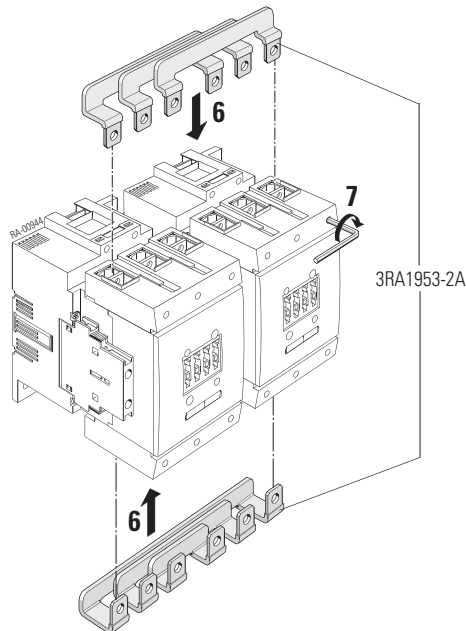
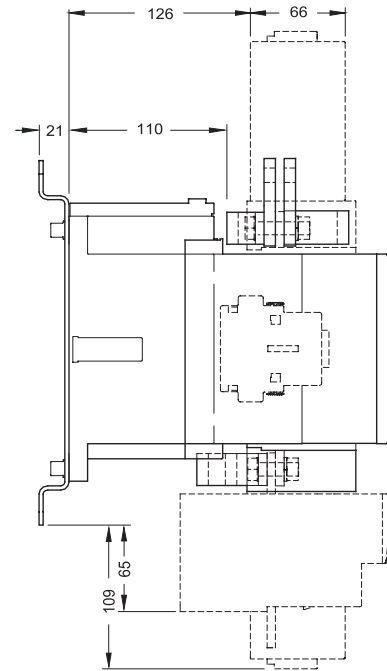
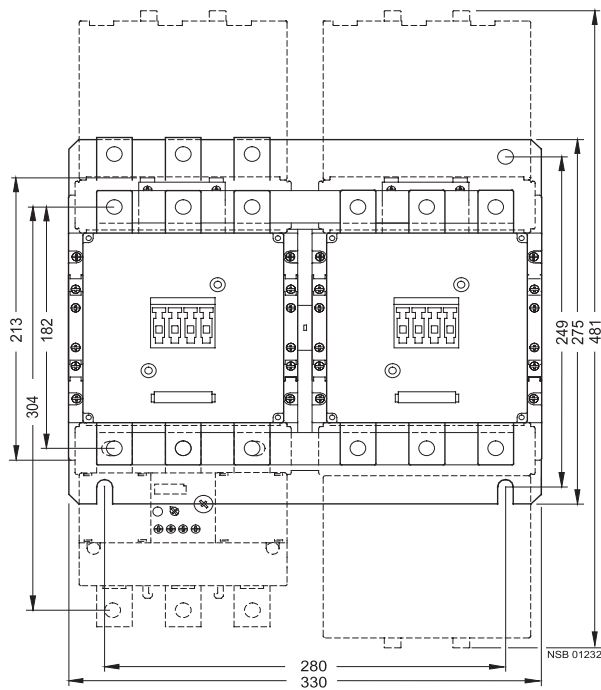


The assemblies shown on this page are for customer assembly with individual components.

3RA13 contactor assemblies for reversing

Dimension drawings

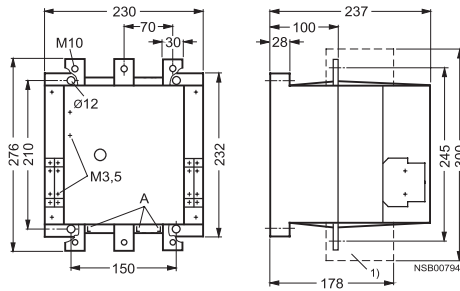
Size S12



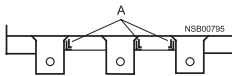
The assemblies shown on this page are for customer assembly with individual components.

Dimension drawings

3TF68 vacuum contactors

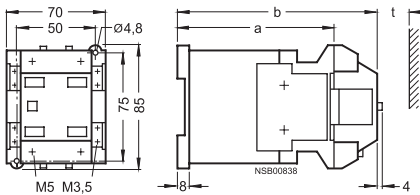


Detail
A = Contact erosion indicator for vacuum interrupter contacts



3TC4 and 3TC5 contactors

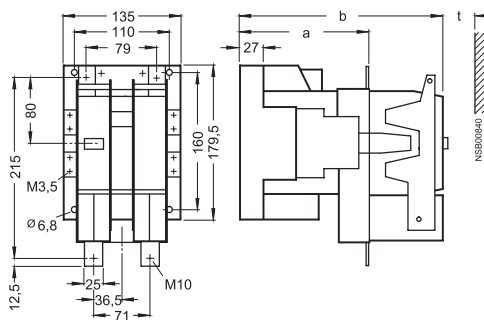
3TC44 contactors Size 2, AC and DC operation



t = minimum clearance from insulated components: 15 mm (600 V and 750 V)
from grounded components: 30 mm (600 V and 750 V)

	a	b
DC operation	109	141
AC operation	68	100

3TC52 contactors Size 8, AC and DC operation

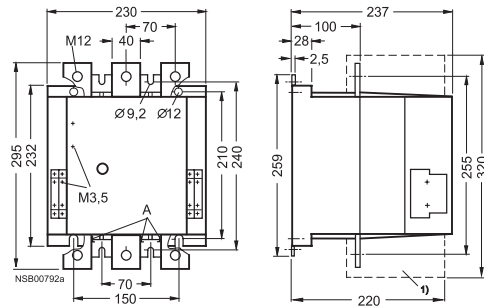


t = minimum clearance from insulated components: 20 mm (600 V and 750 V)
from grounded components: 70 mm (600 V and 750 V)

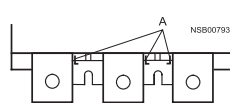
	a	b
DC operation	147	232
AC operation	115	200

1) With box terminals for laminated copper bars (accessories).

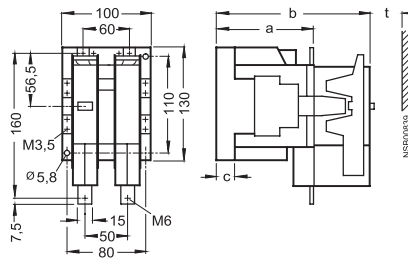
3TF69 vacuum contactors



Detail
A = Contact erosion indicator for vacuum interrupter contacts



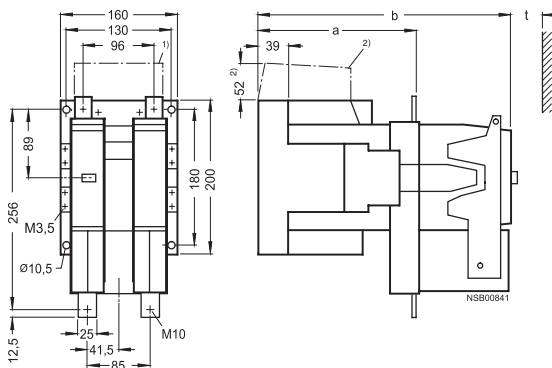
3TC48 contactors Size 4, AC and DC operation



t = minimum clearance from insulated components: 15 mm (600 V),
20 mm (750 V)
from grounded components: 35 mm (600 V),
55 mm (750 V)

	a	b	c
DC operation	112	180	21.5
AC operation	86	154	23.5

3TC56 contactors Size 12, AC and DC operation



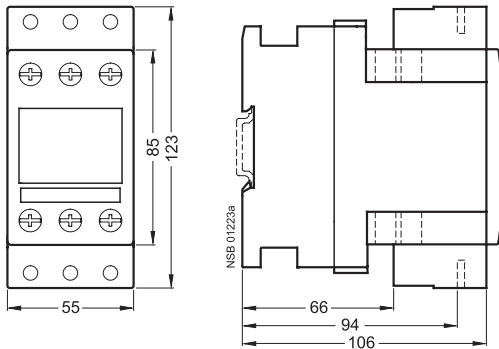
t = minimum clearance from insulated components: 25 mm (600 V and 750 V)
from grounded components: 80 mm (600 V),
100 mm (750 V)

	a	b
DC operation	200	310
AC operation	141	251

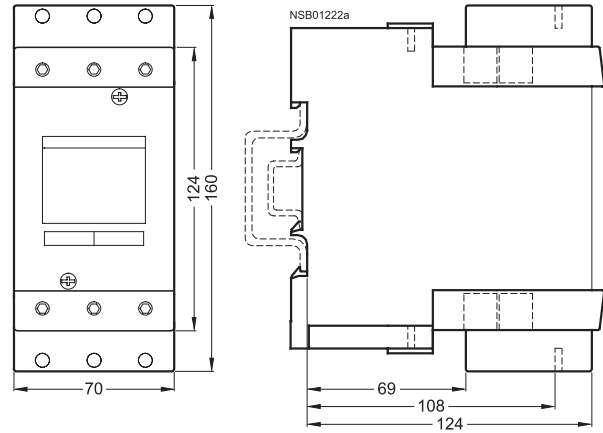
2) DC operation only

Dimension drawings

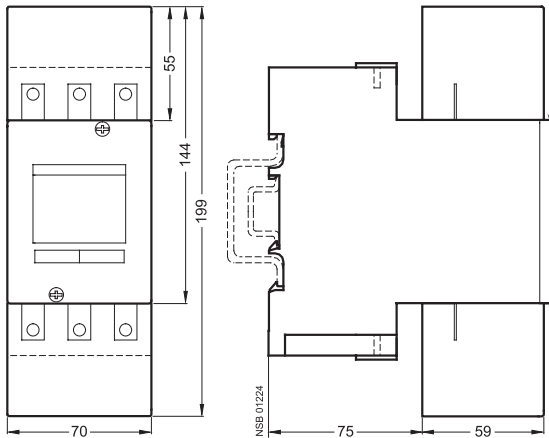
**Terminal cover for box terminals
for size S2,
3RT29 36-4EA2**



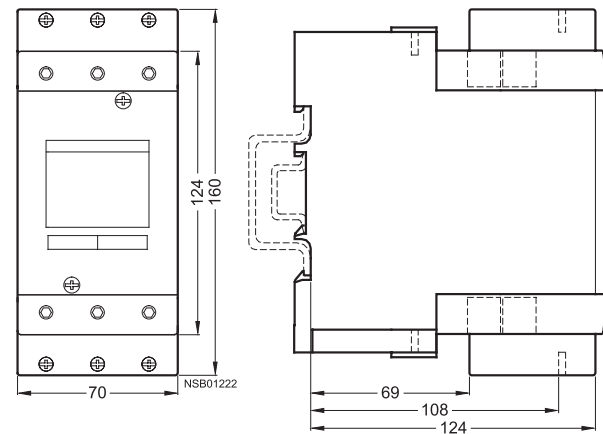
**Terminal cover for box terminals
for size S3,
3RT19 46-4EA2**



**Terminal cover for cable lug and bar connection
for size S3,
3RT19 46-4EA1**



**Auxiliary conductor terminal, 3-pole
3RT19 46-4F
Size S3
mounted on contactor**

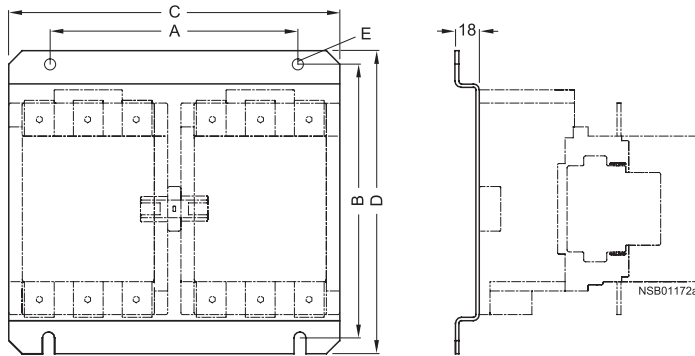


For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax



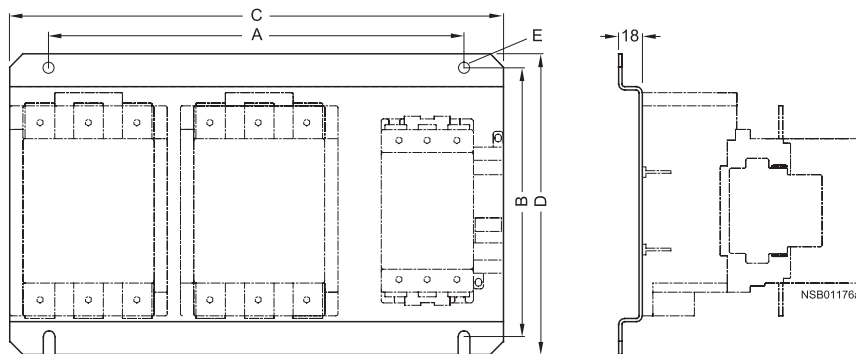
Dimension drawings

3RA19.2-2A baseplates for reversing contactor assemblies



	A	B	C	D	E
S6	190	205	250	229	9
S10	240	249	300	275	11
S12	280	249	330	275	11

3RA19.2-2E, 3RA19.2-2F baseplates for star-delta assemblies



	A	B	C	D	E
S6-S6-S3	316	205	376	229	9
S6-S6-S6	343	205	403	229	9
S10-S10-S6	393	250	453	275	11
S10-S10-S10	423	250	483	275	11
S12-S12-S10	450	250	510	275	11
S12-S12-S12	465	250	525	275	11

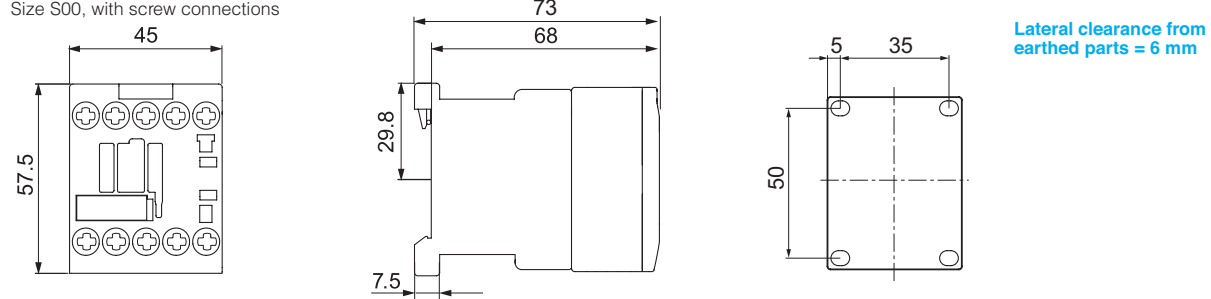
For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

3RH21 and 3RH24 control relays

Dimension drawings

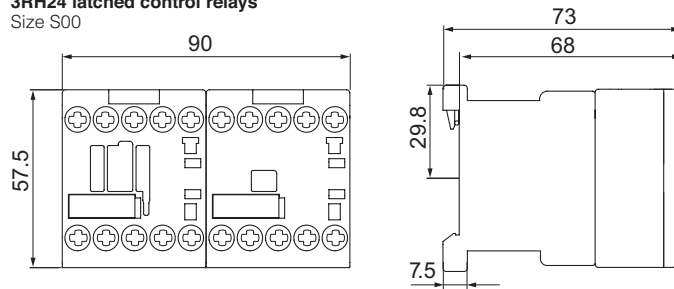
3RH21 control relays

Size S00, with screw connections



3RH24 latched control relays

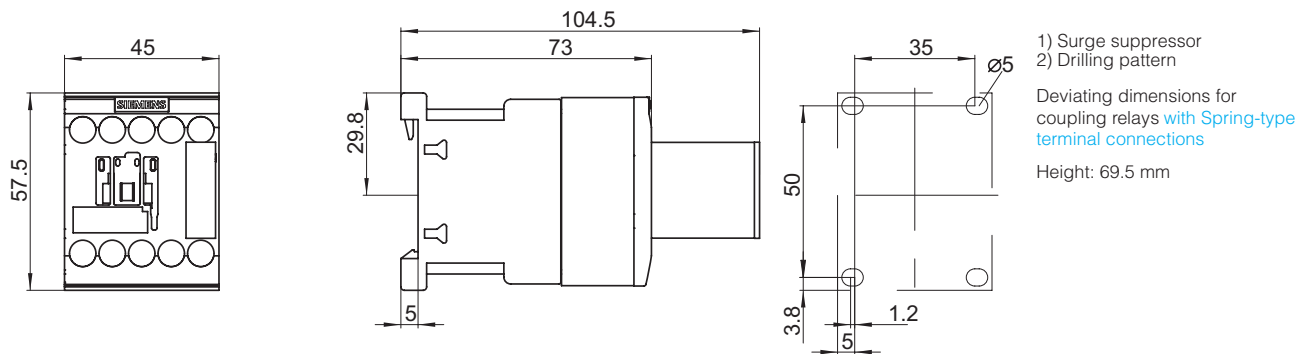
Size S00



3RH21 coupling relay

Dimension drawings

Size S00, with screw connections, with surge suppressor

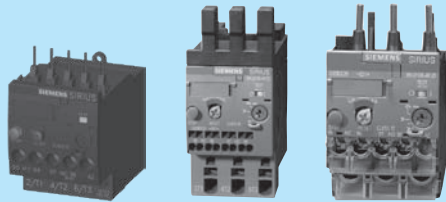


For specific dimensions, 2D / 3D CAD files and technical data, please visit www.siemens.com/cax

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Thermal overload relays



3RU11 / 3RU21 overload relays up to 100 A with screw connection, CLASS 10

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Solid state overload relays



3RB24 overload relays up to 630A with IO-Link current monitoring

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Solid state overload relays



3RB20/21, 3RB30/31 overload relays up to 630 A, 3RB20/30 CLASS 10 or 20 3RB21/31 CLASS 5, 10, 20, 30

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3RB22/23 overload relays up to 820 A for full motor protection, CLASS 5 to CLASS 30 adjustable

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3UF7 SIMOCODE Pro Motor management and control devices

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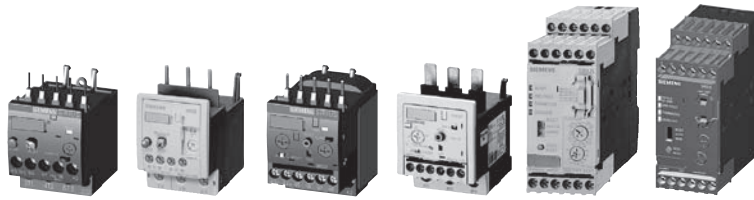
Selection and ordering data

- Basic Unit 3/69-3/72
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General data

Overview

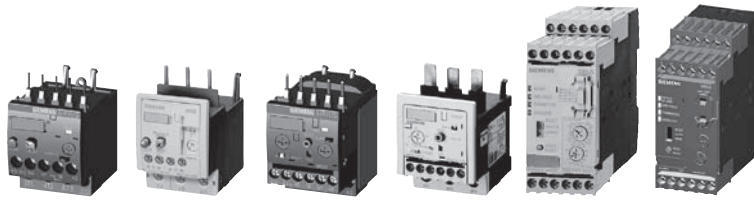


Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
General data							
Sizes	S00, S0, S2	S3	S00, S0, S2	S3 ... S12	S00 ... S12	S00 ... S12	<ul style="list-style-type: none">• Are coordinated with the dimensions, connections and technical characteristics of the other devices in the SIRIUS modular system (contactors, etc., ...)• Permit the mounting of slim and compact load feeders in widths of 45 mm (S00), 45 mm (S0), 55 mm (S2), 70 mm (S3), 120 mm (S6) and 145 mm (S10/S12); this does not include the current measuring modules for the 3RB22 to 3RB24 evaluation modules sizes S00 to S3• Simplify configuration
Seamless current range	0.11 ... 80 A	18 ... 100 A	0.1 ... 80 A	12.5 ... 630 A	0.3 ... 630 A (up to 820 A) ¹⁾	0.3 ... 630 A (up to 820 A) ¹⁾	<ul style="list-style-type: none">• Allows easy and consistent configuration with one series of overload relays (for small to large loads)
Protection functions							
Tripping due to overload	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none">• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to overload
Tripping due to phase unbalance	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none">• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to phase unbalance
Tripping due to phase failure	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none">• Minimizes heating of induction motors during phase failure
Protection of single-phase loads	✓	✓	—	—	✓	✓	<ul style="list-style-type: none">• Enables the protection of single-phase loads
Tripping in the event of overheating by integrated thermistor motor protection function	— ²⁾	— ²⁾	— ²⁾	— ²⁾	✓	✓	<ul style="list-style-type: none">• Provides optimum temperature-dependent protection of loads against excessive temperature rises e.g. for stator-critical motors or in the event of insufficient coolant flow, contamination of the motor surface or for long starting or braking operations• Eliminates the need for additional special equipment• Saves space in the control cabinet• Reduces wiring outlay and costs
Tripping in the event of a ground fault by internal ground-fault detection (activatable)	—	—	✓ (only 3RB31)	✓ (only 3RB21)	✓	✓	<ul style="list-style-type: none">• Provides optimum protection of loads against high-resistance short circuits or ground faults due to moisture, condensed water, damage to the insulation material, etc.• Eliminates the need for additional special equipment• Saves space in the control cabinet• Reduces wiring outlay and costs

✓ Available
— Not available

¹⁾ Motor currents up to 820 A can be recorded and evaluated by a current measuring module, e.g. 3RB29 06-2BG1 (0.3 to 3 A), in combination with a 3UF18 68-3GA00 (820 A/1 A) series transformer.

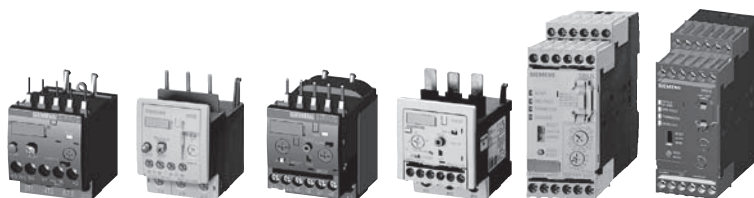
²⁾ The SIRIUS 3RN thermistor motor protection devices can be used to provide additional temperature-dependent protection.



Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
Features							
RESET function	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Allows manual or automatic resetting of the device
Remote RESET function	✓ (by means of separate module)	✓ (by means of separate module)	✓ (only with 3RB31 and external auxiliary voltage 24 V DC)	✓ (only with 3RB21 and external auxiliary voltage 24 V DC)	✓ (electrically via external button)	✓ (electrically with button or via IO-Link)	<ul style="list-style-type: none"> Allows the remote resetting of the device
TEST function for auxiliary contacts	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Allows easy checking of the function and wiring
TEST function for electronics	—	—	✓	✓	✓	✓	<ul style="list-style-type: none"> Allows checking of the electronics
Status display	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Displays the current operating state
Large current adjustment button	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Makes it easier to set the relay exactly to the correct current value
Integrated auxiliary contacts (1 NO + 1 NC)	✓	✓	✓	✓	✓ (2 ×)	—	<ul style="list-style-type: none"> Allows the load to be switched off if necessary Can be used to output signals
Integrated auxiliary contacts (1 CO and 1 NO in series)	—	—	—	—	—	✓	<ul style="list-style-type: none"> Enables the controlling of contactors directly from the higher-level control system through IO-Link
IO-Link connection	—	—	—	—	—	✓	<ul style="list-style-type: none"> Reduction of wiring in the control cabinet Enables communication
Connection of optional handheld device	—	—	—	—	—	✓	<ul style="list-style-type: none"> Enables local operation
Communication capability through IO-Link							
Full starter functionality through IO-Link	—	—	—	—	—	✓	<ul style="list-style-type: none"> Enables in combination with the SIRIUS 3RT contactors the assembly of communication-capable motor starters (direct-on-line, reversing and wye-delta starting)
Reading out of diagnostics functions	—	—	—	—	—	✓	<ul style="list-style-type: none"> Enables the reading out of diagnostics information such as overload, open circuit, ground fault, etc.
Reading out of current values	—	—	—	—	—	✓	<ul style="list-style-type: none"> Enables the reading out of current values and their direct processing in the higher-level control system
Reading out all set parameters	—	—	—	—	—	✓	<ul style="list-style-type: none"> Enables the reading out of all set parameters, e.g. for plant documentation

✓ Available

— Not available



Features

3RU21

3RU11

3RB30/3RB31

3RB20/3RB21

3RB22/3RB23

3RB24

Benefits

Design of load feeders

Short-circuit strength up to 100 kA at 690 V
(in conjunction with the corresponding fuses or the corresponding motor starter protector)

✓

✓

✓

✓

✓

✓

- Provides optimum protection of the loads and operating personnel in the event of short circuits due to insulation faults or faulty switching operations

Electrical and mechanical matching to 3RT contactors

✓

✓

✓

✓

✓¹⁾

✓¹⁾

- Simplifies configuration
- Reduces wiring outlay and costs
- Enables stand-alone installation as well as space-saving direct mounting

Straight-through transformers for main circuit²⁾
(in this case the cables are routed through the feed-through openings of the overload relay and connected directly to the box terminals of the contactor)

—

—

✓
(S2)

✓
(S3 ... S6)

✓
(S00 ... S6)

✓
(S00 ... S6)

- Reduces the contact resistance (only one point of contact)
- Saves wiring costs (easy, no need for tools, and fast)
- Saves material costs
- Reduces installation costs

Spring-type connection system for main circuit²⁾

✓
(S00, S0)

—

✓
(S00, S0)

—

—

—

- Enables fast connections
- Permits vibration-resistant connections
- Enables maintenance-free connections

Spring-type connection system for auxiliary circuits²⁾

✓

✓

✓

✓

✓

✓

- Enables fast connections
- Permits vibration-resistant connections
- Enables maintenance-free connections

Ring terminal lug connection method for main and auxiliary circuits²⁾

✓
(S00, S0)

—

—

—

—

—

- Enables fast connections
- Permits vibration-resistant connections
- Enables maintenance-free connections

Full starter functionality through IO-Link

—

—

—

—

—

✓

- Enables in combination with the SIRIUS 3RT contactors the assembly of communication-capable motor starters (direct-on-line, reversing and wye-delta starting)

Starter function

—

—

—

—

—

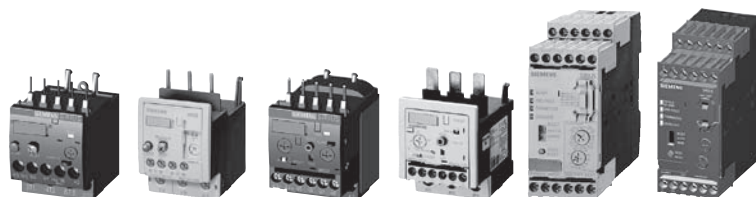
✓

- Integration of feeders via IO-Link in the control system up to 630 A or 820 A

✓ Available
— Not available

¹⁾ Exception: up to size S3, only stand-alone installation is possible.

²⁾ Alternatively available for screw terminals.



Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
Other features							
Temperature compensation	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Allows the use of the relays at high temperatures without derating Prevents premature tripping Allows compact installation of the control cabinet without distance between the devices/load feeders
Very high long-term stability	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> Provides safe protection for the loads even after years of use in severe operating conditions
Wide setting ranges	—	—	✓ (1:4)	✓ (1:4)	✓ (1:10)	✓ (1:10)	<ul style="list-style-type: none"> Minimize the configuration outlay and costs Minimize storage overheads, storage costs, tied-up capital
Fixed trip class	CLASS 10 CLASS 10A	CLASS 10	3RB30: CLASS 10E or CLASS 20E	3RB20: CLASS 10 or CLASS 20			<ul style="list-style-type: none"> Optimum motor protection for standard starts
Trip classes adjustable on the device CLASS 5, 10, 20, 30	—	—	3RB31: ✓	3RB21: ✓	✓	✓	<ul style="list-style-type: none"> Enables solutions for very fast starting motors requiring special protection (e.g. Ex motors) Enables heavy starting solutions Reduces the number of versions
Low power loss	—	—	✓	✓	✓	✓	<ul style="list-style-type: none"> Reduces energy consumption and energy costs (up 98 % less energy is used than for thermal overload relays). Minimizes temperature rises of the contactor and control cabinet – in some cases this may eliminate the need for control-gear cabinet cooling. Direct mounting to contactor saves space, even for high motor currents (i.e. no heat decoupling is required).
Internal power supply	— ¹⁾	— ¹⁾	✓	✓	—	—	<ul style="list-style-type: none"> Eliminates the need for configuration and connecting an additional control circuit
Supplied from an external voltage through IO-Link	—	—	—	—		✓	<ul style="list-style-type: none"> Eliminates the need for configuration and connecting an additional control circuit
Overload warning	—	—	—	—	✓	✓	<ul style="list-style-type: none"> Indicates imminent tripping of the relay directly on the device due to overload, phase unbalance or phase failure through flickering of the LEDs or in the case of the 3RB24 as a signal through IO-Link Allows the imminent tripping of the relay to be signaled Allows measures to be taken in time in the event of inverse-time delayed overloading of the load for an extended period over the current limit
Analog output	—	—	—	—	✓	✓	<ul style="list-style-type: none"> Allows the output of an analog output signal for actuating moving-coil instruments, feeding programmable logic controllers or transfer to bus systems Eliminates the need for an additional measuring transducer and signal converter

✓ Available
— Not available

¹⁾ SIRIUS 3RU11 and 3RU21 thermal overload relays use a bimetal contactor and therefore do not require a control supply voltage.

General data

Overview of overload relays – matching contactors

Overload relays	Current measurement	Current range	Contactors (type, size, rating in HP)							
			3RT20 1.	3RT20 2.	3RT20 3.	3RT10 4.	3RT10 5.	3RT10 6.	3RT10 7.	3TF68/3TF69
Type	Type	A	S00	S0	S2	S3	S6	S10	S12	Size 14
			3/5/7.5/10	5/7.5/10/15/20/25	30/40/50	50/60/70	100/125/150	150/200/250	300/400	500/700

SIRIUS 3RU21 thermal overload relays



3RU21

3RU21 1	Integrated	0.11 ... 16	✓	—	—	—	—	—	—	—
3RU21 2	Integrated	1.8 ... 40	—	✓	—	—	—	—	—	—
3RU21 3	Integrated	22 ... 80	—	—	✓	—	—	—	—	—

SIRIUS 3RU11 thermal overload relays



3RU11

3RU11 4	Integrated	18 ... 10	—	—	—	✓	—	—	—	—
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SIRIUS 3RB30 solid-state overload relays¹⁾



3RB30

3RB30 1	Integrated	0.1 ... 16	✓	—	—	—	—	—	—	—
3RB30 2	Integrated	0.1 ... 40	—	✓	—	—	—	—	—	—
3RB30 3	Integrated	12 ... 80	—	—	✓	—	—	—	—	—

SIRIUS 3RB31 solid-state overload relays¹⁾



3RB31

3RB31 1	Integrated	0.1 ... 16	✓	—	—	—	—	—	—	—
3RB31 2	Integrated	0.1 ... 40	—	✓	—	—	—	—	—	—
3RB31 3	Integrated	12 ... 80	—	—	✓	—	—	—	—	—

SIRIUS 3RB20 solid-state overload relays¹⁾



3RB20

3RB20 4	Integrated	12.5 ... 100	—	—	—	✓	—	—	—	—
3RB20 5	Integrated	50 ... 200	—	—	—	—	✓	—	—	—
3RB20 6	Integrated	55 ... 630	—	—	—	—	—	✓	✓	✓
3RB20 1 + 3UF18	Integrated	630 ... 820	—	—	—	—	—	—	—	✓

SIRIUS 3RB21 solid-state overload relays¹⁾



3RB21

3RB21 4	Integrate	12.5 ... 10	—	—	—	✓	—	—	—	—
3RB21 5	Integrated	50 ... 200	—	—	—	—	✓	—	—	—
3RB21 6	Integrated	55 ... 630	—	—	—	—	—	✓	✓	✓
3RB21 1 + 3UF18	Integrated	630 ... 820	—	—	—	—	—	—	—	✓



✓ Can be used
— Cannot be used

¹⁾ "Technical Specifications" for use of the overload relays with trip class ≥ CLASS 20 can be found in "Short-circuit protection with fuses for motor feeders".

Overview of overload relays – matching contactors (continued)

Overload relays	Current measurement	Current range	Contactors (type, size, rating in HP)							
			3RT20 1	3RT20 2	3RT20 3	3RT10 4	3RT10 5	3RT10 6	3RT10 7	3TF68/ 3TF69
Type	Type	A	S00	S0	S2	S3	S6	S10	S12	Size 14
			3/5/7.5/1.	5/7.5/10/15/20/25	30/40/50	50/60/75	100/125/150	150/200/250	300/400	500/700

SIRIUS 3RB22 to 3RB24 solid-state overload relays¹⁾

 3RB22, 3RB23	3RB22 83/ 3RB23 83/ 3RB24 83+	3RB29 0	0.3 ... 25	✓	✓	—	—	—	—	—	—
		3RB29 0	10 ... 100	✓	✓	✓	✓	—	—	—	—
		3RB29 5	20 ... 200	—	✓	✓	✓	✓	—	—	—
		3RB29 6	63 ... 630	—	—	—	—	—	✓	✓	✓
		3RB29 0 + 3UF18	630 ... 820	—	—	—	—	—	—	—	✓
 3RB24											

✓ Can be used
— Cannot be used

¹⁾ "Technical Specifications" for use of the overload relays with trip class ≥ CLASS 20 can be found in "Short-circuit protection with fuses for motor feeders".

Connection methods

Depending on the device version of the 3RU2 and 3RB3 overload relays, the terminals for screw terminals, spring-type terminals or ring terminal lug connection are configured for both the main and auxiliary circuit in frame sizes S00 and S0.

The 3RU11 thermal overload relays come with screw terminals.

The electronic overload relays 3RB20 and 3RB21 are available with screw terminals (box terminals) or spring-type terminals on the auxiliary current side; the same applies for the evaluation modules of the 3RB22 to 3RB24 electronic overload relays for High-Feature applications.

Overload Relays

Thermal Overload Relays

3RU11, 3RU21 up to 100 A,
CLASS 10



Description

The 3RU thermal overload relays up to 100 A are designed for current-dependent protection of applications with normal start-up conditions (see "Trip classes") against impermissibly high rises in temperature as a result of overload or phase failure (see "Phase failure protection"). An overload or phase failure causes the motor current to rise above the set rated motor current (see "Setting"). This current rise heats up the bimetal strips within the relay via heating elements which, in turn, operate the auxiliary contacts via a tripping mechanism due to their deflection (see "Auxiliary contacts"). These switch the load off via a contactor. The switch-off time is dependent on the ratio of tripping current to operational current I_e and is stored in the form of a tripping characteristic with long-term stability (see "Tripping characteristics"). The "Tripped" state is signalled by means of a switching position indicator (see "Indication of status").

Resetting takes place manually or automatically (see "Manual and automatic resetting") after a recovery time has elapsed (see "Recovery time").

The 3RU thermal overload relays are electrically and mechanically optimised to the 3RT contactors such that, in addition to individual mounting, they can also be directly mounted onto the contactors to save space (see "Design and mounting"). The main and auxiliary circuits can be connected in various ways (see "Connection"), including the use of Cage Clamp terminals. When the overload relay has been connected, it can be tested for correct functioning using a TEST slide (see "TEST function"). In addition to the TEST function, the 3RU thermal overload relay is equipped with a STOP function (see "STOP function").

For a wide variety of application possibilities for the 3RU thermal overload relay, please refer to the sections "Application", "Ambient conditions", "Overload relays in WYE-delta combinations" and "Operation with frequency converters".

The 3RU thermal overload relays can protect your loads from overload and phase failure. You must implement short-circuit protection (see "Short-circuit protection") by means of a fuse or circuit-breaker.

The 3RU thermal overload relays are environmentally friendly

(see "Environmental considerations") and comply with all the main international standards and approvals (see "Specifications" and "Increased safety type of protection EEx").

The accessories for the 3RU thermal overload relays have been designed on the principle that all requirements are covered by a small number of variants.

Application

The 3RU thermal overload relays are designed for the protection of three-phase and single-phase AC and DC motors.

If single-phase AC or DC loads are to be protected using 3RU thermal overload relays, all three bimetal strips should be heated. Therefore all main circuits of the relay must be connected in series.

Overload relays in WYE-delta combinations

When overload relays are used in WYE-delta combinations, it is important to note that only $1/\sqrt{3}$ of the motor current flows through the mains contactor. An overload relay mounted on the main contactor must be set to 0.58 times the motor current.

A second overload relay must be mounted on the star contactor if your load is also to be optimally protected in WYE operation. The WYE current is $1/3$ of the rated motor current. The relevant relay must be set to this current.

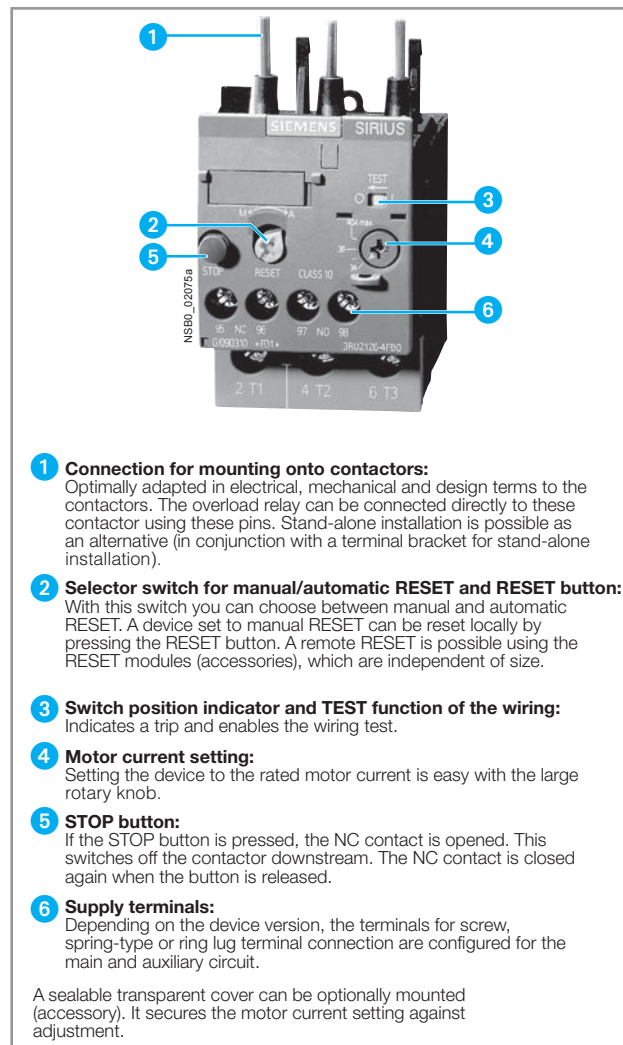
Control circuit

An additional power supply is not required for operation of the 3RU thermal overload relays.

Ambient conditions

The 3RU thermal overload relays are temperature compensating according to IEC 60 947-4-1/DIN VDE 0660 Part 102 in the temperature range -20°C to $+60^\circ\text{C}$. For temperatures from $+60^\circ\text{C}$ to $+80^\circ\text{C}$, the upper setting value of the setting range must be reduced by a specific factor as given in the table below.

Ambient temperature in $^\circ\text{C}$	Reduction factor for the upper setting value
+60	1.0
+65	0.94
+70	0.87
+75	0.81
+80	0.73



- Connection for mounting onto contactors:**
Optimally adapted in electrical, mechanical and design terms to the contactors. The overload relay can be connected directly to these contactor using these pins. Stand-alone installation is possible as an alternative (in conjunction with a terminal bracket for stand-alone installation).
- Selector switch for manual/automatic RESET and RESET button:**
With this switch you can choose between manual and automatic RESET. A device set to manual RESET can be reset locally by pressing the RESET button. A remote RESET is possible using the RESET modules (accessories), which are independent of size.
- Switch position indicator and TEST function of the wiring:**
Indicates a trip and enables the wiring test.
- Motor current setting:**
Setting the device to the rated motor current is easy with the large rotary knob.
- STOP button:**
If the STOP button is pressed, the NC contact is opened. This switches off the contactor downstream. The NC contact is closed again when the button is released.
- Supply terminals:**
Depending on the device version, the terminals for screw, spring-type or ring lug terminal connection are configured for the main and auxiliary circuit.

A sealable transparent cover can be optionally mounted (accessory). It secures the motor current setting against adjustment.

3RU21 26-4FB00 thermal overload relays

Trip classes

The 3RU thermal overload relay is available for normal start-up conditions in CLASS 10. For further details about trip classes, see "Tripping characteristics".

Tripping characteristics

The tripping characteristics show the relationship between the tripping time and the tripping current as a multiple of the operational current I_e and are specified for symmetrical three-pole and two-pole loading from cold.

The smallest current at which tripping occurs is called the limiting tripping current. In accordance with IEC 60 947-4-1/DIN VDE 0660 Part 102, this must lie within certain specified limits. The limits of the limiting tripping current lie, in the case of the 3RU11 thermal overload re-

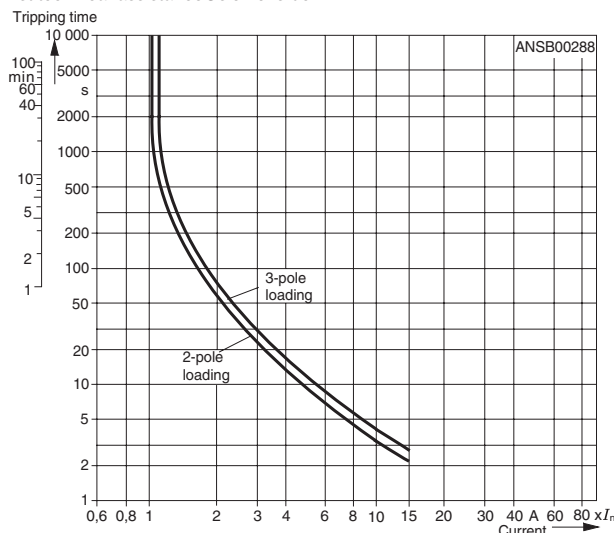
lay for symmetrical three-pole loading between 105 % and 120 % of the operational current. Starting from the limiting tripping current, the tripping characteristic moves on to larger tripping currents based on the characteristics of the so-called trip classes (CLASS 10, CLASS 20 etc.). The trip classes describe time-intervals within which the overload relay must trip with 7.2 times the operational current I_e for symmetrical three-pole loading from cold.

The tripping times are:

CLASS	Tripping times
10A	2 s to 10 s
10	4 s to 10 s
20	6 s to 20 s
30	9 s to 30 s

Description

This is the schematic representation of a characteristic. The characteristics of the individual 3RU thermal overload relays can be requested from Technical Assistance at the e-mail address: nst.technical-assistance@siemens.de



The tripping characteristic of a three-pole 3RU thermal overload relay (see characteristic for symmetrical three-pole loading from cold) is valid when all three bimetal strips are loaded with the same current simultaneously. If, however, only two bimetal strips are heated as a result of phase failure, these two strips would have to provide the force necessary for operating the release mechanism and, if no additional measures were implemented, they would require a longer tripping time or a higher current. These increased current levels over long periods usually result in damage to the consumer. To prevent damage, the 3RU thermal overload relay features phase failure sensitivity which, thanks to an appropriate mechanical mechanism, results in accelerated tripping according to the characteristic for two-pole loading from cold.

In contrast to a load in the cold state, a load at operating temperature has a lower heat reserve. This fact affects the 3RU thermal overload relay in that following an extended period of loading at operational current I_n , the tripping time reduces by about a quarter.

Phase failure protection

The 3RU thermal overload relays feature phase failure protection (see "Tripping characteristics") for the purpose of minimizing the heating of the load during single-phase operation as a result of phase failure.

Setting

The 3RU thermal overload relay is adjusted to the rated motor current using a rotary knob. The scale of the rotary knob is calibrated in Amperes.

Manual and automatic resetting

It is possible to switch between manual resetting and automatic resetting by depressing and rotating the blue button (RESET button). When manual resetting is selected, a reset can be performed directly on the device by pressing the RESET button. Remote resetting can be implemented by using the mechanical and electrical RESET modules from the range of accessories (see "Accessories"). When the blue button is set to Automatic RESET, the relay will be reset automatically.

A reset is not possible until the recovery time has elapsed (see "Recovery time").

Recovery time

After tripping due to an overload, it takes a certain length of time for the bimetal strips of the 3RU thermal overload relays to cool down. The relay can only be reset once it has cooled down. This time (recovery time) is dependent on the tripping characteristic and the level of the tripping current.

After tripping due to overload, the recovery time allows the load to cool down.

TEST function

Correct functioning of the ready 3RU thermal overload relay can be tested with the TEST slide. The slide is operated to simulate tripping of the relay. During this simulation, the NC contact (95-96) is opened and the NO contact (97-98) is closed whereby the overload relay checks that the auxiliary circuit is wired correctly. When the 3RU thermal overload relay is set to Automatic RESET, an automatic reset takes place when the TEST slide is released. The relay must be reset using the RESET button when it is set to Manual RESET.

STOP function

When the STOP button is pressed, the NC contact is opened and the series-connected contactor and therefore the load is switched Off. The load is reconnected via the contactor when the STOP button is released.

Status indication

The current status of the 3RU thermal overload relay is indicated by the position of the marking on the "TEST function/switching position indicator" slide. The marking on the slide is on the left at the "O" mark following a trip due to overload or phase failure and at the "I" mark otherwise.

Auxiliary contacts

The 3RU thermal overload relay is equipped with an NO contact for the tripped signal and an NC contact for switching off the contactor.

Connection

All the 3RU thermal overload relays have screw terminals for the main and auxiliary circuits. Once the box terminals have been removed from the main conductor connections of the overload relays of size S3, it is possible to connect busbars.

Alternatively the devices are available with either spring loaded or with ring lug terminals on both the control and the main terminals. For details of various connection possibilities, see the "Technical data" and "Selection and ordering data".

Design and mounting

The 3RU thermal overload relays are suitable for direct mounting on the 3RT contactors. They can also be mounted as single units if the appropriate adapters are used. For details of the mounting possibilities, see the "Selection and ordering data" and the "Technical data".

Operation with frequency converters

The 3RU thermal overload relays are suitable for operation with frequency converters. Depending on the frequency of the converter, a current higher than the motor current may have to be set due to the occurrence of eddy currents and skin effects.

Environmental considerations

The devices are manufactured taking environmental considerations into account and comprise environmentally-friendly and recyclable materials.

Specifications

The 3RU thermal overload relays comply with the requirements of:

- IEC 60 947-1/
DIN VDE 0660 Part 100
- IEC 60 947-4-1/
DIN VDE 0660 Part 102
- IEC 60 947-5-1/
DIN VDE 0660 Part 200
- IEC 60801-2, -3, -4, -5 and
- UL 508/CSA C 22.2.

The 3RU11 thermal overload relays are also safe from touch according to DIN VDE 0106 Part 100 and climate-proof to IEC 721.

Degree of protection "Increased safety" EEx

The 3RU thermal overload relay meets the requirements for overload protection of motors of the "Increased safety" type of protection EEx e IEC 50 019/ DIN VDE 0165, DIN VDE 0170, DIN VDE 171. KEMA test certificate number Ex-97.Y.3235, DMT 98 ATEX G001, EN 50 019: 1977 + A1 ... A5, Increased Safety "e": Appendix A, Guideline for temperature monitoring of squirrel cage motors during operation.

Accessories

For the 3RU thermal overload relay, there are:

- one adapter for each of the four overload relay sizes S00 to S3 for individual mounting
- one electrical remote RESET module for all sizes in three different voltage variants
- one mechanical remote RESET module for all sizes
- one cable release for all sizes for resetting inaccessible devices
- terminal covers

The accessories can also be used for the 3RB solid state overload relay.

Overload Relays

Thermal Overload Relays

3RU11, 3RU21 up to 100 A,
CLASS 10

• Revised •
04/20/15



Selection and ordering data

Features and technical characteristics

- Auxiliary contacts: 1 NO + 1 NC
- Manual/automatic RESET
- Switching position indication
- CLASS 10
- TEST function
- STOP button
- Phase failure sensitivity
- Sealable cover: optional in S00, S0 & S2. Integrated in S3

Ordering information

- Replace the (••) with the letter Number combination from the Terminal types I table
- Replace the (††) with the letter Number combination from the Terminal types II table
- For description, [see page 3/8](#)
- For technical data, [see pages 3/12-3/15](#)
- For circuit diagrams, [see page 3/15](#)
- For dimension drawings, [see page 3/16-3/17](#).

•• Terminal Types I			†† Terminal Types II		
Type	Mounting Type	Ltr	Type	Mounting Type	Ltr
Screw	Direct to Contactor	B0	Screw	Direct to Contactor	B0
Screw ¹⁾	Stand Alone	B1	Screw ⁴⁾	Stand Alone	B1
Spring ²⁾	Direct to Contactor	C0	Spring ³⁾	Direct to Contactor	D0
Spring ^{1) 2)}	Stand Alone	C1	Spring ^{3) 4)}	Stand Alone	D1
Ring Lug	Direct to Contactor	J0			



3RU2116-1GB0



3RU2116-1GC0



3RU2126-4NB0



3RU2136-4RB1



3RU1146-4DB0

Thermal Overload Relays up to 40A Frame Size S00 and S0 ••

Setting Range	Order No.	Setting Range	Order No.	Weight approx. (screw/spring) kg
A		A		
Frame Size S00: For mounting directly to 3RT201 contactors or for stand-alone installation				
0.11 - 0.16	3RU2116-0A••	1.4 - 2	3RU2116-1B••	0.13/0.15
0.14 - 0.2	3RU2116-0B••	1.8 - 2.5	3RU2116-1C••	
0.18 - 0.25	3RU2116-0C••	2.2 - 3.2	3RU2116-1D••	
0.22 - 0.32	3RU2116-0D••	2.8 - 4	3RU2116-1E••	
0.28 - 0.4	3RU2116-0E••	3.5 - 5	3RU2116-1F••	0.13/0.15
0.35 - 0.5	3RU2116-0F••	4.5 - 6.3	3RU2116-1G••	
0.45 - 0.63	3RU2116-0G••	5.5 - 8	3RU2116-1H••	
0.55 - 0.8	3RU2116-0H••	7 - 10	3RU2116-1J••	
0.7 - 1	3RU2116-0J••	9 - 12.5	3RU2116-1K••	0.13/0.15
0.9 - 1.25	3RU2116-0K••	11 - 16	3RU2116-4A••	
1.1 - 1.6	3RU2116-1A••			
Frame Size S0: For mounting directly to 3RT202 contactors or for stand-alone installation				
1.8 - 2.5	3RU2126-1C••	11 - 16	3RU2126-4A••	0.16/0.22
2.2 - 3.2	3RU2126-1D••	14 - 20	3RU2126-4B••	
2.8 - 4	3RU2126-1E••	17 - 22	3RU2126-4C••	
3.5 - 5	3RU2126-1F••	20 - 25	3RU2126-4D••	
4.5 - 6.3	3RU2126-1G••	23 - 28	3RU2126-4N••	0.16/0.22
5.5 - 8	3RU2126-1H••	27 - 32	3RU2126-4E••	
7 - 10	3RU2126-1J••	30 - 36	3RU2126-4P••	
9 - 12.5	3RU2126-1K••	34 - 40	3RU2126-4F••	

Thermal Overload Relays up to 100A Frame Size S2 and S3 ††

Setting Range	Order No.	Setting Range	Order No.	Weight approx. (screw/spring) kg
A		A		
Frame Size S2: For mounting directly to 3RT203 contactors ⁴⁾				
22 - 32	3RU2136-4E††	47 - 57	3RU2136-4Q††	0.34
28 - 40	3RU2136-4F††	54 - 65	3RU2136-4J††	
36 - 45	3RU2136-4G††	62 - 73	3RU2136-4K††	
40 - 50	3RU2136-4H††	70 - 80	3RU2136-4R††	
Frame Size S3: For mounting directly to 3RT104 contactors ⁴⁾				
18 - 25	3RU1146-4D††	45 - 63	3RU1146-4J††	0.55
22 - 32	3RU1146-4E††	57 - 75	3RU1146-4K††	
28 - 40	3RU1146-4F††	70 - 90	3RU1146-4L††	
36 - 50	3RU1146-4H††	80 - 100	3RU1146-4M††	

¹⁾ Not available for size S0 3RU212 with current setting range below 14 A.

²⁾ Size S00 and S0: main and auxiliary conductor terminals are spring-type.

³⁾ Size S2 and S3 auxiliary terminals are spring-type only. Main conductor terminals are screw.

⁴⁾ 3RU Overloads in S2 and S3 frame are available preassembled with a terminal bracket for standalone mounting. S2 and S3 overloads can also be customer assembled to the terminal bracket (see Accessories).

Accessories

Design		for type	Order No.	Weight approx kg	
		Size			
Terminal brackets for stand-alone installation ¹⁾					
	For separate mounting of the overload relay; panel mount or snapped onto 35 mm standard mounting rail, size S3 also for 75 mm standard mounting rail	Screw terminals	S00	3RU29 16-3AA01	0.04
			S0	3RU29 26-3AA01	0.05
			S2	3RU29 36-3AA01	0.18
			S3	3RU19 46-3AA01	0.28
		Spring Loaded terminals	S00	3RU29 16-3AC01	0.04
		S0	3RU29 26-3AC01	0.06	
3RU29 36-3AA01					
Mechanical RESET					
	Resetting plunger, holder, and former overload reset adapter	S00 to S2	3RU29 00-1A	0.038	
		S3	3RU19 00-1A	0.038	
	Pushbuttons with extended stroke IP 65 Ø 22 mm, 12 mm hub	S00 to S3	3SB3000-0EA11	0.020	
	Extension plungers For compensation of the distance between the pushbutton and the unlatching button of the relay	S00 to S3	3SX1 335	0.004	
	Complete mechanical reset assembly	S00 to S3	3SBES-RESET		
3RU19 00-1A with pushbutton, and reset extension					
Cable release with holder for RESET					
	For drilled hole Ø 6.5 mm in the control panel max. control panel thickness 8 mm	Length 400 mm	S00 to S2	3RU29 00-1B	0.063
		Length 600 mm	S00 to S2	3RU29 00-1C	0.073
		Length 400 mm	S3	3RU1900-1B	0.063
		Length 600 mm	S3	3RU1900-1C	0.073
3RU19 00-1					
Module for remote RESET, electrical					
	Operating range 0.85 to 1.1 × U _s Power consumption AC 80 VA, DC 70 W ON period 0.2 s to 4 s AC/DC 24 V to 30 V AC/DC 110 V to 127 V AC/DC 220 V to 250 V	S00 to S3	3RU19 00-2AB71 3RU19 00-2AF71 3RU19 00-2AM71	0.066 0.066 0.066	
3RU19 00-2A.71					
Terminal cover					
	Cover for cable lug and bar connection	S3	3RT19 46-4EA1	0.040	
	Cover for box terminals	S2	3RT29 36-4EA2	0.020	
		S3	3RT19 46-4EA2	0.025	
3RT1946-4EA1					
Sealable covers					
	For covering the rotary setting dials. Order in multiples of 10.	S00 to S2	3RV29 08-0P	0.100	
3RV29 08-0P					
Tool for opening Spring Loaded terminal connections					
	Suitable up to a For all SIRIUS devices with spring-type terminals		3RA2908-1A	0.045	
	• Length: approx. 200 mm; 3.0 × 0.5 mm (green)				
3RA2908-1A					

¹⁾ The accessories are identical to those of the 3RB30/3RB31 solid-state overload relays.

Overload Relays


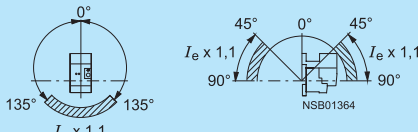
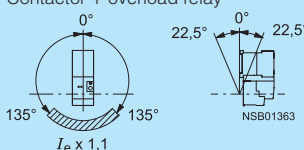
Thermal Overload Relays

3RU21 up to 100 A,
CLASS 10

• Revised •
10/18/15



Technical data

Type	3RU21 16		3RU21 26		3RU21 36		3RU11 46		
Size	S00		S0		S2		S3		
Width	45 mm		45 mm		55 mm		70 mm		
General data									
Release on			overload or phase failure						
Trip class		acc. to IEC 60947-4-1	CLASS 10	10, 10A			10		
Phase failure sensitivity			Yes						
Overload warning			No						
Resetting and recovery			Manual, remote and automatic RESET ¹⁾						
Reset possibilities after tripping		on automatic RESET	min	depending on the level of tripping current and the tripping characteristic					
Recovery time		on manual RESET	min	depending on the level of tripping current and the tripping characteristic					
		on remote RESET	min	depending on the level of tripping current and the tripping characteristic					
Features			Yes, using the slide "TEST function/ON-OFF indicator"						
Indication of status on the device			Yes						
TEST function			Yes						
RESET button			Yes						
STOP button			Yes						
Safe operation of motors with "increased safety" type of protection									
EC type test certificate number according to directive 94/9/EC (ATEX)			DMT 98 ATEX G 001  II (2) GD			On request			
Ambient temperatures									
Storage/transport		°C	-55 to +80			-55 to +80			
Operation		°C	-40 to +70			-40 to +70			
Temperature compensation		°C	up to +60			up to +60			
Permissible rated current at		Internal cabinet temperature of 60 °C	%	100 (over +60°C, the current must be reduced)			100 (over +60°C, current reduction is not required)		
		Internal cabinet temperature of 70 °C	%	87			87		
Repeat terminals									
Repeat coil terminal			Yes	Not required					
Auxiliary switch repeat terminal			Yes	Not required					
Degree of protection		acc. to IEC 60529	IP 20			IP 20 ²⁾			
Touch protection		acc. to IEC 61140	Finger-safe for vertical contact from the front Finger-safe only with optional terminal covers						
Shock resistance (sine)		acc. to IEC 60068-2-27	g/ms	15/11 (auxiliary contacts 95/96 and 97/98: 8g/11ms)			8/10		
EMC									
• Interference immunity			Not relevant						
• Emitted interference			Not relevant						
Resistance to extreme climates (humidity)			%	90			100		
Dimensions			see dimensional drawings						
Site altitude			m	Up to 2000; above this on request					
Installation angle			The permissible installation angles for mounting onto contactors and individual mounting are shown in the diagrams. For mounting in the shaded area, adjustment compensation of 10 % is necessary. Individual mounting  Contactor + overload relay 						
Type of installation/mounting			Mounting onto contactor/stand-alone installation with terminal support (For screw and snap-on mounting onto TH 35 standard mounting rail)			Direct mounting/stand-alone installation with terminal support (For screw and snap-on mounting onto TH34 standard mounting rail size; size S3 also for TH 75 standard mounting rail.*			

1) Remote RESET in combination with the appropriate accessories.

2) Terminal compartment: IP 00 degree of protection.

1) Remote RESET in combination with the appropriate accessories.

2) Terminal compartment: IP 00 degree of protection.



• Revised •
10/25/15

Overload Relays

Thermal Overload Relays

3RU21 up to 100 A,
CLASS 10

1

2

3

Technical data

Type	3RU21 16	3RU21 26	3RU21 36	3RU11 46
Size	S00	S0	S2	S3
Width	45 mm	45 mm	55 mm	70 mm

Main circuit

Rated insulation voltage U_i (pollution degree 3)		V	690			1000
Rated impulse withstand voltage U_{imp}		kV	6			8
Rated operational voltage U_e		V	690			1000
Type of current		DC AC	Yes Yes, frequency range up to 400 Hz			
Current setting		A	0.11 – 0.16 to 11 – 16	1.8 – 2.5 to 34 – 40	11-16 up to 70-80	18 – 25 to 80 – 100
Power loss per device (max.)		W	4.1...6.3	6.2...7.5	8...14	10 to 16.5
Short-circuit protection		With fuse without contactor With fuse and contactor	See selection and ordering data See technical data (short-circuit protection with fuses / circuit-breaker for motor feeders)			
Protective separation between main and auxiliary current paths		V				
Acc. to IEC 60947-1, • Screw terminals or ring terminal lug connections • Spring - type terminals			440 440	690: Setting ranges ≤ 25 A 440: Setting ranges > 25 A	690 690	690

Connection of the main circuit

Type of connection		Screw terminals			Screw connection with box terminal ²⁾ / bar connection
Screw terminals					
• Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	M6, Pozidriv size 2	Hexagon socket screw 4 mm
• Operating devices	mm	Ø5 ... 6	Ø5 ... 6	Ø5 ... 6	Ø5 ... 6
• Tightening torque	Nm	0.8 to 1.2	2 to 2.5	3 to 4.5	4 to 6
• Conductor cross-section (min./max.), 1 or 2 wires	Solid or stranded	mm ²	2 × (0.5 to 1.5), 2 × (0.75 to 2.5), max. 2 × 4	2 × (1 to 2.5), 2 × (2.5 to 6), max. 2 × (2.5 to 10)	2 × (2.5 to 16)
	Finely stranded with end sleeve	mm ²	2 × (0.5 to 1.5), 2 × (0.75 to 2.5)	2 × (1 to 2.5), 2 × (2.5 to 6) max. 1 × 10	2 × (2.5 to 35), 1 × (2.5 to 50)
	AWG conductor con., solid or stranded	AWG	2 × (20 ... 16) 2 × (18 ... 14) 2 × 12	2 × (16 ... 12) 2 × (14 ... 8)	2 × (10 to 1/0), 1 × (10 to 2/0)
	Ribbon cable (No. × width × thickness)	mm	–	–	2 × (6 × 9 × 0.8)
Bar connection					
• Terminal screw		–	–	–	M 6 × 20
• Tightening torque	Nm	–	–	–	4 to 6
• Conductor cross-section (min./max.)	Finely stranded with cable lug	mm ²	–	–	2 × 70
	Stranded with cable lug	mm ²	–	–	2 × 70
	AWG conductor connections, solid or stranded with cable lug	AWG	–	–	2/0
	With connecting bars (max. width)	mm	–	–	12

Auxiliary circuit

Main contacts: Number of NO contacts		1
Number of NC contacts		1
Assignment of auxiliary contacts		1 NO for the signal "tripped"; 1 NC for disconnecting the contactor
Rated insulation voltage U_i (pollution degree 3)	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Switching capacity of auxiliary contacts		
NC for AC	Rated operational current I_e at U_e :	
AC-14/AC-15	• 24 V	A 4
	• 120 V	A 4
	• 125 V	A 4
	• 230 V	A 3
	• 400 V	A 2
	• 600 V	A 0.75
	• 690 V	A 0.75

1) For conductor cross-sections for Cage Clamp terminals, see "Connection of the auxiliary circuit."

2) The box terminal can be removed. After the box terminal has been removed, bar connection and lug connection is possible.

Overload Relays

Thermal Overload Relays

3RU21 up to 100 A,
CLASS 10

• Revised •
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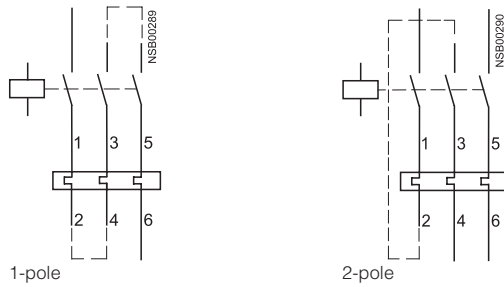
Technical data

Type			3RU21 16	3RU21 26	3RU21 36	3RU11 46
Size			S00	S0	S2	S3
Width			45 mm	45 mm	55 mm	70 mm
NO for AC AC-14/AC-15	Rated operational current I_e at U_e : <ul style="list-style-type: none">• 24 V• 120 V• 125 V• 230 V• 400 V• 600 V• 690 V	A	3			3
		A	3			3
		A	3			3
		A	2			2
		A	1			1
		A	0.75			0.6
		A	0.75			0.5
NC, NO for DC DC-13	Rated operational current I_e at U_e : <ul style="list-style-type: none">• 24 V• 60 V• 110 V• 125 V• 220 V	A	1			1
		A	On request			On request
		A	0.22			0.22
		A	0.22			0.22
		A	0.11			0.11
Conventional thermal current I_{th}		A	6			6
Contact reliability	(suitable for PLC; 17 V, 5 mA)		Yes			Yes
Short-circuit protection						
With fuse	Utilization cat. gL/gG fast	A	6			
		A	10			
With miniature circuit-breaker (C characteristic)		A	6 ¹⁾			
Reliable operational voltage for protective separation between auxiliary current paths acc. to IEC 60947-1		V	440			
Connection of the auxiliary circuit						
Type of connection			Screw terminal or Cage Clamp terminal			
Connection characteristics			Screw terminals			Cage Clamp terminals
<ul style="list-style-type: none">• Terminal screw• Tightening torque• Conductor cross-sections (min./max.), 1 or 2 wires	Solid or stranded	Nm	Pozidrive Size 2			–
		mm ²	0.8 to 1.2			2 × (0.25 to 2.5)
		mm ²	2 × (0.5 to 1.5), 2 × (0.75 to 2.5)			2 × (0.25 to 2.5)
		mm ²	–			2 × (0.25 to 2.5)
		mm ²	2 × (0.5 to 1.5), 2 × (0.75 to 2.5)			2 × (0.25 to 1.5)
		AWG	2 × (20 to 16) 2 × (18 to 14)			2 × (20 to 14)

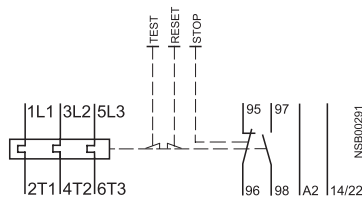
1) Up to $I_k \leq 0.5 \text{ kA}$; $\leq 260 \text{ V}$.

Circuit diagrams

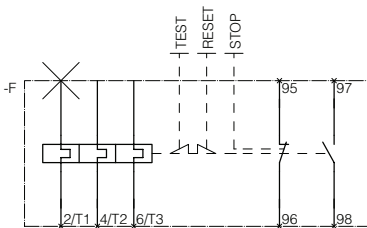
Protection of DC motors



3RU21 16 overload relay



3RU21 26 to 3RU11 46 overload relays



Overload Relays

Thermal Overload Relays

3RU21 up to 100 A,
CLASS 10

• Revised •
10/18/15



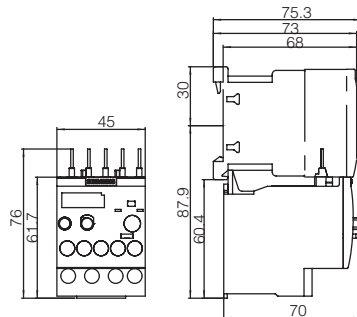
Dimension drawings

Screw connection

Lateral clearance to grounded components: at least 6 mm.

3RU21 16-..B0

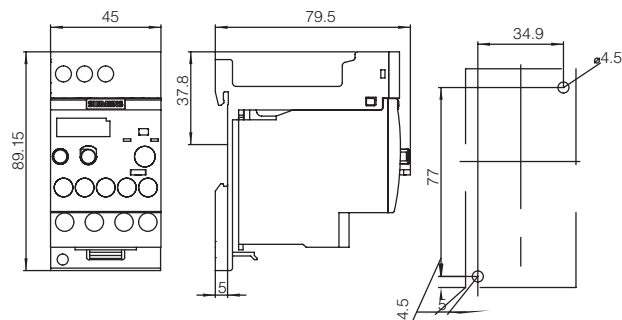
Size S00



3RU21 16-..B1

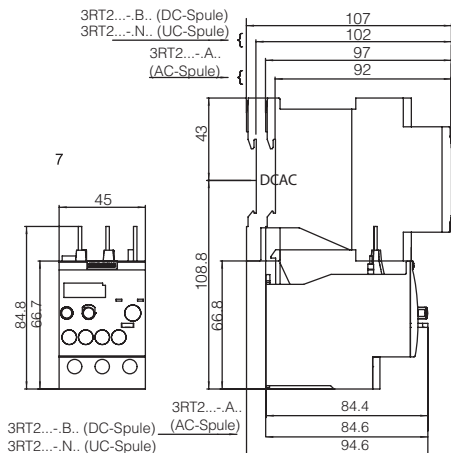
Size S00

with adapter for installation as a single unit with accessories



3RU21 26-..B.

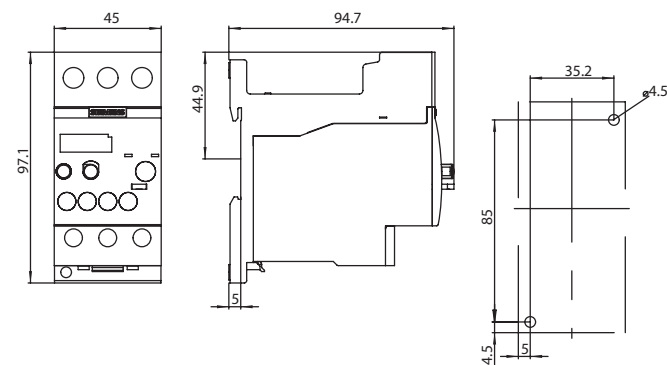
Size S0



3RU21 26-..B1

Size S0

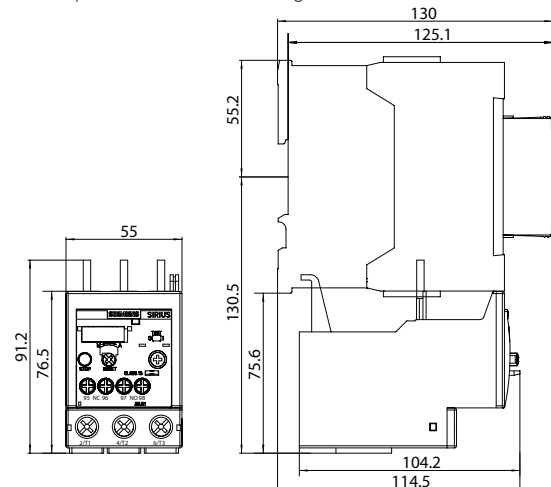
with adapter for installation as a single unit



3RU21 36-..B.

Size S2

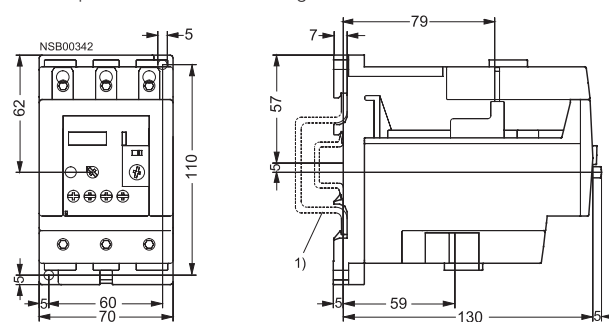
with adapter for installation as a single unit



3RU11 46-..B.

Size S3

with adapter for installation as a single unit



1) For mounting on 35 mm standard mounting rail
(15 mm deep) acc. to EN 50 022
or 75 mm standard mounting rail acc. to EN 50023

Dimension drawings "Contactor with built-on overload relay" see
contactors and contactor combinations.

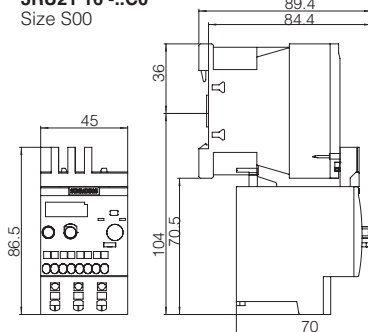
Dimension drawings

Spring Loaded terminals

Lateral clearance to grounded components: at least 6 mm.

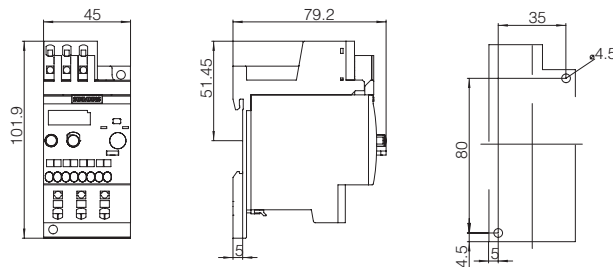
3RU21 16 -..C0

Size S00



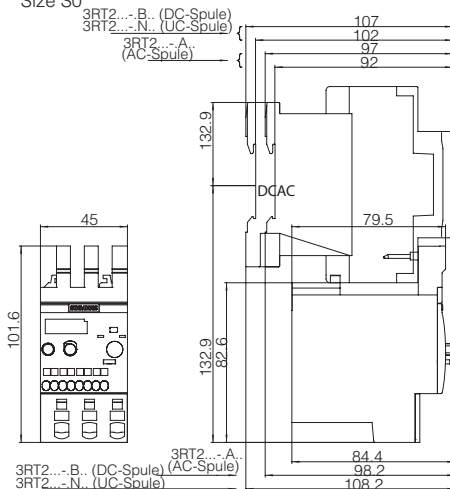
3RU21 16 -..C1

Size S00 with adapter for installation as a single unit



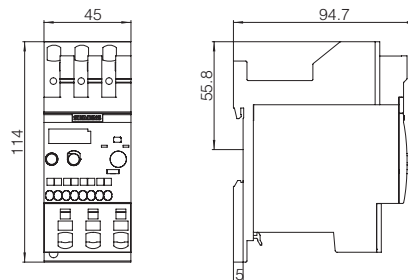
3RU21 26-..C0

Size S0



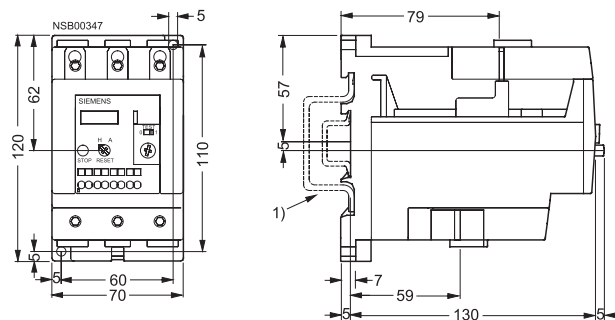
3RU21 26-..C1

Size S0 with adapter for installation as a single unit



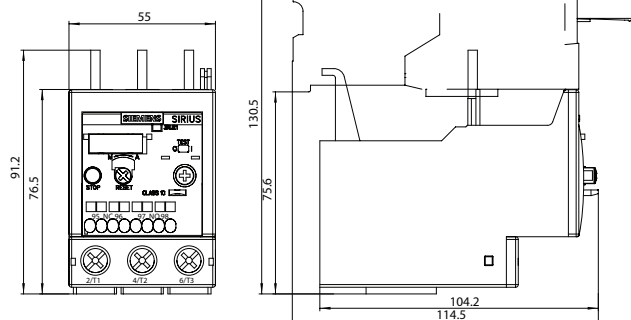
3RU11 46-..D.

Size S3



3RU2136-..D.

Size S2



- 1) For mounting on 35 mm standard mounting rail
(15 mm deep) acc. to EN 50 022
or 75 mm standard mounting rail acc. to EN 50 023

Dimension drawings "Contactor with built-on overload relay" see contactors
and contactor combinations.

Overload Relays

3RB2 / 3RB3 Solid-State Overload Relays

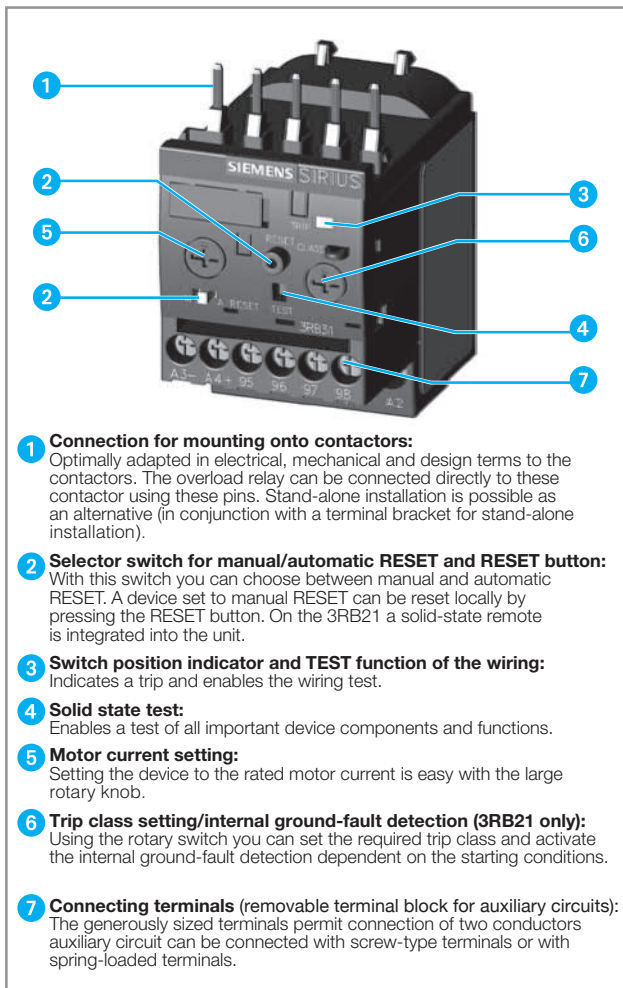
3RB20, 3RB21, 3RB30, 3RB31 up to 630A
for standard applications

• Revised •
04/20/15

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Overview



- 1 Connection for mounting onto contactors:**
Optimally adapted in electrical, mechanical and design terms to the contactors. The overload relay can be connected directly to these contactor using these pins. Stand-alone installation is possible as an alternative (in conjunction with a terminal bracket for stand-alone installation).
- 2 Selector switch for manual/automatic RESET and RESET button:**
With this switch you can choose between manual and automatic RESET. A device set to manual RESET can be reset locally by pressing the RESET button. On the 3RB21 a solid-state remote is integrated into the unit.
- 3 Switch position indicator and TEST function of the wiring:**
Indicates a trip and enables the wiring test.
- 4 Solid state test:**
Enables a test of all important device components and functions.
- 5 Motor current setting:**
Setting the device to the rated motor current is easy with the large rotary knob.
- 6 Trip class setting/internal ground-fault detection (3RB21 only):**
Using the rotary switch you can set the required trip class and activate the internal ground-fault detection dependent on the starting conditions.
- 7 Connecting terminals (removable terminal block for auxiliary circuits):**
The generously sized terminals permit connection of two conductors auxiliary circuit can be connected with screw-type terminals or with spring-loaded terminals.

The 3RB and 3RB solid-state overload relays up to 630 A with internal power supply have been designed for inverse-time delayed protection of loads with normal and heavy starting (see [Function](#)) against excessive temperature rise due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set motor rated current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding solid-state circuits which then output a pulse to the auxiliary contacts. The auxiliary contacts then switch off the load by means of the contactors control circuit. The break time depends on the ratio between the tripping current and set current I_e and is stored in the form of a long-term stable tripping characteristic (see [Characteristic Curves](#)).

In addition to inverse-time delayed protection of loads against excessive temperature rise due to overload, phase unbalance and phase failure, the 3RB21/31 solid-state overload relays also allow internal ground-fault detection (not possible in conjunction with wye-delta assemblies). This provides protection of loads against high-resistance short-circuits due to damage to the insulation material, moisture, condensed water etc.

The "tripped" status is signaled by means of a switch position indicator (see [Function](#)). Resetting takes place either manually or automatically after the recovery time has elapsed (see [Function](#)).

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials. They comply with important worldwide standards and approvals.

Application

Industries

The 3RB2 / 3RB3 solid-state overload relays are suitable for customers from all industries who want to provide optimum inverse-time delayed protection of their electrical loads (e.g. motors) under normal and heavy starting conditions (CLASS 5 to CLASS 30), minimize project completion times, inventories and power consumption, and optimize plant availability and maintenance management.

Application

The 3RB2 / 3RB3 solid-state overload relays have been designed for the protection of three-phase motors in sinusoidal 50/60 Hz voltage networks. The relays are not suitable for the protection of single-phase AC or DC loads.

The 3RU thermal overload relay or the 3RB22/3RB23 solid-state overload relay can be used for single-phase AC loads. For DC loads the 3RU thermal overload relays are available.

Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive environments, ageing and temperature changes.

For the temperature range from -25°C to $+60^{\circ}\text{C}$, the 3RB2 / 3RB3 solid-state overload relays compensate the temperature according to IEC 60947-4-1.

The 3RB2 / 3RB3 solid-state overload relays are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e according to ATEX guideline 94/9/EC. The relays meet the requirements of EN 60079-7 (Electrical apparatus for potentially explosive atmospheres – Increased safety "e").

The basic safety and health requirements of ATEX guideline 94/9/EG are fulfilled by compliance with

- EN 60947-1
- EN 60947-4-1
- EN 60947-5-1
- EN 60079-14

EU type test certificate for Group II, Category (2) G/D under application. It has the number PTB 09 ATEX 3001.

Accessories

The following accessories are available for the 3RB2/3RB3 solid-state overload relays:

- One terminal bracket each for the overload relays size S00 and S0 (sizes S2 to S12 can be installed as single units without a terminal bracket)
- One mechanical remote RESET module for all sizes
- One cable release for resetting devices which are difficult to access (for all sizes)
- One sealable cover for all sizes
- Box terminals for sizes S6 and S10/S12
- Terminal covers for sizes S2 to S10/S12

**Design****Device concept**

The 3RB2 / 3RB3 solid-state overload relays are compact devices, i.e. current measurement (transformer) and the evaluation unit are integrated in a single enclosure.

Mounting options

The 3RB2 / 3RB3 solid-state overload relays are suitable for direct and space-saving mounting onto 3RT1 / 3RT2 contactors and 3RW30/3RW31 soft starters as well as for stand-alone installation. For more information on the mounting options, please see [Technical Specifications and Selection and Ordering Data](#).

Connection techniqueMain circuit

All sizes of the 3RB2 / 3RB3 solid-state overload relays can be connected with screw-type terminals. As an alternative for sizes S3 to S10/S12, the main circuits can be connected via the Busbar. Sizes S2 to S6 of the 3RB20/3RB21 relays are also available with a straight-through transformer. In this case, the cables of the main circuit are routed directly through the feed-through openings of the relay to the contactor terminals.

Auxiliary circuit

Connection of the auxiliary circuit (removable terminal block) is possible with either screw terminals or spring-loaded terminals.

For more information on the connection options, see [Technical Specifications and Selection and Ordering Data](#).

Overload relays in contactor assemblies for Wye-Delta starting

When overload relays are used in combination with contactor assemblies for Wye-Delta starting it must be noted that only 0.58 times the motor current flows through the line contactor. An overload relay mounted onto the line contactor must be set to 0.58 times the motor current.

When 3RB21 / 31 solid-state overload relays are used in combination with contactor assemblies for Wye-Delta starting, the internal ground-fault detection must not be activated.

Operation with frequency converter

The 3RB2 / 3RB3 solid-state overload relays are suitable for frequencies of 50/60 Hz and the associated harmonics. This permits the 3RB2 / 3RB3 overload relays to be used on the incoming side of the frequency converter.

If motor protection is required on the outgoing side of the frequency converter, the 3RN thermistor motor protection devices or the 3RU thermal overload relays are available for this purpose.

Overload Relays

3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A
for standard applications



Function

Basic functions

The 3RB2 / 3RB3 solid-state overload relays are designed for:

- Inverse-time delayed protection of loads from overloading
- Inverse-time delayed protection of loads from phase unbalance
- Inverse-time delayed protection of loads from phase failure
- Protection of loads from high-resistance short-circuits (internal ground-fault detection only with 3RB21 / 31).

Control circuit

The 3RB2 / 3RB3 solid-state overload relays have an internal power supply, i.e. no additional supply voltage is required.

Short-circuit protection

Fuses or motor starter protectors must be used for short-circuit protection. For assignments of the corresponding short-circuit protection devices to the 3RB2 / 3RB3 solid-state overload relays with/without contactor [see Technical Specifications and Selection and Ordering Data](#).

Trip classes

The 3RB20 / 30 solid-state overload relays are available for normal starting conditions with trip CLASS 10 or for heavy starting conditions with trip CLASS 20 (fixed setting in each case).

The 3RB21 / 31 solid-state overload relays are suitable for normal and heavy starting. The required trip class (CLASS 5, 10, 20 or 30) can be adjusted by means of a rotary knob depending on the current starting condition.

For details of the trip classes [see Characteristic Curves](#).

Phase failure protection

The 3RB2 / 3RB3 solid-state overload relays are fitted with phase failure protection ([see Characteristic Curves](#)) in order to minimize temperature rise of the load during single-phase operation.

Phase failure protection is not effective for loads with star-connection and a grounded neutral point or a neutral point which is connected to a neutral conductor.

Setting

The 3RB2 / 3RB3 solid-state overload relays are set to the motor rated current by means of a rotary knob. The scale of the rotary knob is shown in amps.

With the 3RB21 / 31 solid-state overload relay it is also possible to select the trip class (CLASS 5, 10, 20 or 30) using a second rotary knob and to switch the internal ground-fault detection on and off.

Manual and automatic reset

In the case of the 3RB2 / 3RB3 solid-state overload relays, a slide switch can be used to choose between automatic and manual resetting.

If manual reset is set, a reset can be carried out directly on the device after a trip by pressing the blue RESET button. Resetting is possible in combination with the mechanical reset options from the accessories range ([see Accessories](#)). As an alternative to the mechanical RESET options, the 3RB21 / 31 solid-state overload relays are equipped with an electrical remote RESET which may be utilized by applying a voltage of 24 V DC to the terminals A3 and A4.

If the slide switch is set to automatic RESET, the relay is reset automatically.

The time between tripping and resetting is determined by the recovery time.

Recovery time

With the 3RB2 / 3RB3 solid-state overload relays the recovery time after inverse-time delayed tripping is between 0.5 and 3 minutes depending on the preloading when automatic RESET is set. These recovery times allow the load (e.g. motor) to cool down.

If the button is set to manual RESET, the 3RB2 / 3RB3 devices can be reset immediately after inverse-time delayed tripping.

After a ground fault trip the 3RB21 / 31 solid-state overload relays (with ground-fault detection activated) can be reset immediately without a recovery time regardless of the reset mode set.

TEST function

With motor current flowing, the TEST button can be used to check whether the relay is working correctly (device/solid-state TEST). Current measurement, motor model and trip unit are tested. If these components are OK, the device is tripped in accordance with the table below. If there is an error, no tripping takes place.

Trip class	Required loading with the rated current prior to pressing the test button	Tripping within
CLASS 5	2 min	8 s
CLASS 10	4 min	15 s
CLASS 20	8 min	30 s
CLASS 30	12 min	45 s

Note: The test button must be kept pressed throughout the test.

Testing of the auxiliary contacts and the control current wiring is possible with the switch position indicator slide. Actuating the slide simulates tripping of the relay. During this simulation the NC contact (95-96) is opened and the NO contact (97-98) is closed. This tests whether the auxiliary circuit has been correctly wired.

After a test trip the relay is reset by pressing the RESET button.

Self-monitoring

The 3RB2 / 3RB3 solid-state overload relays have a self-monitoring feature, i.e. the devices constantly monitor their own basic functions and trip if an internal fault is detected.

Display of operating status

The respective operating status of the 3RB2 / 3RB3 solid-state overload relays is displayed by means of the position of the marking on the switch position indicator slide. After tripping due to overload, phase failure, phase unbalance or ground fault (ground fault detection possible only with 3RB21 / 31) the marking on the slide is to the left on the "O" mark, otherwise it is on the "I" mark.

Auxiliary contacts

The 3RB2 / 3RB3 solid-state overload relays are fitted with an NO contact for the "tripped" signal, and an NC contact for switching off the contactor.

Selection and ordering data

Conversion aid 3RB10 or 3RB20 → 3RB20 or 30

Size	Old Order No.	Setting range A	New Order No.	Setting range A
S00	3RB20 16-□RB0	0.1 ... 0.4	3RB30 16-□RB0	0.1 ... 0.4
	3RB20 16-□NB0	0.32 ... 1.25	3RB30 16-□NB0	0.32 ... 1.25
	3RB20 16-□PB0	1 ... 4	3RB30 16-□PB0	1 ... 4
	3RB20 16-□SB0	3 ... 12	3RB30 16-□SB0	3 ... 12
S0	3RB20 26-□RB0	0.1 ... 0.4	3RB30 26-□RB0	0.1 ... 0.4
	3RB20 26-□NB0	0.32 ... 1.25	3RB30 26-□NB0	0.32 ... 1.25
	3RB20 26-□PB0	1 ... 4	3RB30 36-□PB0	1 ... 4
	3RB20 26-□SB0	3 ... 12	3RB30 26-□SB0	3 ... 12
	3RB20 26-□QB0	6 ... 25	3RB30 26-□QB0	6 ... 25
S2	3RB20 36-□QB0	6 ... 25	3RB30 36-□UB0	12 ... 80
	3RB20 36-□UB0	13 ... 50	3RB30 36-□UB0	12 ... 80
S3	3RB10 46-□UB0	13 ... 50	3RB20 46-□UB0	12.5 ... 50
	3RB10 46-□EB0	25 ... 100	3RB20 46-□EB0	25 ... 100
S6	3RB10 56-□FW0	50 ... 200	3RB20 56-□FW2	50 ... 200
	3RB10 56-□FG0	50 ... 200	3RB20 56-□FC2	50 ... 200
S10/S12	3RB10 66-□GG0	55 ... 250	3RB20 66-□GC2	55 ... 250
	3RB10 66-□KG0	200 ... 540		
	3RB10 66-□LG0	300 ... 630	3RB20 66-□MC2	160 ... 630

CLASS 10
CLASS 20

1
2

1
2

Conversion aid 3RB10 / 21 → 3RB21 / 31

Size	Old Order No.	Setting range A	New Order No.	Setting range A
S00	3RB21 13-□RB0	0.1 ... 0.4	3RB31 13-4RB0	0.1 ... 0.4
	3RB21 13-□NB0	0.4 ... 1.6	3RB31 13-4NB0	0.32 ... 1.25
	3RB21 13-□PB0	1.5 ... 6	3RB31 13-4PB0	1 ... 4
	3RB21 13-□SB0	3 ... 12	3RB31 13-4SB0	3 ... 12
S0	3RB21 23-□RB0	0.1 ... 0.4	3RB31 23-RB0	0.1 ... 0.4
	3RB21 23-□NB0	0.32 ... 1.25	3RB31 23-NB0	0.32 ... 1.25
	3RB21 23-□PB0	1 ... 4	3RB31 23-PB0	1 ... 4
	3RB21 23-□SB0	3 ... 12	3RB31 23-4SB0	3 ... 12
	3RB21 23-□QB0	6 ... 25	3RB31 23-4QB0	6 ... 25
S2	3RB21 33-□QB0	6 ... 25	3RB31 33-4UB0	12 ... 80
	3RB21 33-□UB0	13 ... 50	3RB31 33-4UB0	12 ... 80
S3	3RB10 46-□UB0	12.5 ... 50	3RB21 43-4UB0	12.5 ... 50
	3RB10 46-□EB0	25 ... 100	3RB21 43-4EB0	25 ... 100
S6	3RB10 56-□FW0	50 ... 200	3RB21 53-4FW2	50 ... 200
	3RB10 56-□FG0	50 ... 200	3RB21 53-4FC2	50 ... 200
S10/S12	3RB10 66-□GG0	55 ... 250	3RB21 63-4GC2	55 ... 250
	3RB10 66-□KG0	200 ... 540		
	3RB10 66-□LG0	300 ... 630	3RB21 63-4MC2	160 ... 630

CLASS 10
CLASS 20

1
2

Note:

CLASS 5, 10, 20 and 30
can be set on the unit

Overload Relays

3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A
for standard applications

• Revised •
04/20/15







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3RB20 solid-state overload relays and stand-alone installation²⁾³⁾, CLASS 10 or CLASS 20 for direct mounting¹⁾²⁾

Features and technical specifications:

- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function and self-monitoring

Size Contactor ⁴⁾	Set current value of the inverse-time delayed overload trip	Screw Terminal Order Number	Spring Loaded Terminal Order Number	Weight per PU approx.	
	A			kg	
Size S00 ¹⁾					
	S00	0.1 ... 0.4	3RB30 16-□RB0	0.172	
		0.32 ... 1.25	3RB30 16-□NB0	0.172	
		1 ... 4	3RB30 16-□PB0	0.172	
		3 ... 12	3RB30 16-□SB0	0.172	
		4 ... 16	3RB30 16-□TB0	0.172	
Size S0 ¹⁾					
	S0	0.1 ... 0.4	3RB30 26-□RB0	0.250	
		0.32 ... 1.25	3RB30 26-□NB0	0.250	
		1 ... 4	3RB30 26-□PB0	0.250	
		3 ... 12	3RB30 26-□SB0	0.250	
		6 ... 25	3RB30 26-□QB0	0.250	
	10 ... 40	3RB30 26-□VB0	3RB30 26-□VE0	0.250	
Size S2 ¹⁾³⁾⁵⁾					
	S2	12 ... 50	with busbar	3RB30 36-□UB0	0.360
			with pass through CT's	3RB30 36-□UW1	0.230
		20 ... 80	with busbar	3RB30 36-□WB0	0.360
			with pass through CT's	3RB30 36-□WW1	0.230
Size S3 ¹⁾³⁾⁵⁾					
	S3	12.5 ... 50	with busbar	3RB20 46-□UB0	0.560
		25 ... 100	with busbar	3RB20 46-□EB0	0.560
			with pass through CT's	3RB20 46-□EW1	0.450
Size S6 ²⁾⁵⁾					
	S6	50 ... 200	with busbar	3RB20 56-□FC2	1.030
			with pass through CT's	3RB20 56-□FW2	0.690
Size S10/S12 ²⁾					
	S10/S12 and size 14 (3TF68/3TF69)	55 ... 250	with busbar	3RB20 66-□GC2	1.820
		160 ... 630	with busbar	3RB20 66-□MC2	1.820
		2 Class 20	2 Class 20		
		1 Class 10	1 Class 10		

1) The relays with an Order No. ending with "0" are designed for direct mounting to the contactor. With the matching terminal brackets (see Accessories) the sizes S00 to S3 can also be installed as stand-alone units.

2) The relays with an Order No. ending with "2" are designed for direct mounting and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.

3) The relays with an Order No. ending with "1" are designed for stand-alone installation.

4) Observe maximum rated operational current of the devices.

5) The relays with an Order No. with "X" in 10th position are equipped with a straight-through transformer.

For accessories, see pages 3/49-3/50.

For description, see pages 3/18-3/20.

For technical data, see pages 3/24-3/29.







For dimension drawings, see page 3/30.

For schematic diagrams, see page 3/31.

**3RB21 / 3RB31 solid-state overload relays for direct mounting¹⁾²⁾
and stand-alone installation²⁾³⁾, CLASS 5, 10, 20 and 30 adjustable**

Features and technical specifications:

- Overload protection, phase failure protection and unbalance protection
- Internal ground fault detection (activatable)
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Electrical remote RESET integrated
- Switch position indicator
- TEST function and self-monitoring

Size Contactor ⁴⁾	Set current value of the inverse-time delayed overload trip	Screw Terminal Order Number	Spring Loaded Terminal Order Number	Weight per PU approx.	
	A			kg	
Size S00 ¹⁾					
	S00	0.1 ... 0.4	3RB31 13-4RB0	3RB31 13-4RE0	0.175
		0.32 ... 1.25	3RB31 13-4NB0	3RB31 13-4NE0	0.175
		1 ... 4	3RB31 13-4PB0	3RB31 13-4PE0	0.175
		3 ... 12	3RB31 13-4SB0	3RB31 13-4SE0	0.175
		4 ... 16	3RB31 13-4TB0	3RB31 13-4TE0	0.175
Size S0 ¹⁾					
	S0	0.1 ... 0.4	3RB31 23-4RB0	3RB31 23-4RE0	0.215
		0.32 ... 1.25	3RB31 23-4NB0	3RB31 23-4NE0	0.215
		1 ... 4	3RB31 23-4PB0	3RB31 23-4PE0	0.215
		3 ... 12	3RB31 23-4SB0	3RB31 23-4SE0	0.215
		6 ... 25	3RB31 23-4QB0	3RB31 23-4QE0	0.215
		10 ... 40	3RB31 23-4VB0	3RB31 23-4VE0	0.215
Size S2 ¹⁾³⁾⁵⁾					
	S2	12 ... 50	with busbar 3RB31 33-4UB0	3RB31 33-4UD0	0.360
			with pass through CT's 3RB31 33-4UW1	3RB31 33-4UX1	0.230
		20 ... 80	with busbar 3RB31 33-4WB0	3RB31 33-4WD0	0.360
			with pass through CT's 3RB31 33-4WW1	3RB31 33-4WX1	0.230
Size S3 ¹⁾³⁾⁵⁾					
	S3	12.5 ... 50	with busbar 3RB21 43-4UB0	3RB21 43-4QD0	0.560
		25 ... 100	with busbar 3RB21 43-4EB0	3RB21 43-4ED0	0.560
			with pass through CT's 3RB21 43-4EW1	3RB21 43-4EX1	0.450
Size S6 ²⁾⁵⁾					
	S6	50 ... 200	with busbar 3RB21 53-4FC2	3RB21 53-4FF2	1.030
			with pass through CT's 3RB21 53-4FW2	3RB21 53-4FX2	0.690
Size S10/S12 ²⁾					
	S10/S12 and size 14 (3TF68/ 3TF69)	55 ... 250	3RB21 63-4GC2	3RB21 63-4GF2	1.820
		160 ... 630	3RB21 63-4MC2	3RB21 63-4MF2	1.820

1) The relays with an Order No. ending with "0" are designed for direct mounting to the contactor. With the matching terminal brackets (see Accessories) the sizes S00 to S3 can also be installed as stand-alone units.

2) The relays with an Order No. ending with "2" are designed for direct mounting and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.

3) The relays with an Order No. ending with "1" are designed for stand-alone installation.

4) Observe maximum rated operational current of the devices.

5) The relays with an Order No. with "X" in 10th position are equipped with a straight-through transformer.

For accessories, see pages 3/49-3/50.

For description, see pages 3/18-3/21.

For technical data, see pages 3/24-3/29.

For dimension drawings, see page 3/30.

For schematic diagrams, see page 3/31.

Overload Relays

3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A
for standard applications

• Revised •
10/18/15



Technical specifications

Type		3RB30 16, 3RB31 13	3RB30 26, 3RB31 23	3RB30 36 3RB31 33	3RB20 46, 3RB21 43	3RB20 56, 3RB21 53	3RB20 66, 3RB21 63
Size		S00	S0	S2	S3	S6	S10/S12
Width		45 mm	45 mm	55 mm	70 mm	120 mm	145 mm
General data							
Trips in the event of		Overload, phase failure, and phase unbalance + ground fault (for 3RB31 only)					
Trip class according to IEC 60947-4-1		CLASS	3RB30: 10E, 20E; 3RB31: 5E, 10E, 20E or 30E adjustable				
Phase failure sensitivity		Yes					
Overload warning						No	
Reset and recovery							
• Reset options after tripping			Manual and automatic RESET, 3RB31 has an integrated connection for electrical remote RESET (24 V DC)			3RB20: Manual and automatic RESET; 3RB21: Manual, automatic and remote RESET	
• Recovery time		min.	Approx. 3 min			Approx. 3 min	
- For automatic RESET		min.	Immediately			Immediately	
- For manual RESET		min.	Immediately			Immediately	
- For remote RESET		min.	Immediately			Immediately	
Features							
• Display of operating status on device		Yes, by means of switch position indicator slide					
• TEST function		Yes, test of electronics by pressing the button Test Test of auxiliary contacts and wiring of control current circuit by actuating the switch position indicator slide/self-monitoring					
• RESET button		Yes					
• STOP button		No					
Explosion protection – Safe operation of motors with "Increased safety" type of protection		PTB 09 ATEX 3001 ⚡ II (2) G [Ex e] [Ex d] [Ex px] ⚡ II (2) G [Ex t] [Ex p]			On request	PTB 09 ATEX 3001 ⚡ II (2) G [Ex e] [Ex d] [Ex px] ⚡ II (2) G [Ex t] [Ex p]	
EC type test certificate number according to directive 94/9/EC (ATEX)							
Ambient temperatures							
• Storage/transport		°C	-40 ... +80				
• Operation		°C	-25 ... +60				
• Temperature compensation		°C	+60				
• Permissible rated current at							
- Temperature inside control cabinet 60 °C, stand-alone installation		%	—			100	100
- Temperature inside control cabinet 60 °C, mounted on contactor		%	100			100	100 or 90 ²⁾
- Temperature inside control cabinet 70 °C		%	On request			On request	70
Repeat terminals							
• Coil repeat terminal		Yes	Not required				
• Auxiliary contact repeat terminal		Yes	Not required				
Degree of protection according to IEC 60529		IP20				IP20 ³⁾	
Touch protection according to IEC 61140		Finger-safe for vertical contact from the front				Finger-safe, for busbar connection with cover	Finger-safe with cover
Shock resistance with sine according to IEC 60068-2-27 9/ms		15/11 (signaling contact 97/98 in position "tripped": 9g/ms)		15/11 (signaling contact 97/98 in "Tripped" position: 8 g/11ms)	15/11 (signaling contact 97/98 in position "tripped": 4 g/11ms)		
Electromagnetic compatibility (EMC) – Interference immunity							
• Conductor-related interference							
- Burst according to IEC 61000-4-4 (corresponds to degree of severity 3)		kV	2 (power ports), 1 (signal ports)				
- Surge according to IEC 61000-4-5 (corresponds to degree of severity 3)		kV	2 (line to earth), 1 (line to line)				
• Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)		kV	8 (air discharge), 6 (contact discharge)				
• Field-related interference according to IEC 61000-4-3 (corresponds to degree of severity 3)		V/m	10				
Electromagnetic compatibility (EMC) – Emitted interference		Degree of severity B according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)					
Resistance to extreme climates – air humidity		%	95			100	
Dimensions		See dimensional drawings					
Installation altitude above sea level		m	Up to 2000				
Mounting position		Any					
Type of mounting		Direct mounting/stand-alone installation with terminal support				Direct mounting / Stand-alone installation	

1) Permissible rated current in case of heavy starting
Size S0 at 10 A up to 40 A
- CLASS 20, I_e max = 32 A
- CLASS 30, I_e max = 25 A

2) 90 % for relay with current setting range 160A to 630A
3) Terminal compartment: degree of protection IP00.



• Revised •
10/25/15

Overload Relays

3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A
for standard applications

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3

Type		3RB30 16, 3RB31 13 S00 45 mm	3RB30 26, 3RB31 23 S0 45 mm	3RB30 36, 3RB31 33 S2 55 mm	3RB20 46, 3RB21 43 S3 70 mm
Size					
Width					
Main circuit					
Rated insulation voltage U_i (pollution degree 3)	V	690	690	690	1000
Rated impulse withstand voltage U_{imp}	kV	6	6	6/8	8
Rated operational voltage U_e	V	690	690	690	1000
Type of current		No			
• Direct current		Yes, 50/60 Hz ± 5%			
• Alternating current					
Set current	A	0.1 ... 0.4 to 4 ... 16	0.1 ... 0.4 to 10... 40	12.5 ... 50 and 20 to 80	12.5 ... 50 to 25 ... 100
Power loss per unit (max.)	W	0.05 ... 0.2			
Short-circuit protection		See Selection and Ordering Data See Technical Specifications (short-circuit protection with fuses for motor feeders)			
- With fuse without contactor					
- With fuse and contactor					
Protective separation between main and auxiliary conducting path according to IEC 60947-1 (pollution degree 2)	V	690 for grounded networks, otherwise 600 V			
Connection for main circuit					
Electrical connection version		Screw terminal	Screw terminal	Screw terminal	Screw terminal with box terminal /
Screw terminal					
• Terminal screw		M3, Pozidriv size 2	M3, Pozidriv size 2	M4, Pozidriv size 2	M8, 4 mm Allen screw
• Tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	2 ... 2.5	4 ... 6
• Conductor cross-sections (min./max.)					
- Solid or stranded	mm ²	2 × (0.5 ... 1.5) ³⁾ 2 × (0.75 ... 2.5) ³⁾ 2 × (0.05 ... 4) ³⁾	2 × (1 ... 2.5) ³⁾ 2 × (2.5 ... 10)	1 × (1 ... 50) 2 × (1 ... 35) (Solid or Stranded)	2 × (2.5 ... 16)
- Finely stranded with end sleeve (DIN 46228 T1)	mm ²	2 × (0.5 ... 1.5) ³⁾ 2 × (0.75 ... 2.5) ³⁾	2 × (1 ... 2.5) ³⁾ 2 × (2.5 ... 6) ³⁾ max. 1 x 10	2 × (1 ... 25), 1 × (1 ... 35)	2 × (2.5 ... 35), 1 × (2.5 ... 50)
- Stranded	mm ²	--			2 × (10 ... 50), 1 × (10 ... 70)
- AWG cables, solid or stranded	AWG	2 × (20 ... 16) ³⁾ 2 × (18 ... 14) ³⁾ 2 × 12	2 × (16 ... 12) ³⁾ 2 × (14 ... 8) ³⁾	2 × (18 ... 2) 1 × (18 ... 1)	2 × (10 ... 1/0), 2 × (10 ... 2/0)
- Ribbon cable conductors (number x width x circumference)	mm	--			2 × (6 × 9 × 0.8)
Busbar connections					
• Terminal screw		--			M 6 × 20
• Tightening torque	Nm	--			4 ... 6
• Conductor cross-section (min./max.)					
- Finely stranded with cable lug	mm ²	--			2 × 70
- Stranded with cable lug	mm ²	--			3 × 70
- AWG connections, solid or stranded, with cable lug	AWG	--			2/0
- With connecting bar (max. width)	mm	--			12
Straight-through transformers					
• Diameter of opening	mm	–		15	18

1) For version with straight-through transformer up to 1000 VAC.
2) For version with straight-through transformer up to 8 kV.

3) If two different conductor cross-sections are connected
to one clamping point, both cross-sections must lie in
the range specified.

Overload Relays

3RB2 /3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A
for standard applications

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Type	3RB20 56, 3RB21 53	3RB20 66, 3RB21 63
Size	S6	S10/S12
Width	120 mm	145 mm
Main circuit		
Rated insulation voltage U_i (pollution degree 3)	V	1000
Rated impulse withstand voltage U_{imp}	kV	8
Rated operational voltage U_e	V	1000
Type of current	No Yes, 50/60 Hz \pm 5 (other frequencies on request)	
• Direct current		
• Alternating current		
Set current	A	50 ... 200 55 ... 250 to 160 ... 630
Power loss per unit (max.)	W	0.05
Short-circuit protection	See Selection and Ordering Data See Technical Specifications (short-circuit protection with fuses for motor feeders)	
- With fuse without contactor		
- With fuse and contactor		
Safe isolation between main and auxiliary conducting path according to IEC 60947-1	V	690 ¹⁾
Connection for main circuit		
Electrical connection version	Screw terminal with box terminal/ Bus connection / Straight-through transformer	Screw terminal with box terminal/ Bus connection
Screw terminal		
• Terminal screw	4 mm Allen screw	5 mm Allen screw
• Tightening torque	Nm 10 ... 12	20 ... 22
• Conductor cross-sections (min./max.), 1 or 2 conductors		
- Solid	mm ²	--
- Finely stranded without end sleeve	mm ²	2 × (50 ... 185), front clamping point only: 1 × (70 ... 240) rear clamping point only: 1 × (120 ... 185)
- Finely stranded with end sleeve	mm ²	2 × (50 ... 185), front clamping point only: 1 × (70 ... 240) rear clamping point only: 1 × (120 ... 185)
- Stranded	mm ²	2 × (70 ... 240), front clamping point only: 1 × (95 ... 300) rear clamping point only: 1 × (120 ... 240)
- AWG conductors, solid or stranded	AWG	2 × (2/0 ... 500 kcmil), front clamping point only: 1 × (3/0 ... 600 kcmil) rear clamping point only: 1 × (250 kcmil ... 500 kcmil)
- Ribbon cable conductors (number x width x circumference)	mm	2 × (20 × 24 × 0.5), 1 × (6 × 9 × 0.8 ... 20 × 24 × 0.5)
Busbar connections		
• Terminal screw	M 8 × 25	M 10 × 30
• Tightening torque	Nm 10 ... 14	14 ... 24
• Conductor cross-section (min./max.)		
- Finely stranded with cable lug	mm ²	16 ... 95 ²⁾
- Stranded with cable lug	mm ²	25 ... 120 ²⁾
- AWG connections, solid or stranded, with cable lug	AWG	4 ... 250 kcmil
- With connecting bar (max. width)	mm	15
Straight-through transformers		
• Diameter of opening	mm	24.5
• Conductor cross-section (max.)		
- NYY	mm ²	120
- H07RN-F	mm ²	70

1) For grounded networks, otherwise 600 V.

2) When connecting cable lugs according to DIN 46235, use the 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm² to ensure phase spacing.

3) When connecting cable lugs according to DIN 46234 for conductor cross-sections from 240 mm² as well as DIN 46235 for conductor cross-sections from 185 mm², use the 3RT19 56-4EA1 terminal cover to ensure phase spacing.



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Overload Relays

3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A
for standard applications

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3

Type		3RB30 16, 3RB31 13	3RB30 26, 3RB31 23	3RB30 36, 3RB31 33	3RB20 46, 3RB21 43	3RB20 56, 3RB21 53	3RB20 66, 3RB21 63
Size		S00	S0	S2	S3	S6	S10/S12
Width		45 mm	45 mm	55 mm	70 mm	120 mm	145 mm
Auxiliary circuit							
Number of NO contacts		1					
Number of NC contacts		1					
Auxiliary contacts – assignment		1 NO for the signal "tripped", 1 NC for switching off the contactor					
Rated insulation voltage U_i (pollution degree 3)	V	300					
Rated impulse withstand voltage U_{imp}	kV	4					
Auxiliary contacts – Contact rating							
• NC contact with alternating current AC-14/AC-15 Rated operational current I_e at U_e :							
- 24 V	A	4					
- 120 V	A	4					
- 125 V	A	4					
- 250 V	A	3					
• NO contact with alternating current AC-14/AC-15: Rated operational current I_e at U_e :							
- 24 V	A	4					
- 120 V	A	4					
- 125 V	A	4					
- 250 V	A	3					
• NC, NO contact with direct current DC-13: Rated operational current I_e at U_e :		1)					
- 24 V	A	2					
- 60 V	A	0.55					
- 110 V	A	0.3					
- 125 V	A	0.3					
- 250 V	A	0.11					
• Continuous thermal current I_{th}	A	5					
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes					
Short-circuit protection							
• With fuse - gL/gG operational class	A	6					
Ground-fault protection (only 3RB31)							
• Tripping value I_{Δ}		The information refers to sinusoidal residual currents at 50/60 Hz. > $0.75 \times I_{motor}$					
• Operating range I		Lower current setting value < I_{motor} < $3.5 \times$ upper current setting value					
• Response time t_{trip} (in steady-state condition)	s	< 1					
Integrated electrical remote RESET (only 3RB31)							
Connecting terminals A3, A4		24 V DC, max. 200 mA for approx. 20 ms, then < 10 mA					
Protective separation between main and auxiliary conducting path according to IEC 60947-1	V	300					
CSA, UL, and UR rated data							
Auxiliary circuit – switching capacity							
		3RB30: B600, R300 3RB31: B300, R300			B300, R300		
Connection of the auxiliary circuit							
Connection type							
Screw terminal or spring-loaded terminals							
Screw terminal							
• Terminal screw		Pozidriv size 2					
• Tightening torque	Nm	0.8 ... 1.2					
• Conductor cross-sections (min./max.), 1 or 2 conductors							
- Solid or stranded	mm ²	1 × (0.5 ... 4), 2 × (0.5 ... 2.5)					
- Finely stranded with end sleeve	mm ²	1 × (0.5 ... 2.5), 2 × (0.5 ... 1.5)					
- AWG conductors, solid or stranded	AWG	2 × (20 ... 14)					
Spring-loaded terminals							
• Conductor cross-sections (min./max.), 1 or 2 conductors							
- Solid	mm ²	2 × (0.25 ... 1.5)					
- Finely stranded without end sleeve	mm ²	--					
- Finely stranded with end sleeve	mm ²	2 × (0.25 ... 1.5)					
- Stranded	mm ²	2 × (0.25 ... 1.5)					
- AWG conductors, solid or stranded	AWG	2 × (24 ... 16)					

Overload Relays

3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A
for standard applications

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Short-circuit protection with fuses for motor starters

For short-circuit currents up to 50 kA at 400 to 690 V

Overload relays	Contactor	CLASS									690 V	
		5 and 10			20			30			Fuse links ¹⁾	
											LV HRC Type 3NA DIAZED Type 5SB NEOZED Type 5SE gL/gG operational class Type of coordination ²⁾	
Setting range	Type	Rated operational current I_e			AC-3 in A at							
		400 V	500 V	690 V	400 V	500 V	690 V	400 V	500 V	690 V	1	2
Size S00												
0.1 ... 0.4 A	3RT20 15	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	35	4
0.32 ... 1.25 A	3RT20 15	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	35	6
1 ... 4 A	3RT20 15	4	4	4	4	4	4	4	4	4	35	20
	3RT20 16	4	4	4	4	4	4	4	4	4	35	20
	3RT20 17	4	4	4	4	4	4	4	4	4	35	20
4 ... 16 A	3RT20 16	9	6.5	5.2	9	6.5	5.2	9	6.5	5.2	35	20
	3RT20 17	12	9	6.3	10	9	6.3	9	9	6.3	35	20
	3RT20 18	16	12.4	8.9	12.9	11.6	8.1	11.6	11.6	8.1	50	25
Size S0												
3 ... 12 A	3RT20 23	9	6.5	5.2	9	6.5	5.2	--	--	--	63	25
	3RT20 24	12	12	9	12	12	9	12	12	9	63	25
	3RT20 25	12	12		12	12	12	12	12	12	63	25
10 ... 40	3RT20 24	12	12	9	12	12	9	12	12	9	63	25
	3RT20 25	17	17	13	16	16	13	14	14	13	63	25
	3RT20 26	25	18	13	16	16	13	14	14	13	100	35
	3RT20 27	32	32	21	18.6	18.6	15.1	16.2	16.2	15.1	125	50
	3RT20 28	38	32	21	22.4	22.4	18.2	19.6	19.6	18.2	125	50
Size S2												
12.5 ... 50 A	3RT20 35	40	40	24	40	40	24	36	36	36	160	80
	3RT20 36	50	50	24	45	45	24	38	38	24	160	80
	3RT20 37	50	50	47	48	48	47	42	42	42	250	125
	3RT20 38	50	50	50	49	49	49	43	43	43	250	160
20 ... 80 A	3RT20 35	40	40	24	40	40	24	36	36	36	160	80
	3RT20 36	50	50	24	45	45	24	38	38	24	160	80
	3RT20 37	65	65	47	48	48	47	42	42	42	250	125
	3RT20 38	80	80	58	49	49	49	43	43	43	250	160
Size S3												
12.5 ... 50 A	3RT10 44	50	50	47	49	49	47	41.7	41.7	41.7	200	125
	3RT10 45	50	50	50	50	50	50	45	45	45	200	160
25 ... 100 A	3RT10 44	65	65	47	49	49	47	41.7	41.7	41.7	200	125
	3RT10 45	80	80	58	53	53	53	45	45	45	200	160
	3RT10 46	95	95	58	59	59	58	50	50	50	200	160
	3RT10 54	100	100	100	81.7	81.7	81.7	69	69	69	355	315
	3RT10 55	--	--	--	100	100	100	90	90	90	355	315
Size S6												
50 ... 200 A	3RT10 54	115	115	115	81.7	81.7	81.7	69	69	69	355	315
	3RT10 55	150	150	150	107	107	107	90	90	90	355	315
	3RT10 56	185	185	170	131	131	131	111	111	111	355	315
Size S10/S12												
55 ... 250 A	3RT10 64	225	225	225	160	160	160	135	135	135	500	400
	3RT10 65	250	250	250	188	188	188	159	159	159	500	400
	3RT10 66	250	250	250	213	213	213	180	180	180	500	400
160 ... 630 A	3RT10 64	225	225	225	160	160	160	--	--	--	500	400
	3RT10 65	265	265	265	188	188	188	--	--	--	500	400
	3RT10 66	300	300	280	213	213	213	180	180	180	500	400
	3RT10 75	400	400	400	284	284	284	240	240	240	630	400
	3RT10 76	500	500	450	355	355	355	300	300	300	630	500
	3RT12 64	225	225	225	225	225	225	173	173	173	500	500
	3RT12 65	265	265	265	265	265	265	204	204	204	500	500
	3RT12 66	300	300	300	300	300	300	231	231	231	500	500
	3RT12 75	400	400	400	400	400	400	316	316	316	800	800
	3RT12 76	500	500	500	500	500	500	385	385	385	800	800
	3TF68 ³⁾	630	630	630	440	440	440	376	376	376	800	500 ⁴⁾
	3TF69 ³⁾	630	630	630	572	572	572	500	500	500	800	630 ⁴⁾

1) Please observe operational voltage.

2) Coordination and short-circuit equipment according to EN 60947-4-1:

Type of coordination 1: the contactor or starter must not endanger persons or the installation in the event of a short-circuit.

They do not need to be suitable for further operation without repair and the renewal of parts.

Type of coordination 2: the contactor or starter must not endanger persons or the installation in the event of a short-circuit.

They must be suitable for further operation. There is a risk of contact welding.

3) Contactor cannot be mounted.

4) Please ensure that the maximum AC-3 operational current has sufficient safety clearance from the rated current of the fuses.

Characteristic curves

The tripping characteristics show the relationship between the tripping time and tripping current as multiples of the set current I_e and are given for symmetrical three-pole and two-pole loads from the cold state.

The smallest current used for tripping is called the minimum tripping current. According to IEC 60947-4-1, this current must be within specified limits. The limits of the total tripping current for the 3RB20/3RB21 solid-state overload relays for symmetrical three-pole loads are between 105 % and 120 % of the set current.

The tripping characteristic starts with the minimum tripping current and continues with higher tripping currents based on the characteristics of the so-called trip classes (CLASS 10, CLASS 20 etc.). The trip classes describe time intervals within which the overload relays have to trip with 7.2 times the set current I_e from the cold state for symmetrical three-pole loads.

The tripping times according to IEC 60947-4-1, tolerance band E, are as follows for:

Trip class	Tripping time
CLASS 5	3 ... 5 s
CLASS 10	5 ... 10 s
CLASS 20	10 ... 20 s
CLASS 30	20 ... 30 s

The tripping characteristic for a three-pole overload relay from the cold state (see illustration 1) only apply if all three phases are simultaneously loaded with the same current. In the event of a phase failure the 3RB20/3RB21 solid-state overload relays switch off the contactor more quickly in order to minimize heating of the load in accordance with the tripping characteristic for two-pole loads from the cold state (see illustration 2). With phase unbalance the devices switch off depending on the reason for the unbalance between the two characteristic curves.

Compared with a cold load, a load at operating temperature obviously has a lower temperature reserve. The tripping time of the 3RB2/3RB3 solid-state overload relays is reduced therefore to about 30 % when loaded with the set current I_e for an extended period.

Tripping characteristics for 3-pole loads

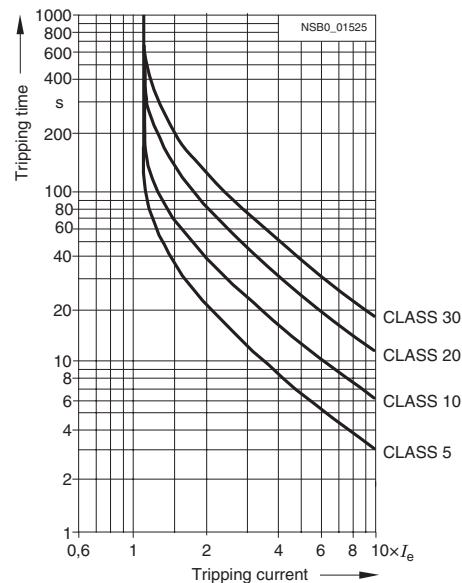


Illustration 1

Tripping characteristics for 2-pole loads

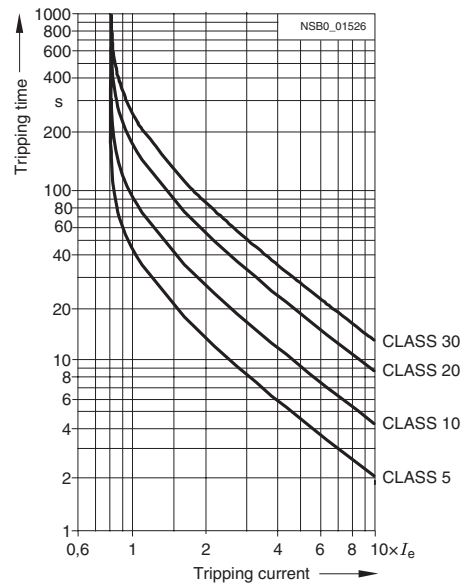


Illustration 2

The above illustrations are schematic representations of characteristic curves.

Overload Relays

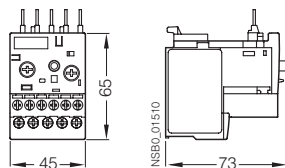
3RB2 / 3RB3 Solid-State Overload Relays

3RB20, 3RB21, 3RB30, 3RB31 up to 630A
for standard applications

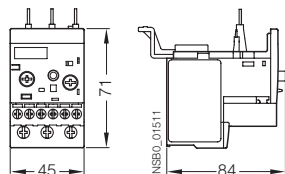
• Revised •
10/18/15



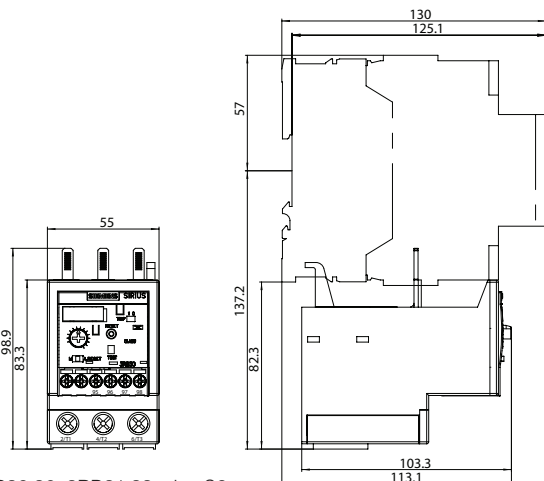
Dimensional drawings



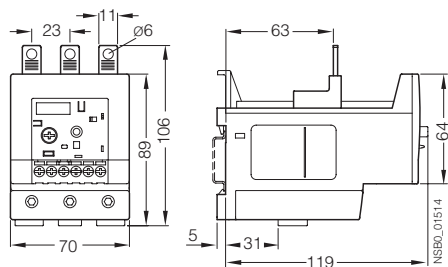
3RB30 16, 3RB31 13, size S00



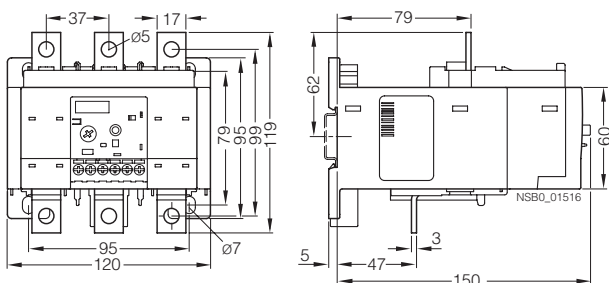
3RB30 26, 3RB31 23, size S0



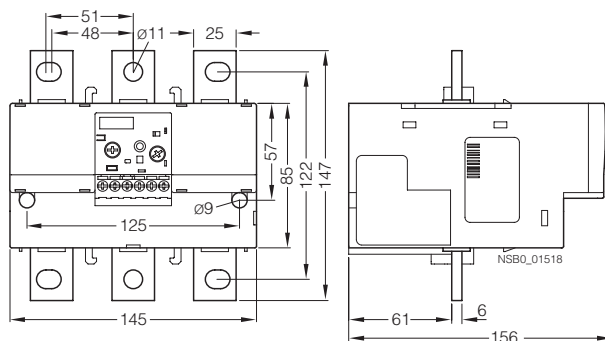
3RB30 36, 3RB31 33, size S2



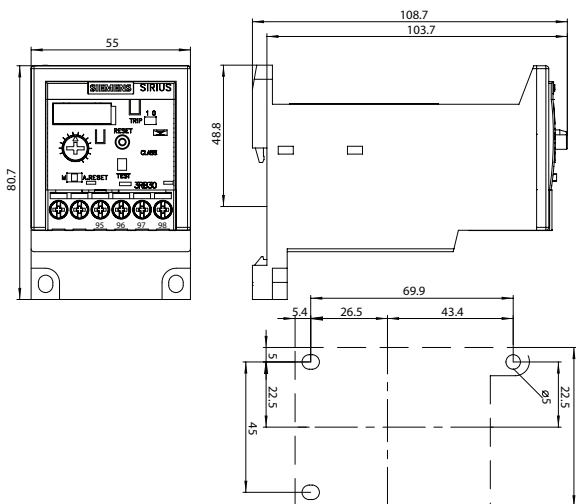
3RB20 46, 3RB21 43, size S3



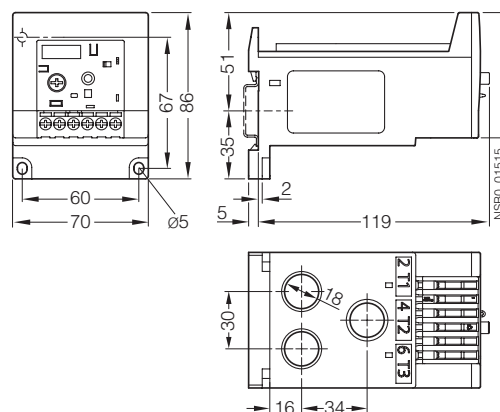
3RB20 56, 3RB21 53, size S6



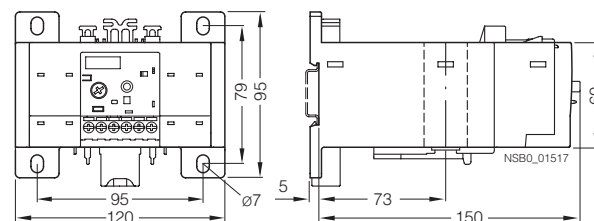
3RB20 66, 3RB21 63, size S10/S12



3RB30 36, 3RB31 33, size S2 with straight-through transformer



3RB20 46, 3RB21 43, size S3 with straight-through transformer



3RB20 56, 3RB21 53, size S6 with straight-through transformer

Overload Relays

3RB2 / 3RB3 Solid-State Overload Relays

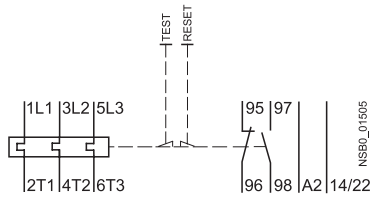
3RB20, 3RB21, 3RB30, 3RB31 up to 630A
for standard applications

1

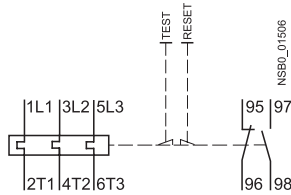
2

3

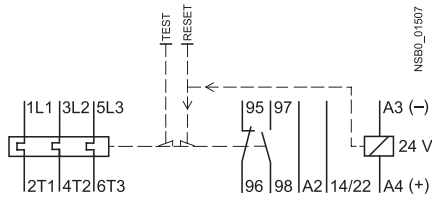
Schematics



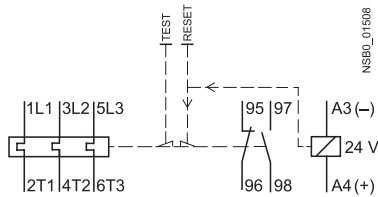
3RB30 16 overload relays



3RB30 26 to 3RB20 66 overload relays



3RB31 13 overload relays



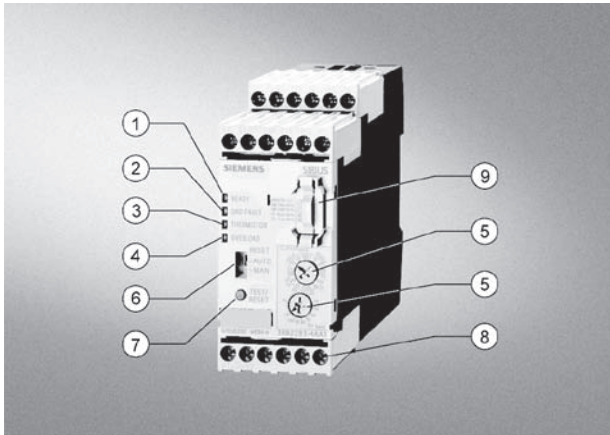
3RB31 23 to 3RB21 63 overload relays

Overload Relays

3RB2 Solid-State Overload Relays

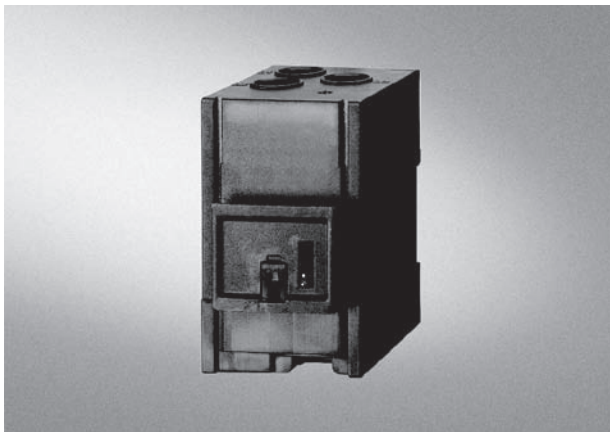
3RB22, 3RB23 for
high-feature applications

Overview



3RB22/3RB23 evaluation module

- (1) Green "Ready" LED:
A continuous green light signals that the device is working correctly.
- (2) Red "Ground Fault" LED:
A continuous red light signals a ground fault.
- (3) Red "Thermistor" LED:
A continuous red light signals an active thermistor trip.
- (4) Red "Overload" LED:
A continuous red light signals an active overload trip; a flickering red light signals an imminent trip (overload warning).
- (5) Motor current and trip class adjustment:
Setting the device to the motor current and to the required trip class dependent on the starting conditions is easy with the two rotary knobs.
- (6) Selector switch for manual/automatic RESET:
With this switch you can choose between manual and automatic RESET.
- (7) Test/RESET button:
Enables testing of all important device components and functions, plus resetting of the device after a trip when manual RESET is selected.
- (8) Connecting terminals (removable terminal block):
The generously sized terminals permit connection of two conductors with different cross-sections for the auxiliary, control and sensor circuits. Connection is possible with screw-type terminals and alternatively with spring-loaded terminals.
- (9) 3RB29 85 function expansion module:
Enables more functions to be added, e.g. internal ground fault detection and/or an analog output with corresponding signals.



3RB29 06 current measuring module

The modular, solid-state overload relays with external power supply type 3RB22 (with monostable auxiliary contacts) and type 3RB23 (with bistable auxiliary contacts) up to 630 A (up to 820 A possible with a series transformer) have been designed for inverse-time delayed protection of loads with normal and heavy starting (see [Function](#)) against excessive temperature rises due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set motor rated current. This current rise is detected by means of a current measuring module and electronically evaluated by a special evaluation module which is connected to it. The evaluation electronics sends a signal to the auxiliary contacts. The auxiliary contacts then switch off the load by means of the contactors control circuit. The break time depends on the ratio between the tripping current and set current I_e and is stored in the form of a long-term stable tripping characteristic (see [Characteristic Curves](#)). The "tripped" status is signaled by means of a continuous red "Overload" LED.

The LED indicates imminent tripping of the relay due to overload, phase unbalance or phase failure by flickering when the limit current has been violated. This warning can also be used as a signal through auxiliary contacts.

In addition to the described inverse-time delayed protection of loads against excessive temperature rise, the 3RB22/3RB23 solid-state overload relays also allow direct temperature monitoring of the motor windings (full motor protection) by failsafe connection of a PTC sensor circuit. With this temperature-dependent protection, the loads can be protected against overheating caused indirectly by reduced coolant flow, for example, which cannot be detected by means of the current alone. In the event of overheating, the devices signal the contactor to switch off, and thus the load, by means of the auxiliary contacts. The "tripped" status is signaled by means of a continuous red "Thermistor" LED.

To also protect the loads against high-resistance short-circuits due to damage to the insulation, humidity, condensed water, etc., the 3RB22/3RB23 solid-state overload relays offer the possibility of internal ground fault monitoring in conjunction with a function expansion module; not possible in conjunction with a contactor assembly for Wye-Delta starting). In the event of a ground fault the 3RB22/3RB23 relays trip instantaneously. The "tripped" status is signaled by means of a red "Ground Fault" LED. Signaling through auxiliary contacts is also possible.

After tripping due to overload, phase unbalance, phase failure, thermistor tripping or ground fault, the relay may be reset manually or automatically after the recovery time has elapsed (see [Function](#)).

In conjunction with a function expansion module the motor current measured by the microprocessor can be output in the form of an analog signal 4 ... 20 mA DC for operating rotary coil instruments or for feeding into analog inputs of programmable logic controllers. With an additional AS-Interface analog module the current values can also be transferred over the AS-i bus system.

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials.

They comply with important worldwide standards and approvals.

Overload Relays

3RB2 Solid-State Overload Relays

**3RB22, 3RB23 for
high-feature applications**

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Benefits

The most important features and benefits of the 3RB22/3RB23 solid-state overload relays are listed in the overview table (see [Overload Relays, General Data](#)).

Application

Industries

The 3RB22/3RB23 solid-state overload relays are suitable for customers from all industries who want to provide optimum inverse-time delayed and temperature-dependent protection of their electrical loads (e.g. motors) under normal and heavy starting conditions (CLASS 5 to CLASS 30), minimize project completion times, inventories and power consumption, and optimize plant availability and maintenance management.

Application

The 3RB22/3RB23 solid-state overload relays have been designed for the protection of three-phase asynchronous and single-phase AC motors.

If single-phase AC motors are to be protected by the 3RB22/3RB23 solid-state overload relays, the main circuits of the current measuring modules must be series-connected.

Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive environments, ageing and temperature changes.

For the temperature range from –25 °C to +60 °C, the 3RB22/3RB23 solid-state overload relays compensate the temperature according to IEC 60947-4-1.

Configuration notes for use of the devices below –25 °C or above +60 °C on request.

"Increased safety" type of protection EEx e according to ATEX guideline 94/9/EC

The 3RB22/3RB23 solid-state overload relays are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e. The relays meet the requirements of EN 60079-7 (Electrical apparatus for potentially explosive atmospheres – Increased safety "e").

When using 3RB23 solid-state overload relays for the protection of EEx e motors, separate monitoring of the control supply voltage is recommended.

The basic safety and health requirements of ATEX guideline 94/9/EC are fulfilled by compliance with

- EN 60947-1
- EN 60947-4-1
- EN 60947-5-1
- EN 60079-14

EU type test certificate for Group II, Category (2) G/D under application. Number on request.

Accessories

The following accessories are available for the 3RB22/3RB23 solid-state overload relays:

- A sealable cover for the evaluation module
- Box terminal blocks for the current measuring modules size S6 and S10/S12
- Terminal covers for the current measuring modules size S6 and S10/S12
- Push-in lugs for screw (panel) mounting the size S00 to S3 current measuring modules

Overload Relays

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3RB22, 3RB23 for
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• Revised •

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3RB22/3RB23 solid-state overload relays for full motor protection with screw connection or spring-loaded terminals for stand-alone installation, CLASS 5, 10, 20 and 30 adjustable

Features and technical specifications:

- Overload protection, phase failure protection and unbalance protection
- External power supply 24 ... 240 V AC/DC
- Auxiliary contacts 2 NO +2 NC
- Manual and automatic RESET
- Electrical remote RESET integrated
- 4 LEDs for operating and status displays
- TEST function and self-monitoring
- Internal ground fault detection with function expansion module
- Screw connection or spring-loaded terminals for auxiliary, control and sensor circuits
- Input for PTC sensor circuit
- Analog output with function expansion module

Size Contactor	Version	Connection type	Order No.	Weight per PU approx. kg	
Evaluation modules					
	S00 ... S12	Monostable	Screw connection	3RB22 83-4AA1	0.300
			Spring-loaded terminals	3RB22 83-4AC1	0.300
	Bistable	Screw connection	3RB23 83-4AA1	0.300	
		Spring-loaded terminals	3RB23 83-4AC1	0.300	
					
3RB2. 83-4AC1					
Function expansion modules					
—	Analog Basic 1 module ¹⁾ Analog output DC 4 ... 20 mA, with overload warning		3RB29 85-2AA0	0.030	
	Analog Basic 1 GF module ¹⁾²⁾ Analog output DC 4 ... 20 mA, with internal ground fault detection and overload warning		3RB29 85-2AA1	0.030	
	Analog Basic 2 GF module ¹⁾²⁾ Analog output DC 4 ... 20 mA, with internal ground fault detection and ground fault signaling		3RB29 85-2AB1	0.030	
	Basic 1 GF module ²⁾ with internal ground fault detection and overload warning		3RB29 85-2CA1	0.030	
	Basic 2 GF module ²⁾ with internal ground fault detection and ground fault signaling		3RB29 85-2CB1	0.030	

1) The analog signal 4 ... 20 mA DC can be used for operating rotary coil instruments or for feeding into analog inputs of programmable logic controllers.

- 2) The following information on ground fault protection refers to sinusoidal residual currents at 50/60 Hz:
- With a motor current of between 0.3 and 2 times the set current I_n the unit will trip at a ground fault current equal to 30% of the set current.
 - With a motor current of between 2 and 8 times the set current I_n the unit will trip at a ground fault current equal to 15% of the set current.
 - The trip delay amounts to between 0.5 and 1 second.

Note: Analog input modules, e. g. SM 331, must be configured for 4-wire measuring transducers. In this case the analog input module must not supply current to the analog output of the 3RB22/ 3RB23 relay.

For accessories, see page 3/35

For description, see pages 3/32-3/33

For technical data, see pages 3/36-3/44.

For dimension drawings, see pages 3/45-3/46.

For schematic diagrams, see page 3/47.

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Current measuring modules for direct mounting¹⁾ and stand-alone installation¹⁾²⁾


Size Con-tactor ³⁾	Set current value of the inverse-time delayed overload trip A	Order No.	Weight per PU approx. kg
Size S00/S0²⁾⁴⁾			
	S00/S0	0.3 ... 3	3RB29 06-2BG1 0.100
		2.4 ... 25	3RB29 06-2DG1 0.150
Size S2/S3²⁾⁴⁾			
	S2/S3	10 ... 100	3RB29 06-2JG1 0.350
Size S6¹⁾⁴⁾			
	S6	20 ... 200	3RB29 56-2TG2 0.600
		with pass through CT's with busbar	3RB29 56-2TH2 1.000
Size S10/S12¹⁾			
	S10/S12 and size 14 (3TF68/ 3TF69)	63 ... 630	3RB29 66-2WH2 1.750

1) The current measuring modules with an Order No. ending with "2" are designed for direct mounting and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.

2) The current measuring modules with an Order No. ending with "1" are designed for stand-alone installation.

3) Observe maximum rated operational current of the devices.

4) The modules with an Order No. with "G" in 11th position are equipped with a straight-through transformer.

Size Contactor	Version	Order No.	Weight per PU approx. kg
Connecting cables (essential accessory)			
	S00 ... S12	For connection between evaluation module and current measuring module	
		• Length 0.1 m • Length 0.5 m	3RB29 87-2B 0.010 3RB29 87-2D 0.020

For description, see pages 3/36-3/37

For technical data, see pages 3/39-3/42.

For dimension drawings, see pages 3/45-3/46.

For schematic diagrams, see page 3/47,

Overload Relays

3RB2 Solid-State Overload Relays

3RB22, 3RB23 for high-feature applications

Design

Device concept

The 3RB22/3RB23 solid-state overload relays are based on a modular device concept. Each device always comprises an evaluation module, which is independent of the motor current, and a current measuring module, which is dependent on the motor current. The two modules are electrically interconnected by a connection cable through the system interface.

The basic functionality of the evaluation module can be optionally expanded with corresponding function expansion modules. The function expansion modules are integrated in the evaluation module for this purpose through a simple plug connection.

Mounting options

Current measuring modules

The current measuring modules size S00/S0 and S2/S3 are designed for stand-alone installation. By contrast, the current measuring modules size S6 and S10/S12 are suitable for stand-alone installation or direct mounting.

Evaluation modules

The evaluation modules can be mounted either on the current measuring module (only sizes S00/S0 and S2/S3) or separately.

Connection technique

Main circuit (current measuring module)

For sizes S00/S0, S2/S3 and S6, the main circuit can also be connected by the straight-through transformer method. In this case, the cables of the main circuit are routed directly through the feed-through openings of the relay to the contactor terminals.

For sizes S6 and S10/S12, the main circuit can be connected with the help of the Busbar. In conjunction with the corresponding box terminals, screw terminals are also available.

Auxiliary circuit (evaluation module)

Connection of the auxiliary circuit (removable terminal block) is possible with either screw terminals or spring-loaded terminals.

Overload relays in contactor assemblies for Wye-Delta starting

When overload relays are used in combination with contactor assemblies for Wye-Delta starting it must be noted that only 0.58 times the motor current flows through the line contactor. An overload relay mounted onto the line contactor must be set to 0.58 times the motor current.

When 3RB22/3RB23 solid-state overload relays are used in combination with contactor assemblies for Wye-Delta starting, the function expansion modules for internal ground-fault detection must not be used.

Operation with frequency converter

The 3RB22/3RB23 solid-state overload relays are suitable for frequencies of 50/60 Hz and the associated harmonics. This permits the 3RB22/3RB23 overload relays to be used on the incoming side of the frequency converter.

If motor protection is required on the outgoing side of the frequency converter, the 3RN thermistor motor protection devices or the 3RU11 thermal overload relays are available for this purpose.

Function

Basic functions

The 3RB22/3RB23 solid-state overload relays are designed for:

- Inverse-time delayed protection of loads from overloading
- Inverse-time delayed protection of loads from phase unbalance
- Inverse-time delayed protection of loads from phase failure
- Temperature-dependent protection of loads by connecting a PTC sensor circuit
- Protection of loads from high-resistance short-circuits (internal ground-fault detection; detection of fault currents > 30 % of the set current I_e)
- Output of an overload warning
- Output of an analog signal 4 to 20 mA DC as image of the flowing motor current

The basic functions of the evaluation modules in conjunction with function expansion modules are listed in the following table:

Evaluation module	Function expansion module	Basic functions
3RB22 83-4AA1 3RB22 83-4AC1 3RB23 83-4AA1 3RB23 83-4AC1	None	Inverse-time delayed protection, temperature-dependent protection, electrical remote RESET, overload warning
	3RB29 85-2CA1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, overload warning
	3RB29 85-2CB1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, ground fault signal
	3RB29 85-2AA0	Inverse-time delayed protection, temperature-dependent protection, electrical remote RESET, overload warning, analog output
	3RB29 85-2AA1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, overload warning, analog output
	3RB29 85-2AB1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, ground fault signal, analog output

Control circuit

The 3RB22/3RB23 solid-state overload relays require an external power supply (24–240 V AC/DC), i.e. an additional supply voltage is necessary.

Short-circuit protection

Fuses or motor starter protectors must be used for short-circuit protection. For assignments of the corresponding short-circuit protection devices to the 3RB22/3RB23 solid-state overload relays with/without contactor see [Technical Specifications and Selection and Ordering Data](#).

Trip classes

The 3RB22/3RB23 solid-state overload relays are suitable for normal and heavy starting. The required trip class (CLASS 5, 10, 20 or 30) can be adjusted by means of a rotary knob depending on the current starting condition.

For details of the trip classes see [Characteristic Curves](#).

Phase failure protection

The 3RB22/3RB23 solid-state overload relays are fitted with phase failure protection (see [Characteristic Curves](#)) in order to minimize temperature rises of the load during single-phase operation.

Setting

The 3RB22/3RB23 solid-state overload relays are set to the motor rated current by means of two rotary knobs.

- The upper rotary knob (CLASS/ I_{emax}) is divided into 4 ranges: 1 A, 10 A, 100 A and 1000 A. The zone must be selected which corresponds to the rated motor current and the current measuring module to be used with it. With the range selected the required trip class (CLASS 5, 10, 20 or 30) can be determined.
- The lower rotary knob with percent scale (10 % ... 100 %) is then used to set the rated motor current in percent of the range selected with the upper rotary button.

Example

- Rating of induction motor = 45 kW (50 Hz, 400 V AC)
- Rated motor current = 80 A
- Required trip class = CLASS 20
- Selected transformer: 10 to 100 A

Solution

- Step 1: Use the upper rotary knob (CLASS) to select the 100 A range
- Step 2: Within the 100 A range set the trip class CLASS 20
- Step 3: Set the lower rotary knob to 80 % (= 0.8) of 100 A \times 0.8 = 80 A.

If the current which is set on the evaluation module does not correspond to the current range of the connected current transformer, an error will result.

Manual and automatic reset

In the case of the 3RB22/3RB23 solid-state overload relays, a slide switch can be used to choose between automatic and manual resetting.

If manual reset is set, a reset can be carried out directly on the device after a trip by pressing the blue TEST/RESET button. A remote RESET can be carried out electrically by jumpering the terminals Y1 and Y2.

If the slide switch is set to automatic RESET, the relay is reset automatically.

The time between tripping and resetting is determined by the recovery time.

Recovery time

With the 3RB22/3RB23 solid-state overload relays the recovery time after inverse-time delayed tripping is approx. 3 minutes regardless of the selected reset mode. The recovery time allows the load to cool down.

However, in the event of temperature-dependent tripping by means of a connected PTC thermistor sensor circuit, the device can only be manually or automatically reset once the winding temperature at the installation location of the PTC thermistor has fallen 5 Kelvin below its response temperature.

After a ground fault trip the 3RB22/3RB23 solid-state overload relay trips can be reset immediately without a recovery time.

TEST function

The combined TEST/RESET button can be used to check whether the relay is working correctly. The test can be aborted at any time by letting go of the TEST/RESET button.

LEDs, the device configuration (this depends on which expansion module is plugged in) and the device hardware are tested while the button is kept pressed for 6 seconds. Simultaneously and for another 18 seconds a direct current proportional in size to the maximum phase of the main current is fed in at the terminals I(+) and I(-). By comparing the analog signal, which is to be measured, with the main current, the accuracy of the current measurement can be determined. In this case 4 mA corresponds to 0 % and 20 mA to 125 % of the set current. After 24 seconds the auxiliary contacts are switched and the feeder switch off as the result, bringing the test to an end.

After a test trip a faultless relay is reset by pressing the TEST/RESET button. If a hardware fault is detected, the device trips and cannot be reset.

Self-monitoring

The 3RB22/3RB23 solid-state overload relays have a self-monitoring feature, i.e. the devices constantly monitor their own basic functions and trip if an internal fault is detected.

Display of the operating status

The particular operating status of the 3RB22/3RB23 solid-state overload relays is displayed by means of four LEDs:

- Green "Ready" LED: A continuous green light signals that the overload relay is ready for operation. The 3RB22/3RB23 overload relays are not ready (LED "OFF") if there is no control supply voltage or if the function test was negative.
- Red "Ground fault" LED: A continuous red light signals a ground fault.
- Red "Thermistor" LED: A continuous red light signals a temperature-dependent trip.
- Red "Overload" LED: A continuous red light signals an inverse-time delayed trip; a flickering red light signals an imminent inverse-time delayed trip (overload warning).

Auxiliary contacts

The 3RB22/3RB23 solid-state overload relays have two outputs, each with one NO contact and one NC contact. Their basic assignment/function may be influenced by function expansion modules.

The 3RB22 and 3RB23 differ with respect to the tripping characteristics of their auxiliary contacts – monostable or bistable:

The monostable 3RB22 solid-state overload relays will enter the "tripped" state if the control supply voltage fails (> 200 ms), and return to the original state they were in before the control supply voltage failed when the voltage returns. These devices are therefore especially suited for plants in which the control voltage is not strictly monitored.

The bistable 3RB23 overload relays do not change their "tripped" or "not tripped" status if the control voltage fails. The auxiliary contacts only switch over in the event of an overload and if the supply voltage is present. These devices are therefore especially suited for plants in which the control voltage is monitored separately.

Response if the control supply voltage fails

If the control supply voltage fails for more than 0.2 s, the output relays respond differently depending on the version: Monostable or bistable.

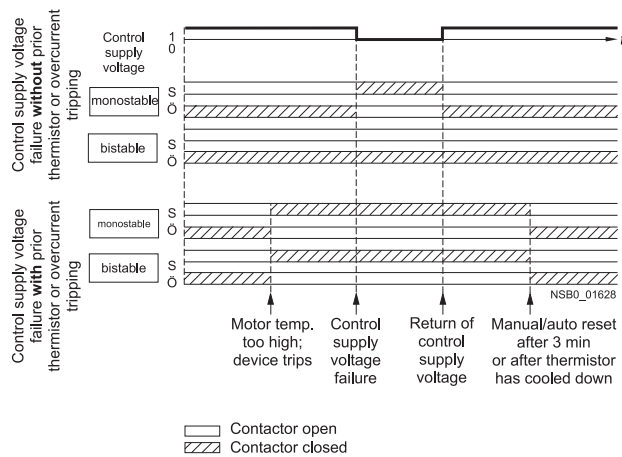
Overload Relays

3RB2 Solid-State Overload Relays

3RB22, 3RB23 for high-feature applications

Response of the output relays in the event of	Monostable 3RB22	Bistable 3RB23
Failure of the control supply voltage	The device trips	No change of the switching status of the auxiliary contacts
Return of the control supply voltage without previous tripping	The device resets	No change of the switching status of the auxiliary contacts
Return of the control supply voltage after previous tripping	The device remains tripped Reset: <ul style="list-style-type: none"> • For overload tripping, after 3 minutes • For thermistor tripping, after the temperature has fallen 5 K below the response temperature • For ground-fault tripping, immediately 	The device remains tripped Reset: <ul style="list-style-type: none"> • For overload tripping, after 3 minutes • For thermistor tripping, after the temperature has fallen 5 K below the response temperature • For ground-fault tripping, immediately

Monostable and bistable responses of the output relays



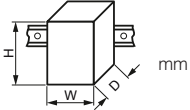

Technical specifications

The following technical information is intended to provide an initial overview of the various types of device and functions.

Detailed information, see

- Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays",
<http://support.automation.siemens.com/WW/view/en/35681297>

- or specific information on a particular article number via the product data sheet,
<http://support.automation.siemens.com/WW/view/en/20357046/133200>

Type – Overload relay: evaluation modules		3RB2283-4A.1	3RB2383-4A.1
Size contactor		S00 ... S10/S12	
Dimensions of evaluation modules (W x H x D)		45 x 111 x 95	
General data			
Trips in the event of		Overload, phase failure and phase unbalance (> 40 % according to NEMA), + ground fault (with corresponding function expansion module) and activation of the thermistor motor protection (with closed PTC sensor circuit)	
Trip class acc. to IEC 60947-4-1	CLASS	5, 10, 20 and 30 adjustable	
Phase failure sensitivity		Yes	
Overload warning		Yes, from $1.125 \times I_e$ for symmetrical loads and from $0.85 \times I_e$ for unsymmetrical loads	
Reset and recovery		Manual, automatic and remote RESET	
• Reset options after tripping			
• Recovery time			
- For automatic RESET		min.	- for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature
- For manual RESET		min.	- for tripping due to a ground fault: no automatic RESET - for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature
- For remote RESET		min.	- for tripping due to a ground fault: Immediately - for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: Immediately
Features			
• Display of operating state on device		Yes, with four LEDs: - green LED "Ready" - red LED "Ground Fault" - red LED "Thermistor" - red LED "Overload"	
• TEST function		Yes, test of LEDs, electronics, auxiliary contacts and wiring of control circuit by pressing the button TEST/RESET / self-monitoring	
• RESET button		Yes, with the TEST/RESET button	
• STOP button		No	
Protection and operation of explosion-proof motors			
EC type test certificate number according to directive 94/9/EC (ATEX)		PTB 05 ATEX 3022  II (2) GD, see http://support.automation.siemens.com/WW/view/en/23115758	--
Ambient temperatures			
• Storage/transport		°C	-40 ... +80
• Operation		°C	-25 ... +60
• Temperature compensation		°C	+60
• Permissible rated current			
- Temperature inside control cabinet 60 °C		%	100
- Temperature inside control cabinet 70 °C		%	On request
Degree of protection acc. to IEC 60529		IP20: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with cover.	
Touch protection acc. to IEC 61140		Finger-safe: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with cover.	
Shock resistance with sine acc. to IEC 60068-2-27		g/ms	15/11
Electromagnetic compatibility (EMC) – Interference immunity			
• Conductor-related interference			
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)		kV	2 (power ports), 1 (signal port)
- Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3)		kV	2 (line to earth), 1 (line to line)
• Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)		kV	8 (air discharge), 6 (contact discharge)
• Field-related interference according to IEC 61000-4-3 (corresponds to degree of severity 3)		V/m	10
Electromagnetic compatibility (EMC) – emitted interference		Degree of severity A according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)	

Overload Relays

3RB2 Solid-State Overload Relays

3RB22, 3RB23 for
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Type – Overload relay of current measuring module		3RB29	3RB29	3RB29	3RB29
Size		S00/S0	S2/S3	S6	S10/S12
Width		45 mm	55 mm	120 mm	145 mm
Main circuit					
Rated insulation voltage U_i (pollution degree 3)	V	1000		1000	
Rated impulse withstand voltage U_{imp}	kV	6		8	
Rated operational voltage U_e	V	690		1000	
Type of current		No			
• Direct current		Yes, 50/60 Hz ± 5 % (other frequencies on request)			
• Alternating current					
Set current	A	0.3 ... 3; 2.4 ... 25	10 ... 100	20 ... 200	63 ... 630
Power loss per unit (max.)	W	0.5			
Short-circuit protection		See Selection and Ordering Data			
• With fuse without contactor		See Technical Specifications (short-circuit protection with fuses for motor feeders)			
• With fuse and contactor					
Safe isolation between main and auxiliary conducting path according to IEC 60947-1	V	690 ¹⁾			
Connection for main circuit					
Electrical connection version		Screw terminals with box terminal			
Screw terminal					
• Terminal screw		--		4 mm Allen screw	5 mm Allen screw
• Tightening torque		--		10 ... 12	20 ... 22
• Conductor cross-sections (min./max.), 1 or 2 conductors					
- Solid	mm ²	--		--	--
- Finely stranded without end sleeve	mm ²	--		With 3RT19 55-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70)	2 × (50 ... 185), front clamping point only: 1 × (70 ... 240)
				With 3RT19 56-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	rear clamping point only: 1 × (120 ... 185)
- Finely stranded with end sleeve	mm ²	--		With 3RT19 55-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70)	2 × (50 ... 185), front clamping point only: 1 × (70 ... 240)
				With 3RT19 56-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	rear clamping point only: 1 × (120 ... 185)
- Stranded	mm ²	--		With 3RT19 55-4G box terminal: 2 × (max. 70), 1 × (16 ... 70)	2 × (70 ... 240), front clamping point only: 1 × (95 ... 300)
				With 3RT19 56-4G box terminal: 2 × (max. 120), 1 × (16 ... 120)	rear clamping point only: 1 × (120 ... 240)
- AWG conductors, solid or stranded	AWG	--		With 3RT19 55-4G box terminal: 2 × (max. 1/0), 1 × (6 ... 2/0)	2 × (2/0 ... 500 kcmil), front clamping point only: 1 × (3/0 ... 600 kcmil)
				With 3RT19 56-4G box terminal: 2 × (max. 3/0), 1 × (6 ... 250 kcmil)	rear clamping point only: 1 × (250 kcmil ... 500 kcmil)
- Ribbon cable conductors (number x width x circumference)	mm	--		With 3RT19 55-4G box terminal: 2 × (6 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 6 × 15.5 × 0.8)	2 × (20 × 24 × 0.5), 1 × (6 × 9 × 0.8 ... 20 × 24 × 0.5)
				With 3RT19 56-4G box terminal: 2 × (10 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 10 × 15.5 × 0.8)	
Busbar connections					
• Terminal screw		--		M8 × 25	M10 × 30
• Tightening torque	Nm	--		10 ... 14	14 ... 24
• Conductor cross-section (min./max.)					
- Solid with cable lug	mm ²	--		16 ... 95 ²⁾	50 ... 240 ³⁾
- Stranded with cable lug	mm ²	--		25 ... 120 ²⁾	70 ... 240 ³⁾
- AWG connections, solid or stranded, with cable lug	AWG	--		4 ... 250 kcmil	2/0 ... 500 kcmil
- With connecting bar (max. width)	mm	--		15	25
Straight-through transformers					
• Diameter of opening	mm	7.5	14	25	--
• Conductor cross-section (max.)					
- NYY	mm ²	4)	4)	120	--
- H07RN-F	mm ²	4)	4)	70	--

1) For grounded networks, otherwise 600 V.

2) When connecting cable lugs according to DIN 46235, use the 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm² to ensure phase spacing.

3) When connecting cable lugs according to DIN 46234 for conductor cross-sections from 240 mm² as well as DIN 46235 for conductor cross-sections from 185 mm², use the 3RT19 56-4EA1 terminal cover to ensure phase spacing.

4) On request.

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Overload Relays

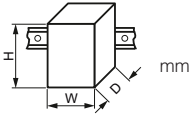
3RB2 Solid-State Overload Relays

3RB22, 3RB23 for
standard applications

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3

Type – Overload relay: evaluation modules		3RB2283-4A.1	3RB2383-4A.1
Size contactor		S00 ... S10/S12	
Dimensions of evaluation modules (W x H x D)		45 x 111 x 95	
General data (continued)			
Resistance to extreme climates – air humidity	%	100	
Dimensions		"Dimensional drawings", see • Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays", http://support.automation.siemens.com/WW/view/en/35681297 • Product data sheet, http://support.automation.siemens.com/WW/view/en/20357046/133200	
Installation altitude above sea level	m	Up to 2 000	
Mounting position		Any	
Type of mounting		Stand-alone installation	
• Evaluation modules		S00 to S3: Stand-alone installation, S6 and S10/S12: stand-alone installation or mounting onto contactors	
• Current measuring module	Size		
Type – Overload relay: evaluation modules		3RB2283-4A.1, 3RB2383-4A.1	
Size contactor		S00 ... S10/S12	
Auxiliary circuit			
Number of NO contacts		2	
Number of NC contacts		2	
Number of CO contacts		--	
Auxiliary contacts – assignment		• Alternative 1 - 1 NO for the signal "tripped by overload and/or thermistor" - 1 NC for disconnecting the contactor - 1 NO for the signal "tripped by ground fault" - 1 NC for disconnecting the contactor or ¹⁾ • Alternative 2 - 1 NO for the signal "tripped by overload and/or thermistor and/or ground fault" - 1 NC for disconnecting the contactor - 1 NO for overload warning - 1 NC for disconnecting the contactor	
Rated insulation voltage U_i (pollution degree 3)	V	300	
Rated impulse withstand voltage U_{imp}	kV	4	
Auxiliary contacts – contact rating			
• NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e			
- 24 V	A	6	
- 120 V	A	6	
- 125 V	A	6	
- 250 V	A	3	
• NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e			
- 24 V	A	6	
- 120 V	A	6	
- 125 V	A	6	
- 250 V	A	3	
• NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e			
- 24 V	A	2	
- 60 V	A	0.55	
- 110 V	A	0.3	
- 125 V	A	0.3	
- 250 V	A	0.2	
• Conventional thermal current I_{th}	A	5	
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes	
Short-circuit protection			
• With fuse, operational class gG	A	6	
• With miniature circuit breaker, C characteristic	A	1.6	
Protective separation between auxiliary current paths acc. to IEC 60947-1	V	300	
CSA, UL, UR rated data			
Auxiliary circuit – switching capacity		B300, R300	



¹⁾ The assignment of auxiliary contacts may be influenced by function expansion modules.

Overload Relays

3RB2 Solid-State Overload Relays

3RB22, 3RB23 for
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Type – Overload relay: evaluation modules		3RB2283-4A.1, 3RB2383-4A.1	
Size contactor		S00 ... S10/S12	
Control circuit			
Rated insulation voltage U_i (pollution degree 3)	V	300	
Rated impulse withstand voltage U_{imp}	kV	4	
Rated control supply voltage U_s			
• 50/60 Hz AC	V	24 ... 240	
• DC	V	24 ... 240	
Operating range			
• 50/60 Hz AC		$0.85 \times U_{s \min} \leq U_s \leq 1.1 \times U_{s \max}$	
• DC		$0.85 \times U_{s \min} \leq U_s \leq 1.1 \times U_{s \max}$	
Rated power			
• 50/60 Hz AC	W	0.5	
• DC	W	0.5	
Mains buffering time	ms	200	
Sensor circuit			
Thermistor motor protection (PTC thermistor sensor)			
• Summation cold resistance	kΩ	≤ 1.5	
• Response value	kΩ	3.4 ... 3.8	
• Return value	kΩ	1.5 ... 1.65	
Ground-fault detection		The information refers to sinusoidal residual currents at 50/60 Hz.	
• Tripping value $I_A^{1)}$ - For $0.3 \times I_e < I_{motor} < 2.0 \times I_e$ - For $2.0 \times I_e < I_{motor} < 8.0 \times I_e$		$> 0.3 \times I_e$ $> 0.15 \times I_{motor}$	
• Response time t_{trip}	ms	500 ... 1 000	
Analog output ¹⁾²⁾			
Rated values			
• Output signal	mA	4 ... 20	
• Measuring range		0 ... $1.25 \times I_e$ 4 mA corresponds to $0 \times I_e$ 16.8 mA corresponds to $1.0 \times I_e$ 20 mA corresponds to $1.25 \times I_e$	
• Load, max.	Ω	100	
Conductor cross-sections for the auxiliary, control and sensor circuit as well as the analog output			
Connection type		 Screw terminals	
Terminal screw		M3, Pozidriv size 2	
Operating devices		mm	3.0 x 0.5
Prescribed tightening torque		Nm	0.8 ... 1.2
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid or stranded	mm ²	$1 \times (0.5 \dots 4)^3, 2 \times (0.5 \dots 2.5)^3$	
• Finely stranded without end sleeve	mm ²	--	
• Finely stranded with end sleeve (DIN 46228-1)	mm ²	$1 \times (0.5 \dots 2.5)^3, 2 \times (0.5 \dots 1.5)^3$	
• AWG cables, solid or stranded	AWG	$2 \times (20 \dots 14)$	
Connection type		 Spring-type terminals	
Operating devices		mm	3.0 x 0.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid or stranded	mm ²	$2 \times (0.25 \dots 1.5)$	
• Finely stranded without end sleeve	mm ²	--	
• Finely stranded with end sleeve (DIN 46228-1)	mm ²	$2 \times (0.25 \dots 1.5)$	
• AWG cables, solid or stranded	AWG	$2 \times (24 \dots 16)$	

1) For the 3RB22 and 3RB23 overload relays in combination with a corresponding function expansion module.

2) Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. In this case the analog input module must not supply current to the analog output of the 3RB22 and 3RB23 relay.

3) If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

Overload Relays

3RB2 Solid-State Overload Relays

3RB22, 3RB23 for
standard applications

• Revised •
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3

Short-circuit protection with fuses for motor feeders

For short-circuit currents up to 50 kA at 400 to 690 V

Overload relays	Contactor	CLASS									690 V	
		5 and 10			20			30			Fuse links ¹⁾	
		Rated operational current I_e AC-3 in A at									LV HRC	
											Type 3NA	
											DIAZED	
											Type 5SB	
											NEOZED	
											Type 5SE	
											gL/gG operational class	
											Type of coordination ²⁾	
Setting range	Type	400 V	500 V	690 V	400 V	500 V	690 V	400 V	500 V	690 V	1	2
Size S00/S0												
0.3 ... 3 A	3RT20 15	3	3	3	3	3	3	3	3	3	35	20
	3RT20 16	3	3	3	3	3	3	3	3	3	35	20
2.4 ... 25 A	3RT20 15	7	5	4	7	5	4	7	5	4	35	20
	3RT20 16	9	6.5	5.2	9	6.5	5.2	9	6.5	5.2	35	20
	3RT20 17	12	9	6.3	10	9	6.3	9	9	6.3	35	20
	3RT20 23	9	6.5	5.2	9	6.5	5.2	--	--	--	63	25
	3RT20 24	12	12	9	12	12	9	12	12	9	63	25
	3RT20 25	17	17	13	16	16	13	14	14	13	63	25
	3RT20 26	25	18	13	16	16	13	14	14	13	100	35
Size S2/S3												
On request	3RT20 35	On request										
	3RT20 36	On request										
	3RT10 44	On request										
	3RT10 45	On request										
	3RT10 46	On request										
	3RT10 54	On request										
3RT10 55	On request											
Size S6												
20 ... 200 A	3RT10 54	115	115	115	81.7	81.7	81.7	69	69	69	355	315
	3RT10 55	150	150	150	107	107	107	90	90	90	355	315
	3RT10 56	185	185	170	131	131	131	111	111	111	355	315
Size S10/S12												
160 ... 630 A	3RT10 64	225	225	225	160	160	160	135	135	135	500	400
	3RT10 65	265	265	265	188	188	188	159	159	159	500	400
	3RT10 66	300	300	280	213	213	213	180	180	180	500	400
	3RT10 75	400	400	400	284	284	284	240	240	240	630	400
	3RT10 76	500	500	450	355	355	355	300	300	300	630	500
	3RT12 64	225	225	225	225	225	225	173	173	173	500	500
	3RT12 65	265	265	265	265	265	265	204	204	204	500	500
	3RT12 66	300	300	300	300	300	300	231	231	231	500	500
	3RT12 75	400	400	400	400	400	400	316	316	316	800	800
	3RT12 76	500	500	500	500	500	500	385	385	385	800	800
	3TF68 ³⁾	630	630	630	440	440	440	376	376	376	800	500 ⁴⁾
	3TF69 ³⁾	630	630	630	572	572	572	500	500	500	800	630 ⁴⁾

1) Please observe operational voltage.

2) Coordination and short-circuit equipment according to EN 60947-4-1:

Type of coordination 1: the contactor or starter must not endanger persons or the installation in the event of a short-circuit. They do not need to be suitable for further operation without repair and the renewal of parts.

Type of coordination 2: the contactor or starter must not endanger persons or the installation in the event of a short-circuit. They must be suitable for further operation. There is a risk of contact welding.

3) Contactor cannot be mounted.

4) Please ensure that the maximum AC-3 operational current has sufficient safety clearance from the rated current of the fuses.

Overload Relays

3RB2 Solid-State Overload Relays

3RB22, 3RB23 for
standard applications

Characteristic curves

The tripping characteristics show the relationship between the tripping time and tripping current as multiples of the set current I_e and are given for symmetrical three-pole and two-pole loads from the cold state.

The smallest current used for tripping is called the minimum tripping current. According to IEC 60947-4-1, this current must be within specified limits. The limits of the minimum tripping current for the 3RB22/3RB23 solid-state overload relays for symmetrical three-pole loads are between 105 % and 120 % of the set current.

The tripping characteristic starts with the minimum tripping current and continues with higher tripping currents based on the characteristics of the so-called trip classes (CLASS 10, CLASS 20 etc.). The trip classes describe time intervals within which the overload relays have to trip with 7.2 times the set current I_e from the cold state for symmetrical three-pole loads.

The tripping times according to IEC 60947-4-1, tolerance band E, are as follows for:

Trip class	Tripping time
CLASS 5	3 ... 5 s
CLASS 10	5 ... 10 s
CLASS 20	10 ... 20 s
CLASS 30	20 ... 30 s

The tripping characteristic for a three-pole overload relay from the cold state (see illustration 1) only apply if all three phases are simultaneously loaded with the same current. In the event of a phase failure or a current unbalance of more than 40 %, the 3RB22/3RB23 solid-state overload relays switch off the contactor more quickly in order to minimize heating of the load in accordance with the tripping characteristic for two-pole loads from the cold state (see illustration 2).

Compared with a cold load, a load at operating temperature obviously has a lower temperature reserve. The tripping time of the 3RB22/3RB23 solid-state overload relays are reduced therefore to about 30 % when loaded with the set current I_e for an extended period.

Tripping characteristics for 3-pole loads

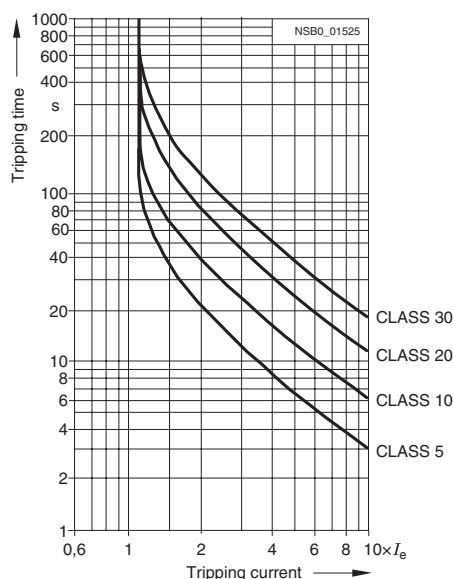


Illustration 1

Tripping characteristics for 2-pole loads

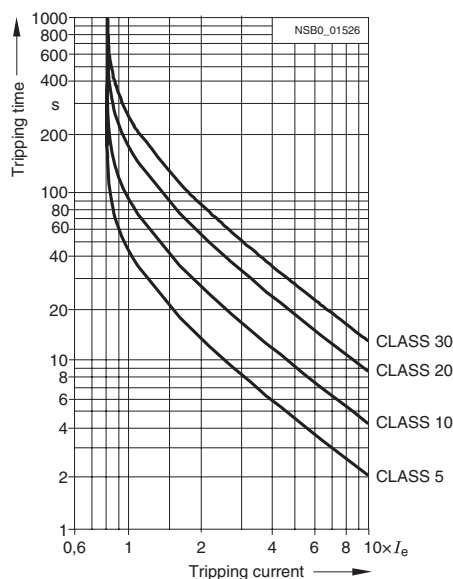
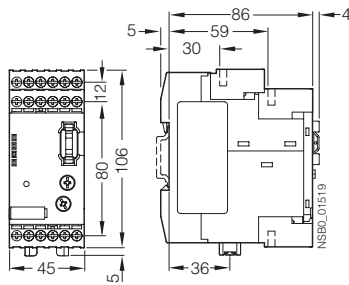


Illustration 2

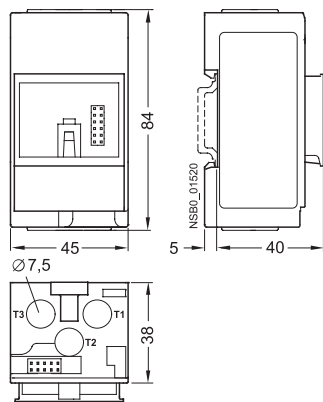
The above illustrations are schematic representations of characteristic curves. The characteristic curves of the individual 3RB22/3RB23 solid-state overload relays can be requested from Technical Assistance at the following e-mail address:

Technical-assistance@siemens.com

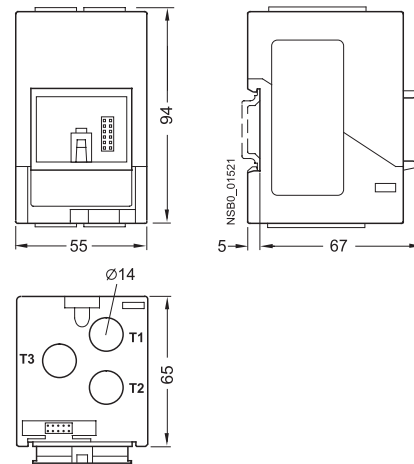
Dimensional drawings



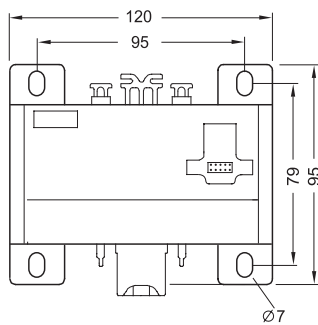
3RB22 83-4, 3RB23 83-4 evaluation module



3RB29 06-2BG1, 3RB29 06-2DG1 current measuring module



3RB29 06-2JG1 current measuring module

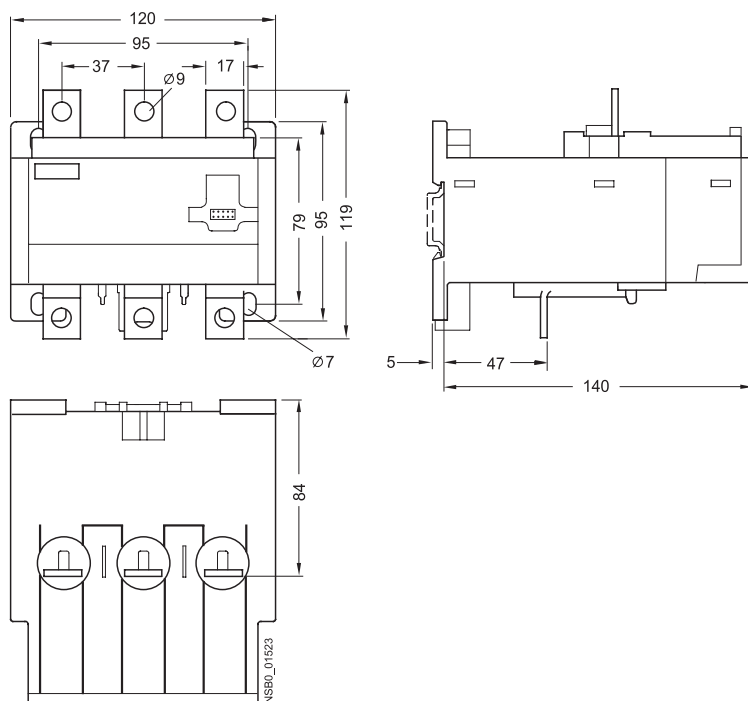


3RB29 56-2TG2 current measuring module

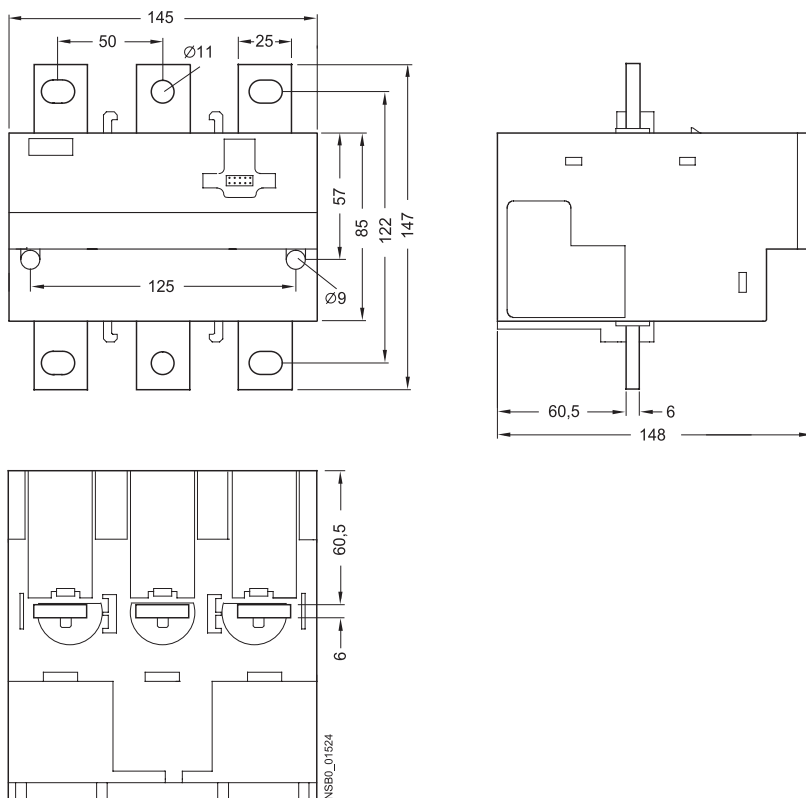
Overload Relays

3RB2 Solid-State Overload Relays

3RB22, 3RB23 for
standard applications



3RB29 56-2TH2 current measuring module



3RB29 66-2WH2 current measuring module

• Revised •
09/30/14

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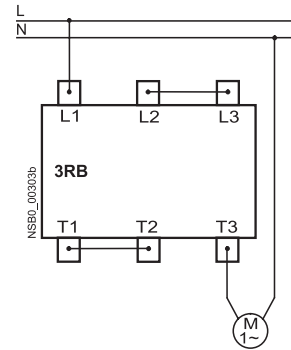
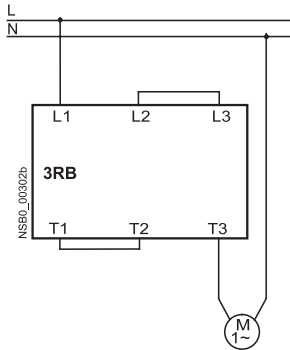
2

3

Schematics

Protection of single-phase motors

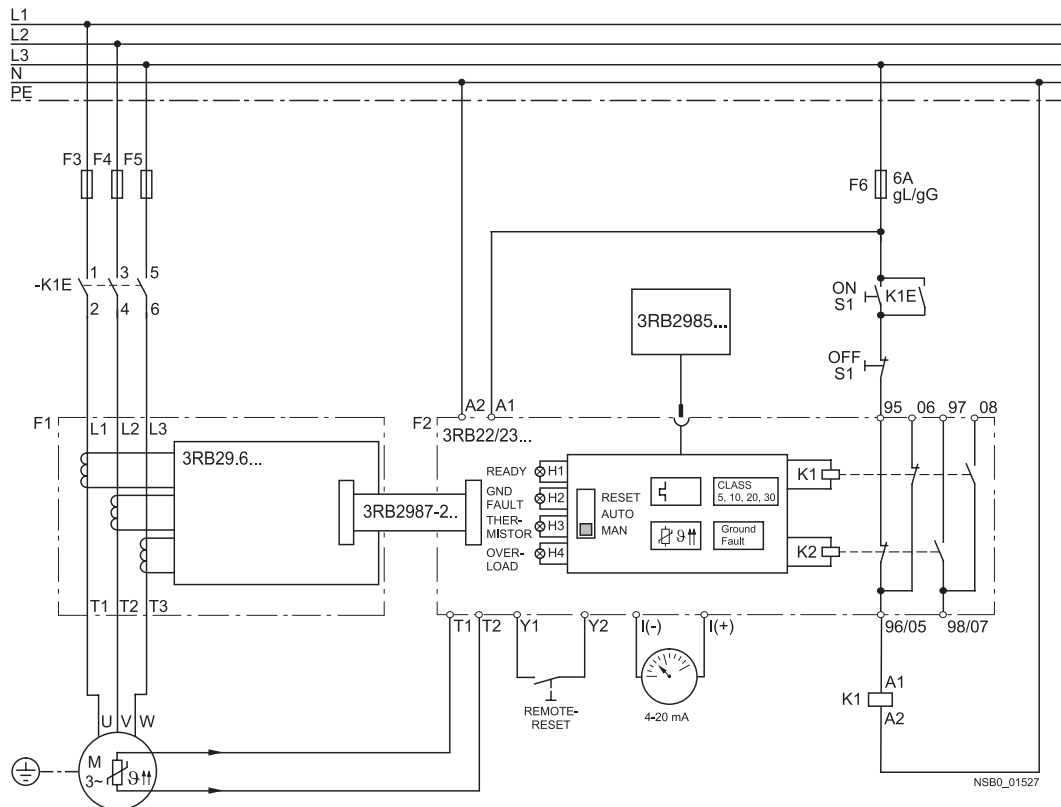
(not in conjunction with internal ground-fault detection)



3RB29 06-2.G1, 3RB29 56-2TG2

3RB29 56-2TH2, 3RB29 66-2WH2

Schematic representation of a possible application (3-phase)



Overload Relays

3RB2 Solid-State Overload Relays

3RB22, 3RB23 for standard applications

Connections

Evaluation module	Function expansion module	Basic functions	Inputs A1/A2	T1/T2	Y1/Y2
3RB22 83-4AA1 3RB22 83-4AC1 3RB23 83-4AA1 3RB23 83-4AC1	None	Inverse-time delayed protection, temperature-dependent protection, electrical remote RESET, overload warning	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET
	3RB29 85-2CA1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, overload warning	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET
	3RB29 85-2CB1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, ground fault signal	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET
	3RB29 85-2AA0	Inverse-time delayed protection, temperature-dependent protection, electrical remote RESET, overload warning, analog output	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET
	3RB29 85-2AA1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, overload warning, analog output	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET
	3RB29 85-2AB1	Inverse-time delayed protection, temperature-dependent protection, internal ground-fault detection, electrical remote RESET, ground fault signal, analog output	Power supply 24 ... 240 V AC/DC	Connection for PTC sensor	Electrical remote RESET

Evaluation module	Function expansion module	Outputs I (-) / I (+)	95/96 NC	97/98 NO	05/06 NC	07/08 NO
3RB22 83-4AA1 3RB22 83-4AC1 3RB23 83-4AA1 3RB23 83-4AC1	None	No	Switching off the contactor (inverse-time delayed/temperature-dependent protection)	Signal "tripped"	Overload warning	Overload warning
	3RB29 85-2CA1	No	Switching off the contactor (inverse-time delayed/temperature-dependent protection + ground fault)	Signal "tripped"	Overload warning	Overload warning
	3RB29 85-2CB1	No	Switching off the contactor (inverse-time delayed/temperature-dependent protection)	Signal "tripped"	Switching off the contactor (ground fault)	Signal "ground fault trip"
	3RB29 85-2AA0	Analog signal	Switching off the contactor (inverse-time delayed/temperature-dependent protection)	Signal "tripped"	Overload warning	Overload warning
	3RB29 85-2AA1	Analog signal	Switching off the contactor (inverse-time delayed/temperature-dependent protection + ground fault)	Signal "tripped"	Overload warning	Overload warning
	3RB29 85-2AB1	Analog signal	Switching off the contactor (inverse-time delayed/temperature-dependent protection)	Signal "tripped"	Switching off the contactor (ground fault)	Signal "ground fault trip"

Overview

Overload relays for standard applications

The following accessories are available for the 3RB2/3RB3 solid-state overload relays:




- One terminal bracket each for the overload relays size S00 and S0 (sizes S2 to S12 can be installed as single units without a terminal bracket)
- One mechanical RESET module for all sizes
- One cable release for resetting devices which are difficult to access (for all sizes)
- One sealable cover for all sizes
- Box terminal blocks for sizes S6 and S10/S12
- Terminal covers for sizes S2 to S10/S12

Overload relays for high-feature applications

The following accessories are available for the 3RB22/3RB23 solid-state overload relays:

- A sealable cover for the evaluation module
- Box terminal blocks for the current measuring modules size S6 and S10/S12
- Terminal covers for the current measuring modules size S6 and S10/S12
- Push-in lugs for screw mounting the size S00 to S3 current measuring modules

Selection and ordering data

Version		Size	Order No.	Weight per PU approx. kg	
Terminal brackets for stand-alone installation ^{1) 2)}					
	For separate mounting of the overload relay panel mount or snapped onto 35 mm standard mounting rail, size S3 also for 75 mm standard mounting rail	<i>Screw terminals</i>	S00	3RU29 16-3AA01	0.04
			S0	3RU29 26-3AA01	0.05
			S2	3RU29 36-3AA01	0.18
			S3	3RU19 46-3AA01	0.28
3RU29.6-3AA01		<i>Spring Loaded terminals</i>	S00	3RU29 16-3AC01	0.04
			S0	3RU29 26-3AC01	0.06
Mechanical RESET ^{1) 2)}					
	Resetting plungers, holders and formers	S00 to S2	3RB39 80-0A	0.030	
		S3 to S12	3RU19 00-1A	0.038	
	Pushbuttons with extended stroke (12 mm), IP65, Ø 22 mm	S3 to S12	3SB30 00-0EA11	0.021	
	Extension plungers For compensation of the distance between a pushbutton and the unlatching button of the relay	S3 to S12	3SX1 335	0.004	
	Complete mechanical reset assembly	S3 to S12	3SBES-RESET		
3RU19 00-1A with pushbutton and extension plunger					
Cable releases with holder for RESET ^{1) 2)}					
	For holes with Ø 6.5 mm in the mounting plate; max. control panel thickness 8 mm				
		• Length 400 mm	S00 to S2	3RB39 80-0B	0.060
		• Length 600 mm	S00 to S2	3RB39 80-0C	0.073
		• Length 400 mm	S3 to S12	3RU19 00-1B	0.063
		• Length 600 mm	S3 to S12	3RU19 00-1C	0.073
3RU19 00-1.					

1) Accessories with a prefix of 3RB39 are intended for 3RB20/3RB30 overload relays only.







2) Only for 3RB20/3RB21. The accessories are identical to those of the 3RU1/3RU2 thermal overload relays.

Overload Relays

3RB2 Solid-State Overload Relays

Accessories

• Revised •
04/20/15

Version	Size	Order No.	List Price \$	Pack Units	Weight per PU approx. kg
Sealable covers					
 3RB3984-0	For covering the setting knobs				
	• For 3RB30/3RB31	S00 to S2	3RB39 84-0	10 units	0.003
	• For 3RB20/3RB21	S3 to S12	3RB29 84-0	10 units	0.020
	• For 3RB22 to 3RB24	–	3RB29 84-2	10 units	0.050
Terminal covers					
 3RT19 46-4EA1	Covers for cable lugs and rail connection				
	• Length 100 mm	S6	3RT19 56-4EA1		0.067
	• Length 120 mm	S10/S12	3RT19 66-4EA1		0.124
 3RT19 36-4EA2 The figures show mounting on the contactor	Covers for box terminals				
	• Length 20.6 mm ¹⁾	S2	3RT29 36-4EA2		0.016
	• Length 20.8 mm ¹⁾	S3	3RT19 46-4EA2		0.023
	• Length 25 mm	S6	3RT19 56-4EA2		0.028
	• Length 30 mm	S10/S12	3RT19 66-4EA2		0.038
	Covers for screw connections	S6	3RT19 56-4EA3		0.021
	between contactor and overload relay, without box terminals (1 unit required per combination)	S10/S12	3RT19 66-4EA3		0.062
Box terminal blocks					
 3RT19 5-4G	For round and ribbon cables up to 70 mm ² 2/0 AWG	S6 ²⁾	3RT19 55-4G		0.237
	up to 120mm ² 4/0 AWG	S6	3RT19 56-4G		0.270
	up to 240mm ² 500 mcm	S10/S12	3RT19 66-4G		0.676
	For conductor cross-sections, see LV 1 T "Technical Specifications"				
Push-in lugs					
 3RP19 03	For screw fixing of 3RB22/3RB23 overload relays	--	3RP19 03	10 units	0.002
 3RB19 00-0B	For screw mounting of 3RB29 06 current measuring modules (2 units are required per module)	S00 ... S3	3RB19 00-0B	10 units	0.100

For more accessories (tools for spring-loaded terminals and labeling plates), see page 3/57.

1) Only for 3RB20/3RB21. The accessories are identical to those of the 3RU11 thermal overload relays.

2) In the scope of supply for 3RT10 54-1 contactors (55 kW).

Overview

Overload relays for standard applications

The following accessories are available for the 3RB20/3RB21 solid-state overload relays:

- One terminal bracket each for the overload relays size S00 and S0 (sizes S2 to S12 can be installed as stand-alone installation without a terminal bracket)
- One mechanical remote RESET module for all sizes
- One cable release for resetting devices which are difficult to access (for all sizes)
- One sealable cover for all sizes
- Box terminal blocks for sizes S6 and S10/S12
- Terminal covers for sizes S2 to S10/S12

Overload relays for High-Feature applications

The following accessories are available for the 3RB22/3RB23 solid-state overload relays:

- A sealable cover for the evaluation module
- Box terminal blocks for the current measuring modules size S6 and S10/S12
- Terminal covers for the current measuring modules size S6 and S10/S12

Technical specifications

Terminal brackets for stand-alone installation

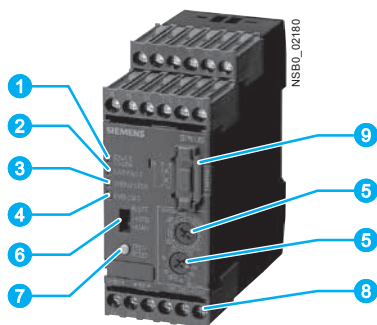
Type	3RB29 13-0AA1	3RB29 23-0AA1
For overload relay	3RB20 16, 3RB21 13	3RB20 26, 3RB21 23
Size	S00	S0
Type of mounting	For screw and snap-on mounting onto TH35 standard mounting rail	
Connection for main circuit		
Connection type	Screw terminal	
Screw terminal		
• Terminal screw	Pozidriv size 2	
• Tightening torque	Nm 0.8 ... 1.2	2 ... 2.5
• Conductor cross-section (min./max.), 1 or 2 conductors		
- Solid	mm ² 1 × (0.5 ... 2.5), Max. 1 × (... 4)	1 × (1 ... 6), Max. 1 × (... 10)
- Finely stranded without end sleeve	mm ² --	--
- Finely stranded with end sleeve	mm ² 1 × (0.5 ... 2.5)	1 × (1 ... 6)
- Stranded	mm ² 1 × (0.5 ... 2.5), Max. 1 × (... 4)	1 × (1 ... 6), Max. 1 × (... 10)
- AWG conductors, solid or stranded	AWG 1 × (18 ... 14)	1 × (14 ... 10)

Overload Relays

3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A
for High-Feature applications

Overview



- 1 Green LED "DEVICE/IO-Link":
A continuous green light signals that the device is working correctly, a green flickering light signals the communication through IO-Link.
- 2 Red LED "GND FAULT":
A continuous red light signals an active ground-fault trip.
- 3 Red LED "THERMISTOR":
A continuous red light signals an active thermistor trip.
- 4 Red LED "OVERLOAD":
A continuous red light signals an active overload trip; a flickering red light signals an imminent trip (overload warning).
- 5 Motor current and trip class setting:
Setting the device to the motor current and to the required trip class dependent on the start-up conditions is easy with the two rotary switches.
- 6 Selector switch for manual/automatic RESET:
With this switch you can choose between manual and automatic RESET.
- 7 Test/RESET button:
Enables testing of all important device components and functions, plus resetting of the device after a trip when manual RESET is selected.
- 8 Connecting terminals (removable terminal block):
The generously sized terminals permit connection of two conductors with different cross-sections for the auxiliary, control and sensor circuits. Connection is possible with screw connection and alternatively with spring-type connection.
- 9 Plug-in point for operator panel:
enables connection of the 3RA69 35-0A operator panel.

SIRIUS 3RB24 evaluation module

The modular electronic overload relay 3RB24, which is powered via IO-Link (with monostable auxiliary contacts) up to 630 A (up to 820 A possible with a series transformer) have been designed for inverse-time delayed protection of loads with normal and heavy starting ("Function" see "Manual for SIRIUS 3RB24 Solid-State Overload Relay for IO-Link".) against excessive temperature rises due to overload, phase unbalance or phase failure. It comprises an evaluation unit, a current measuring module and a connecting cable. The evaluation module 3RB24 also offers an motor starter function: The contactors, which are connected via the auxiliary contacts, can also be actuated for operation via IO-Link. In this way, direct, reversing and star-delta starters up to 630 A (or 830 A) can be connected to the controller wirelessly via the IO-Link controller.

An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set rated motor current.

This current rise is detected by means of the current measuring module (see page 7/134) and electronically evaluated by the evaluation module which is connected to it. The evaluation electronics sends a signal to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor. The

break time depends on the ratio between the tripping current and current setting I_e and is stored in the form of a long-term stable tripping characteristic (see www.siemens.com/sirius/support → "Characteristic Curves"). The "tripped" status is signaled by means of a continuously illuminated red "OVERLOAD" LED and also reported as a group fault via IO-Link.

The LED indicates imminent tripping of the relay due to overload, phase unbalance or phase failure by flickering when the limit current has been violated. This warning can also be reported to the higher-level PLC via IO-Link at the 3RB24 overload relay.

In addition to the described inverse-time delayed protection of loads against excessive temperature rises, the 3RB24 solid-state overload relays also allow direct temperature monitoring of the motor windings (full motor protection) by connection with broken-wire interlock of a PTC sensor circuit. With this temperature-dependent protection, the loads can be protected against overheating caused indirectly by reduced coolant flow, for example, which cannot be detected by means of the current alone. In the event of overheating, the devices switch off the contactor, and thus the load, by means of the auxiliary contacts. The "tripped" status is signaled by means of a continuously illuminated "THERMISTOR" LED and also reported as a group fault via IO-Link.

To the loads against incomplete ground faults due to damage to the insulation, humidity, condensation, etc., to protect the electronic overload relay 3RB24 offer the possibility of internal ground-fault detection (for details see "Manual for SIRIUS 3RB24 Solid-State Overload Relay for IO-Link", not possible in conjunction with contactor assembly for wye-delta starting). In the event of a ground fault, the 3RB24 relays trip instantaneously.

The "tripped" status is signaled by means of a flashing red LED "Ground Fault" and reported at the overload relay 3RB24 as a group fault via IO-Link.

The reset after overload, phase unbalance, phase failure, thermistor or ground-fault tripping is performed manually by key on site, via IO-Link or by electrical remote RESET or automatically after the cooling time (motor model) or for thermistor protection after sufficient cooling. Power cuts in devices due to function monitoring (broken wire or short circuit on the thermistor) can only be reset on-site ("Function" see "Manual for SIRIUS 3RB24 Solid-State Overload Relay for IO-Link"). In conjunction with a function expansion module, the motor current measured by the microprocessor can be output in the form of an analog signal DC 4 to 20 mA for operating rotary coil instruments or for feeding into analog inputs of programmable logic controllers.

The current values can be transmitted to the higher-level controller via IO-Link.

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials.

They comply with all important worldwide standards and approvals.

Type of protection "increased safety EEx e and explosion-proof enclosure EEx d" in accordance with ATEX Directive 94/9/EC

The electronic overload relay 3RB24 (monostable) are suitable for the overload protection of explosion-proof motors of types of protection EEx e and EEx d.

They comply with the requirements of EN 60079-7 (Electrical apparatus for areas subject to explosion hazards - Increased safety "e" as well as for flameproof enclosure "d"); see www.siemens.com/sirius/atex.

EC type test certificate for Group II, Category (2) G/D has been submitted. On request.

• Revised •
10/18/15

Overload Relays

3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A
for High-Feature applications

1

2

3

Order No. scheme

Digit of the Order No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th
	□□□	□	□	□	□	–	□	□	□
Solid-state overload relays	3 R B								
SIRIUS 2nd generation		2							
Device series			□						
Size, rated operational current and power				□					
Version of the automatic RESET, electrical remote RESET					□				
Trip class (CLASS)						□			
Setting range of the overload release							□		
Connection methods								□	
Installation type									□
Example	3 R B	2	4	8	3	–	4	A	1

Note:

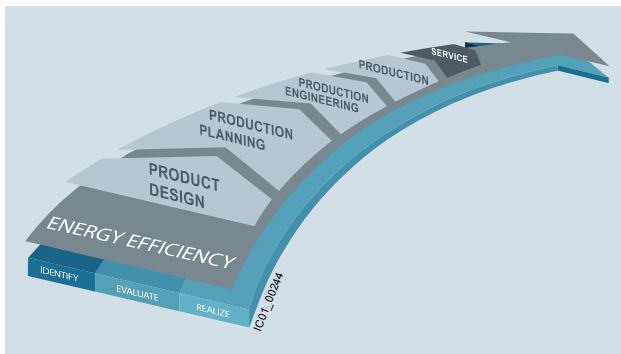
The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quoted in the catalog in the Selection and ordering data.

Benefits

The most important features and benefits of the 3RB24 solid-state overload relays for IO-Link are listed in the overview table (see "General Data", page 3/2 onwards).

Advantages through energy efficiency



Overview of the energy management process

We offer you a unique portfolio for industrial energy management, using an energy management system that helps to optimally define your energy needs. We split up our industrial energy management into three phases – Identification, Evaluation and Realization – and we support you with the appropriate hardware and software solutions in every process phase.

The innovative products of the SIRIUS industrial controls portfolio can also make a substantial contribution to a plant's energy efficiency (see www.siemens.com/sirius/energysaving).

3RB24 solid-state overload relays for IO-Link contribute to energy efficiency throughout the plant as follows:

- Transmission of current values
- Reduced inherent power loss
- Less heating of the control cabinet
- Smaller control cabinet air conditioners can be used

Application

Industries

The 3RB24 solid-state overload relays are suitable for customers from all industries who want to guarantee optimum inverse-time delayed and temperature-dependent protection of their electrical loads (e.g. motors) under normal and heavy starting conditions (CLASS 5 to 30), minimize project completion times, inventories and energy consumption, and optimize plant availability and maintenance management.

Application

The 3RB24 solid-state overload relays have been designed for the protection of three-phase asynchronous and single-phase AC motors.

In addition to protection function, these devices can be used together with contactors as direct or reversing starters (star-delta (wye-delta) start also possible), which are controlled via IO-Link. This makes it possible to directly control drives via IO-Link from a higher-level controller or on site via the optional hand-held device lamps and also, for example, to return current values directly via IO-Link.

If single-phase AC motors are to be protected by the 3RB24 solid-state overload relays, the main current paths of the current measuring modules must be series-connected ("Schematics" see "Manual for SIRIUS 3RB24 Solid-State Overload Relay for IO-Link").

Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive ambient conditions, ageing and temperature fluctuations.

For the temperature range from –25 °C to +60 °C, the 3RB24 solid-state overload relays compensate the temperature in accordance with IEC 60947-4-1.

Configuration notes for use of the devices below –25 °C or above +60 °C on request.

Overload Relays

3RB24 Solid-State Overload Relays

**3RB24 for IO-Link, up to 630 A
for High-Feature applications**

Selection and ordering data

3RB24 solid-state overload relays (evaluation module) for full motor protection, stand-alone installation, CLASS 5, 10, 20 and 30, adjustable

Type	3RB24 83-4A.1
Features and technical specifications	
Overload protection, phase failure protection and unbalance protection	✓
Supplied from an external voltage	✓ 24 V DC through IO-Link
Direct-on-line or reversing starters (wye-delta starting also possible) controllable through IO-Link	✓
Auxiliary contacts	✓ 1 CO and 1 NO in series
Manual and automatic RESET	✓
Remote-RESET	✓ (electrically or via IO-Link)
4 LEDs for operating and status displays	✓
TEST function and self-monitoring	✓
Internal ground-fault detection	✓
Screw or spring-type terminals for auxiliary, control and sensor circuits	✓
Input for PTC sensor circuit	✓
Analog output	✓
IO-Link-specific functions	
• Connection of direct-on-line, reversing and star-delta starters to the controller via IO-Link	✓
• On-site controlling of the starter using the hand-held device	✓
• Accessing process data (e.g. current values in all three phases) via IO-Link	✓
• Accessing parameterization and diagnostics data (e.g. tripped signals) via IO-Link	✓

✓ Available



PU (UNIT, SET, M) = 1
PS* = 1 unit
PG = 41G



3RB24 83-4AA1



3RB24 83-4AC1

Size of contactor	Version	Screw terminals 		Spring-type terminals 	
		Order No.	Price per PU	Order No.	Price per PU
Evaluation modules					
S00 ... S12	Monostable	3RB24 83-4AA1		3RB24 83-4AC1	

Notes:

- Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. The analog input module may not supply current to the analog output of the 3RB24 relay.

Current measuring modules and related connecting cables [see page 3/55](#), accessories [see pages 3/56 and 3/57](#).

Overload Relays

3RB24 Solid-State Overload Relays

Current measuring modules for
3RB22, 3RB23, 3RB24





1

2

3

Selection and ordering data

Current measuring modules for mounting onto contactor¹⁾ and stand-alone installation¹⁾²⁾ (essential accessories)

	Size con- tactor ³⁾	Rating for induction motor, ⁴⁾	Current set- ting of the inverse-time delayed overload release	Short-circuit pro- tection with fuse, type of coordina- tion "2", opera- tional class gG ⁵⁾	For over- load relays	DT	Order No.	Price per PU	PU (UNIT, SET, M)	Pack Units	PG
	kW	A	A								
Sizes S00/S0 ²⁾⁶⁾											
	S00/S0	0.09 ... 1.1	0.3 ... 3	20	3RB22 to	▶	3RB29 06-2BG1		1	1 unit	41G
		1.1 ... 11	2.4 ... 25	63	3RB24						
Sizes S2/S3 ²⁾⁶⁾											
	S2/S3	5.5 ... 45	10 ... 100	315	3RB22 to	▶	3RB29 06-2JG1		1	1 unit	41G
					3RB24						
Size S6 ¹⁾⁶⁾											
	S6 with busbar connection	11 ... 90	20 ... 200	315	3RB22 to	▶	3RB29 56-2TH2		1	1 unit	41G
	For mount- ing to S6 contactors with box terminals				3RB22 to	▶	3RB29 56-2TG2		1	1 unit	41G
					3RB24						
Sizes S10/S12 ¹⁾											
	S10/S12 and size 14 (3TF68/ 3TF69)	37 ... 450	63 ... 630	800	3RB22 to	▶	3RB29 66-2WH2		1	1 unit	41G
					3RB24						

Note:

The connecting cable between the current measuring module and the evaluation module is not included in the scope of supply; please order separately.

1) The current measuring modules with an Order No. ending with "2" are designed for mounting onto contactor and stand-alone installation. For 3TF68/3TF69 contactors, direct mounting is not possible.

2) The current measuring modules with an Order No. ending with "1" are designed for stand-alone installation.


3) Observe maximum rated operational current of the devices.

4) Guide value for 4-pole standard motors at 50 Hz 400 V AC. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

5) Maximum protection by fuse for overload relay, type of coordination "2".
"Fuse Values in Connection with Contactors" see
- "Configuration Manual for Configuring SIRIUS – Selection Data for Load Feeders in Fuseless and Fused Designs"
- "Configuration Manual for Configuring SIRIUS Innovations – Selection Data for Load Feeders in Fuseless and Fused Designs".

6) The modules with an Order No. with "G" in penultimate position are equipped with a straight-through transformer.

Accessories

Size of con- tactor	Version	For over- load relays	DT	Order No.	Price per PU	PU (UNIT, SET, M)	Pack Units	PG
Connecting cables (necessary accessories)								
	S00 ... S3	For connection between evaluation module and current measuring module • Length 0.1 m (only for mounting of the evaluation module directly onto the current measuring module)	3RB24, 3RB29	3RB29 87-2B		1	1 unit	41F
	S00 ... S12	• Length 0.5 m	3RB24, 3RB29	3RB29 87-2D		1	1 unit	41F

Additional general accessories see page 3/57.

Overload Relays

3RB24 Solid-State Overload Relays

Accessories for 3RB22, 3RB23, 3RB24

Overview


Overload relays for High-Feature applications

The following optional accessories are available for the 3RB22 to 3RB24 solid-state overload relays:

- Operator panel for the evaluation modules 3RB24
- Manual 3RB24
- Sealable cover for the evaluation modules 3RB22 to 3RB24
- Terminal covers for the 3RB29 current measuring modules sizes S6 and S10/S12
- Box terminal blocks for the 3RB29 current measuring modules sizes S6 and S10/S12
- Push-in lugs for screw fixing for 3RB22 to 3RB24 evaluation modules and 3RB29 06 current measuring modules

Selection and ordering data

Accessories for overload relay 3RB24

Version	For over-load relays	DT	Order No.	Price per PU	PU (UNIT, SET, M)	Pack Units	PG
Operator panels for evaluation modules							
 <p>3RA69 35-0A</p>	Operator panels (set)	3RB24	A	3RA69 35-0A	1	1 unit	42F
	1 set comprises:						
	• 1 x operator panel						
	• 1 x 3RA69 36-0A enabling module						
	• 1 x 3RA69 33-0B interface cover						
	• 1 x fixing terminal						
	<u>Note:</u>						
	The connecting cable between the evaluation module and the operator panel is not included in the scope of supply; please order separately.						
	Connecting cable	3RB24	▶	3UF79 33-0BA00-0	1	1 unit	42J
	Length 2 m (round), for connecting the evaluation module to the operator panel						
	Enabling modules (replacement)	3RB24	A	3RA69 36-0A	1	1 unit	42F
	Interface covers	3RB24	A	3RA69 33-0B	1	5 units	42F

¹⁾ The manual is also available as a free PDF download on the Internet at www.siemens.com/sirius/support → "Manuals/Operating Instructions".

Additional general accessories [see next page](#).





Overload Relays

3RB24 Solid-State Overload Relays


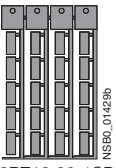
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Accessories for 3RB22, 3RB23, 3RB24

General accessories

Version	Size	For over-load relays	Order No.	PU (UNIT, SET, M)	Pack Units
Sealable covers for evaluation modules					
	For covering the setting knobs	--	3RB22 to 3RB24	3RB29 84-2	1 10 units
Terminal covers for current measuring modules					
Covers for cable lugs and busbar connections					
• Length 100 mm	S6	3RB29 56	3RT19 56-4EA1	1	1 unit
• Length 120 mm	S10/S12	3RB29 66	3RT19 66-4EA1	1	1 unit
Covers for box terminals					
• Length 25 mm	S6	3RB29 56	3RT19 56-4EA2	1	1 unit
• Length 30 mm	S10/S12	3RB29 66	3RT19 66-4EA2	1	1 unit
Covers for screw terminals					
between contactor and overload relay, without box terminals	S6	3RB29 56	3RT19 56-4EA3	1	1 unit
(1 unit required per combination)	S10/S12	3RB29 66	3RT19 66-4EA3	1	1 unit
Box terminal blocks for current measuring modules					
	For round and ribbon cables				
• Up to 70 mm ²	S6 ¹⁾	3RB29 56	3RT19 55-4G	1	1 unit
• Up to 120 mm ²	S6	3RB29 56	3RT19 56-4G	1	1 unit
• Up to 240 mm ²	S10/S12	3RB29 66	3RT19 66-4G	1	1 unit
Technical specifications for conductor cross-sections see "Reference Manual for Protection Equipment-3RU1, 3RB2 Overload Relays".					
Push-in lugs for evaluation modules and current measuring modules					
	For screw fixing the evaluation modules	--	3RB22 to 3RB24	3RP19 03	1 10 units
	For screw fixing the current measuring modules (2 units per module)	S00 ... S3	3RB29 06	3RB19 00-0B	100 10 units

¹⁾ In the scope of supply for 3RT10 54-1 contactors (55 kW).

Version	Size	Color	For over-load relays	Order No.	PU (UNIT, SET, M)	Pack Units
Tools for opening spring-type terminals						
	Screwdrivers For all SIRIUS devices with spring-type terminals	Length approx. 200 mm, 3.0 mm x 0.5 mm	Titanium gray/black, partially insulated	Main and auxiliary circuit connection: 3RB2	3RA29 08-1A	1 1 unit
Blank labels						
	Unit labeling plates¹⁾ for SIRIUS devices	20 mm x 7 mm 20 mm x 7 mm	Titanium gray Pastel turquoise	3RB24 3RB22, 3RB23	3RT29 00-1SB20 3RT29 00-1SB20	100 340 units 100 340 units

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH (see "Appendix" → "External Partners").

Overload Relays

3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A
for High-Feature applications

Technical specifications

Type – Overload relay of evaluation modules		3RB24 83-4A.1
Size of contactor		S00 ... S10/S12
General data		
Trips in the event of		Overload, phase failure and phase unbalance (> 40 % according to NEMA), + ground fault (connectable and disconnectable) and activation of the thermistor motor protection (with closed PTC sensor circuit)
Trip class acc. to IEC 60947-4-1	CLASS	5, 10, 20 and 30 adjustable
Phase failure sensitivity		Yes
Overload warning		Yes, from $1.125 \times I_e$ for symmetrical loads and from $0.85 \times I_e$ for unsymmetrical loads
Reset and recovery		Manual and automatic RESET, electrical remote RESET or through IO-Link
<ul style="list-style-type: none"> Reset options after tripping Recovery time <ul style="list-style-type: none"> - For automatic RESET 	min	<ul style="list-style-type: none"> - for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature
<ul style="list-style-type: none"> - For manual RESET 	min	<ul style="list-style-type: none"> - for tripping due to a ground fault: no automatic RESET - for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: Immediately
<ul style="list-style-type: none"> - For remote RESET 	min	<ul style="list-style-type: none"> - for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: Immediately
Features		
<ul style="list-style-type: none"> Display of operating state on device 		Yes, with 4 LEDs <ul style="list-style-type: none"> - Green LED "DEVICE/IO-Link" - Red "Ground Fault" LED - Red "Thermistor" LED - Red "Overload" LED
<ul style="list-style-type: none"> TEST function 		Yes, test of LEDs, electronics, auxiliary contacts and wiring of control circuit by pressing the button TEST/RESET / self-monitoring
<ul style="list-style-type: none"> RESET button STOP button 		Yes, with the TEST/RESET button No
Explosion protection – Safe operation of motors with "increased safety EEx e and explosion-proof enclosure EEx d" type of protection		
EC type test certificate number according to directive 94/9/EC (ATEX)		On request
Ambient temperatures		
<ul style="list-style-type: none"> Storage/transport 	°C	-40 ... +80
<ul style="list-style-type: none"> Operation 	°C	-25 ... +60
<ul style="list-style-type: none"> Temperature compensation 	°C	+60
<ul style="list-style-type: none"> Permissible rated current 		
<ul style="list-style-type: none"> - Temperature inside control cabinet 60 °C 	%	100
<ul style="list-style-type: none"> - Temperature inside control cabinet 70 °C 	%	On request
Repeat terminals		
<ul style="list-style-type: none"> Coil repeat terminals 		Not required
<ul style="list-style-type: none"> Auxiliary contact repeat terminal 		Not required
Degree of protection acc. to IEC 60529		IP20: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with the cover
Touch protection acc. to IEC 61140		Finger-safe: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with the cover
Shock resistance with sine acc. to IEC 60068-2-27	g/ms	15/11
Electromagnetic compatibility (EMC) – Interference immunity		
<ul style="list-style-type: none"> Conductor-related interference 		
<ul style="list-style-type: none"> - Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3) 	kV	2 (power ports), 1 (signal ports)
<ul style="list-style-type: none"> - Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3) 	kV	2 (line to earth), 1 (line to line)
<ul style="list-style-type: none"> Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3) 	kV	8 (air discharge), 6 (contact discharge)
<ul style="list-style-type: none"> Field-related interference according to IEC 61000-4-3 (corresponds to degree of severity 3) 	V/m	10
Electromagnetic compatibility (EMC) – emitted interference		Degree of severity A according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)
Resistance to extreme climates – air humidity	%	100
Dimensions		"Dimensional drawings" see "Manual for SIRIUS 3RB24 Solid-State Overload Relay for IO-Link" .
Installation altitude above sea level	m	Up to 2000
Mounting position		Any
Type of mounting		
<ul style="list-style-type: none"> Evaluation modules Current measuring module 	Size	Stand-alone installation S00 to S3: Stand-alone installation, S6 and S10/S12: stand-alone installation or mounting onto contactors

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Overload Relays

3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A
for High-Feature applications

1

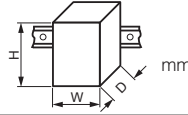
2

3

Type – Overload relay of evaluation modules

Size of contactor

Dimensions of evaluation modules (W x H x D)



3RB24 83-4A.1

S00 ... S10/S12

45 x 111 x 95

Auxiliary circuit

Number of auxiliary switches

1 CO contact, 1 NO contact connected in series internally

Auxiliary contacts – assignment

- 1 CO contact for selecting the contactor (for reversing starter function), actuated by the control system
- 1 NO contact for normal switching duty, actuated by the control system (opens automatically when tripping occurs)

Rated insulation voltage U_i (pollution degree 3)

V

300

Rated impulse withstand voltage U_{imp}

kV

4

Auxiliary contacts – contact rating

- NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e
 - 24 V A 6
 - 120 V A 6
 - 125 V A 6
 - 250 V A 3
- NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e
 - 24 V A 6
 - 120 V A 6
 - 125 V A 6
 - 250 V A 3
- NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e
 - 24 V A 2
 - 60 V A 0.55
 - 110 V A 0.3
 - 125 V A 0.3
 - 250 V A 0.2
- Conventional thermal current I_{th} A 5
- Contact reliability (suitability for PLC control; 17 V, 5 mA) Yes

Short-circuit protection

- With fuse, operational class gG A 6
- With miniature circuit breaker, C characteristic A 1.6

Protective separation between auxiliary conducting paths acc. to IEC 60947-1

V

300

CSA, UL, UR rated data

Auxiliary circuit – switching capacity

B300, R300

Conductor cross-sections of the auxiliary circuit

Connection type

 Screw terminals

Terminal screw

M3, Pozidriv size 2

Operating devices

mm

3.0 x 0.5

Prescribed tightening torque

Nm

0.8 ... 1.2

Conductor cross-sections (min./max.), 1 or 2 conductors can be connected

- Solid mm² 1 x (0.5 ... 4)¹⁾, 2 x (0.5 ... 2.5)¹⁾
- Finely stranded without end sleeve mm² --
- Finely stranded with end sleeve mm² 1 x (0.5 ... 2.5)¹⁾, 2 x (0.5 ... 1.5)¹⁾
- Stranded mm² --
- AWG cables, solid or stranded AWG 2 x (20 ... 14)

Connection type

 Spring-type terminals

Operating devices

mm

3.0 x 0.5

Conductor cross-sections (min./max.), 1 or 2 conductors can be connected

- Solid mm² 2 x (0.25 ... 1.5)
- Finely stranded without end sleeve mm² --
- Finely stranded with end sleeve mm² 2 x (0.25 ... 1.5)
- AWG cables, solid or stranded AWG 2 x (24 ... 16)



1) If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified

Overload Relays

3RB24 Solid-State Overload Relays

3RB24 for IO-Link, up to 630 A
for High-Feature applications

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Type – Overload relay of evaluation modules		3RB24 83-4A.1
Size of contactor		S00 ... S10/S12
Control and sensor circuit as well as the analog output		
Rated insulation voltage U_i (pollution degree 3)	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Rated control supply voltage U_s		
• DC	V	24 through IO-Link
Operating range		
• DC		$0.85 \times U_{s\ min} \leq U_s \leq 1.1 \times U_{s\ max}$
Rated power		
• DC	W	0.5
Mains buffering time	ms	200
Thermistor motor protection (PTC thermistor detector)		
• Summation cold resistance	k Ω	≤ 1.5
• Response value	k Ω	3.4 ... 3.8
• Return value	k Ω	1.5 ... 1.65
Ground-fault detection		The information refers to sinusoidal residual currents at 50/60 Hz.
• Tripping value I_A		
- For $0.3 \times I_e < I_{motor} < 2.0 \times I_e$		$> 0.3 \times I_e$
- For $2.0 \times I_e < I_{motor} < 8.0 \times I_e$		$> 0.15 \times I_{motor}$
• Response time t_{trip}	ms	500 ... 1 000
Analog output¹⁾		
• Output signal	mA	4 ... 20
• Measuring range		
		$0 \dots 1.25 \times I_e$
		4 mA corresponds to $0 \times I_e$
		16.8 mA corresponds to $1.0 \times I_e$
		20 mA corresponds to $1.25 \times I_e$
• Load, max.	Ω	100
Conductor cross-sections for the control and sensor circuit as well as the analog output		
Connection type		 Screw terminals
Terminal screw		M3, Pozidriv size 2
Operating devices	mm	3.0 x 0.5
Prescribed tightening torque	Nm	0.8 ... 1.2
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm ²	$1 \times (0.5 \dots 4)^2, 2 \times (0.5 \dots 2.5)^2$
• Finely stranded without end sleeve	mm ²	—
• Finely stranded with end sleeve	mm ²	$1 \times (0.5 \dots 2.5)^2, 2 \times (0.5 \dots 1.5)^2$
• Stranded	mm ²	—
• AWG cables, solid or stranded	AWG	$2 \times (20 \dots 14)$
Connection type		 Spring-type terminals
Operating devices	mm	3.0 x 0.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm ²	$2 \times (0.25 \dots 1.5)$
• Finely stranded without end sleeve	mm ²	—
• Finely stranded with end sleeve	mm ²	$2 \times (0.25 \dots 1.5)$
• Stranded	mm ²	$2 \times (0.25 \dots 1.5)$
• AWG cables, solid or stranded	AWG	$2 \times (24 \dots 16)$

1) Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. The analog input module may not supply current to the analog output of the 3RB24 overload relay.

2) If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

Overload Relays

3RB24 Solid-State Overload Relays

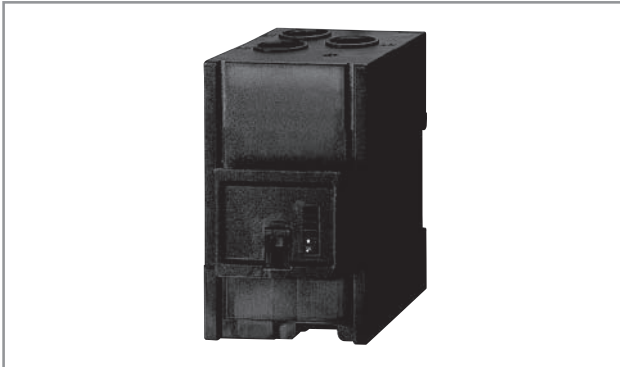
Current measuring modules for
3RB22, 3RB23, 3RB24

1

2

3

Overview



SIRIUS 3RB29 06 current measuring module

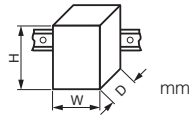
The current measuring modules are designed as system components for connecting to evaluation units 3RB22 to 3RB24. Using these evaluation units the motor current is measured and the measured value sent to the evaluation unit for evaluation. The current measuring modules in sizes S00 to S3 up to 55 mm wide are equipped with straight-through transformers and can be snap-fitted under the evaluation units. The larger evaluation units are installed directly on the contactor or as stand-alone units.

Technical specifications

Type – Overload relays: Current measuring modules

Size of contactor

Dimensions of current measuring modules
(W x H x D)



mm

3RB29 06	3RB29 56	3RB29 66
S00/S0	S2/S3	S6
45 x 84 x 45	55 x 94 x 72	120 x 119 x 145
		145 x 147 x 148

Main circuit

Rated insulation voltage U_i
(pollution degree 3)

V

1 000

Rated impulse withstand voltage U_{imp}

kV

6

8

Rated operational voltage U_e

V

1 000

Type of current

- Direct current
- Alternating current

No

Yes, 50/60 Hz $\pm 5\%$

Current setting

A

0.3 ... 3;
2.4 ... 25

10 ... 100

20 ... 200

63 ... 630

Power loss per unit (max.)

W

0.5

Short-circuit protection

- With fuse without contactor
- With fuse and contactor

See "Selection and ordering data" on page 3/55.

See

- "Configuration Manual for Configuring SIRIUS – Selection Data for Load Feeders in Fuseless and Fused Designs"
- "Configuration Manual for Configuring SIRIUS Innovations – Selection Data for Load Feeders in Fuseless and Fused Designs"

Protective separation between main and auxiliary conducting paths V
acc. to IEC 60947-1 (pollution degree 2)

690 for grounded networks, otherwise 600

Overload Relays

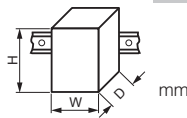
3RB24 Solid-State Overload Relays

Current measuring modules for 3RB22, 3RB23, 3RB24

Type – Overload relays: Current measuring modules

Size of contactor

Dimensions of current measuring modules (W x H x D)



Conductor cross-sections of the main circuit

Connection type

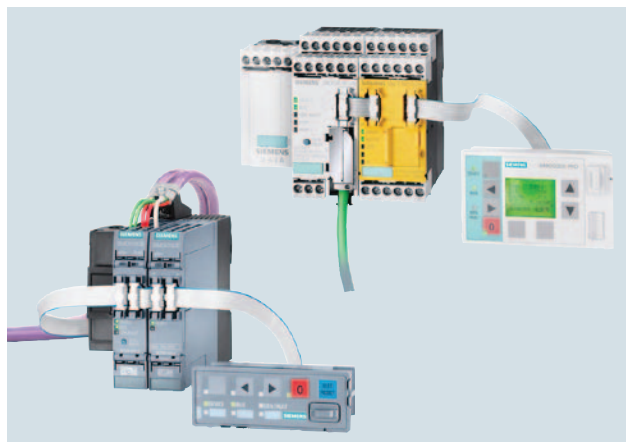
Screw terminals with box terminal

		3RB29 06	3RB29 56	3RB29 66
		S00/S0	S2/S3	S6
		45 x 84 x 45	55 x 94 x 72	120 x 119 x 145
		145 x 147 x 148		
		Screw terminals with box terminal		
Terminal screw	mm	—	4 mm Allen screw	5 mm Allen screw
Operating devices	mm	—	4 mm Allen screw	5 mm Allen screw
Prescribed tightening torque	Nm	—	10 ... 12	20 ... 22
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid	mm ²	—	—	—
• Finely stranded without end sleeve	mm ²	—	With 3RT19 55-4G box terminal: 2 x (1 x max. 50, 1 x max. 70), 1 x (10 ... 70)	2 x (50 ... 185), rear clamping point only: 1 x (70 ... 240)
			With 3RT19 56-4G box terminal: 2 x (1 x max. 95, 1 x max. 120), 1 x (10 ... 120)	Rear clamping point only: 1 x (120 ... 185)
• Finely stranded with end sleeve	mm ²	—	With 3RT19 55-4G box terminal: 2 x (1 x max. 50, 1 x max. 70), 1 x (10 ... 70)	2 x (50 ... 185), rear clamping point only: 1 x (70 ... 240)
			With 3RT19 56-4G box terminal: 2 x (1 x max. 95, 1 x max. 120), 1 x (10 ... 120)	Rear clamping point only: 1 x (120 ... 185)
• Stranded	mm ²	—	With 3RT19 55-4G box terminal: 2 x (max. 70), 1 x (16 ... 70)	2 x (70 ... 240), rear clamping point only: 1 x (95 ... 300)
			With 3RT19 56-4G box terminal: 2 x (max. 120), 1 x (16 ... 120)	Rear clamping point only: 1 x (120 ... 240)
• AWG cables, solid or stranded	AWG	—	With 3RT19 55-4G box terminal: 2 x (max. 1/0), 1 x (6 ... 2/0)	2 x (2/0 ... 500 kcmil), rear clamping point only: 1 x (3/0 ... 600 kcmil)
			With 3RT19 56-4G box terminal: 2 x (max. 3/0), 1 x (6 ... 250 kcmil)	Rear clamping point only: 1 x (250 kcmil ... 500 kcmil)
• Ribbon cables (number x width x thickness)	mm	—	With 3RT19 55-4G box terminal: 2 x (6 x 15.5 x 0.8), 1 x (3 x 9 x 0.8 ... 6 x 15.5 x 0.8)	2 x (20 x 24 x 0.5), 1 x (6 x 9 x 0.8 ... 20 x 24 x 0.5)
			With 3RT19 56-4G box terminal: 2 x (10 x 15.5 x 0.8), 1 x (3 x 9 x 0.8 ... 10 x 15.5 x 0.8)	
		Busbar connections		
Terminal screw	—	—	M8 x 25	M10 x 30
Prescribed tightening torque	Nm	—	10 ... 14	14 ... 24
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid with cable lug	mm ²	—	16 ... 95 ¹⁾	50 ... 240 ²⁾
• Stranded with cable lug	mm ²	—	25 ... 120 ¹⁾	70 ... 240 ²⁾
• AWG cable, solid or stranded, with cable lug	AWG	—	4 ... 250 kcmil	2/0 ... 500 kcmil
• with connecting bar (max. width)	mm	—	17	25
		Straight-through transformers		
Diameter of opening	mm	7.5	14	25

¹⁾ When connecting cable lugs according to DIN 46235 with conductor cross-sections of 95 mm² and more, the 3RT19 56-4EA1 terminal cover must be used to ensure phase spacing.

²⁾ When connecting cable lugs according to DIN 46234 with conductor cross-sections of 240 mm² and more as well as to DIN 46235 with conductor cross-sections of 185 mm² and more, the 3RT19 56-4EA1 terminal cover must be used for to keep the phase clearance.

Overview



SIMOCODE pro S for efficient entry into motor management and SIMOCODE pro V for maximum functionality

SIMOCODE pro is a flexible, modular motor management system for motors with constant speeds in the low-voltage performance range. It optimizes the connection between I&C and motor feeder, increases plant availability and allows significant savings to be made for installation, commissioning, operation and maintenance of a system.

When SIMOCODE pro is installed in the low-voltage switchboard, it is the intelligent interface between the higher-level automation system and the motor feeder and includes the following:

- Multifunctional, electronic full motor protection that is independent of the automation system
- Integrated control functions instead of hardware for the motor control
- Detailed operating, service and diagnostics data
- Open communication through PROFIBUS DP, PROFINET and OPC UA
- Safety relay function for the fail-safe disconnection of motors up to SIL 3 (IEC 61508, IEC 62061) or PL e with Category 4 (EN ISO 13849-1)
- SIMOCODE ES is the software package for SIMOCODE pro parameterization, start up and diagnostics.

Device series

SIMOCODE pro is structured into several functionally tiered series:

- SIMOCODE pro C, as a compact system for direct-on-line starters and reversing starters or for controlling a motor starter protector
- SIMOCODE pro S - the smart system for direct-on-line, reversing, and wye-delta starters or for controlling a motor starter protector or soft starter. Its expandability with a multifunction module provides comprehensive input/output project data volume, precise ground-fault detection via the 3UL23 residual-current transformers and temperature measurement.
- SIMOCODE pro V, as a variable system with all control functions and with the possibility of expanding the inputs, outputs and functions of the system at will using expansion modules

Expansion possibilities	SIMOCODE			
	pro C PROFIBUS	pro S PROFIBUS	pro V ¹⁾ PROFIBUS ²⁾	PROFINET
Operator panels	✓	✓	✓	✓
Operator panels with display	--	--	✓	✓
Current measuring modules	✓	✓	✓	✓
Current/voltage measuring modules	--	--	✓	✓
Decoupling modules	--	--	✓	✓
Expansion modules:				
• Digital modules	--	--	2	2
• Fail-safe digital modules ³⁾	--	--	1	1
• Analog modules	--	--	1	2
• Ground-fault modules	--	--	1	1
• Temperature modules	--	--	1	2
• Multifunction modules	--	1	--	--

✓ Available

-- Not available

¹⁾ Maximum of 5 expansion modules.

²⁾ When an operator panel with display and/or a decoupling module are used, more restrictions on the number of expansion modules connectable per basic unit must be observed, [see page 10/13](#).

³⁾ The fail-safe digital module can be used instead of one of the two digital modules.

Per feeder each system always comprises one basic unit and one separate current measuring module. The two modules are connected together electrically through the system interface with a connection cable and can be mounted mechanically connected as a unit (one behind the other) or separately (side by side). The motor current to be monitored is decisive only for the choice of the current measuring module.

An operator panel for mounting in the control cabinet door is optionally connectable through a second system interface on the basic unit. Both the current measuring module and the operator panel are electrically supplied by the basic unit through the connection cable. More inputs, outputs and functions can be added to the SIMOCODE pro V and SIMOCODE pro S by means of optional expansion modules, thus supplementing the inputs and outputs already existing on the basic unit. With the DM-F Local and DM-F PROFIsafe fail-safe digital modules it is also possible to integrate the fail-safe disconnection of motors in the SIMOCODE pro V motor management system.

All modules are connected by connection cables. The connection cables are available in various lengths. The maximum distance between the modules (e.g. between the basic unit and the current measuring module) must not exceed 2.5 m. The total length of all the connection cables per system interface of the basic unit may be up to 3 m.

Article No. scheme

Digit of the Article No.	1st - 4th	5th	6th	7th	8th	9th	10th	11th	12th	13th		
	□□□□	□	□	□	–	1	□	□	0	□	–	0
SIMOCODE pro motor management system	3 U F 7											
Type of unit/module		□										
Functional version of the unit/module			□	□								
Connection type of the current transformer						□						
Voltage version							□					
Color									□			
Example	3 U F 7	0	1	0	–	1	A	B	0	0	–	0

Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the catalog in the Selection and ordering data.

Benefits

General customer benefits

- Integrating the whole motor feeder into the process control by means of PROFIBUS DP, PROFINET or OPC UA significantly reduces the wiring outlay between the motor feeder and PLC
- Decentralization of the automated processes by means of configurable control and monitoring functions in the feeder saves resources in the automation system and ensures full functionality and protection of the feeder even if the I&C or bus system fails
- The acquisition and monitoring of operating, service and diagnostics data in the feeder and process control system increases plant availability as well as maintenance and service-friendliness
- The high degree of modularity allows users to perfectly implement their plant-specific requirements for each motor feeder
- The SIMOCODE pro system offers functionally graded and space-saving solutions for each customer application
- The replacement of the control circuit hardware with integrated control functions decreases the number of hardware components and wiring required and in this way limits stock keeping costs and potential wiring errors
- The use of electronic full motor protection permits better utilization of the motors and ensures long-term stability of the tripping characteristic and reliable tripping even after years of service

Multifunctional, electronic full motor protection for rated motor currents up to 820 A

SIMOCODE pro offers comprehensive protection of the motor feeder by means of a combination of different, multi-step and delayable protection and monitoring functions:

- Inverse-time delayed electronic overload protection (CLASS 5 to 40)
- Thermistor motor protection
- Phase failure/unbalance protection
- Stall protection
- Monitoring of adjustable limit values for the motor current
- Voltage and power monitoring
- Monitoring of the power factor (motor idling/load shedding)
- Ground-fault monitoring
- Temperature monitoring, e.g. over PT100/PT1000
- Monitoring of operating hours, downtime and number of starts etc.

Recording of measuring curves

SIMOCODE pro can record measuring curves and therefore is able, for example, to present the progression of motor current during motor start up.

Flexible motor control implemented with integrated control functions (instead of comprehensive hardware interlocks)

Many predefined motor control functions have already been integrated into SIMOCODE pro, including all necessary logic operations and interlocks:

- Overload relays
- Direct-on-line and reversing starters
- Wye/delta starters (also with direction reversal)
- Two speeds, motors with separate windings (pole-changing starter); also with direction reversal
- Two speeds, motors with separate Dahlander windings (also with direction reversal)
- Positioner actuation
- Solenoid valve actuation
- Actuation of a motor starter protector
- Soft starter actuation (also with direction reversal)

These control functions are predefined in SIMOCODE pro and can be freely assigned to the inputs and outputs of the device (including PROFIBUS/PROFINET).

These predefined control functions can also be flexibly adapted to each customized configuration of a motor feeder by means of freely configurable logic modules (truth tables, counters, timers, edge evaluation, etc.) and with the help of standard functions (power failure monitoring, emergency start, external faults, etc.), without additional auxiliary relays being necessary in the control circuit.

SIMOCODE pro makes a lot of additional hardware and wiring in the control circuit unnecessary which results in a high level of standardization of the motor feeder in terms of its design and circuit diagrams.

• Revised •
10/18/15

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3

SIMOCODE pro 3UF7 motor management and control devices

Detailed operational, service and diagnostics data

SIMOCODE pro makes different operating, service and diagnostics data available and helps to detect potential faults in time and to prevent them by means of preventative measures. In the event of a malfunction, a fault can be diagnosed, localized and rectified very quickly – there are no or very short downtimes.

Operating data

- Motor switching state derived from the current flow in the main circuit
- All phase currents
- All phase voltages and phase-to-phase voltages
- Active power, apparent power and power factor
- Phase unbalance and phase sequence
- Ground-fault current
- Time to trip
- Motor temperature
- Remaining cooling time etc.

Service data

- Motor operating hours
- Motor stop times
- Number of motor starts
- Number of overload trips
- Interval for compulsory testing of the enabling circuits
- Energy consumed
- Internal comments stored in the device etc.

Diagnostics data

- Numerous detailed early warning and fault messages
- Internal device fault logging with time stamp
- Time stamping of freely selectable status, alarm or fault messages etc.

Easy operation and diagnostics

Operator panel

The operator panel is used to control the motor feeder and can replace all conventional pushbuttons and indicator lights to save space. It makes SIMOCODE pro or the feeder directly operable in the control cabinet. It features all the status LEDs available on the basic unit and externalizes the system interface for simple parameterization or diagnosis on a PC/PG.

Operator panel with display

As an alternative to the 3UF720 standard operator panel for SIMOCODE pro V, there is also an operator panel with display: the 3UF721 is thus able in addition to indicate current measured values, operational and diagnostics data or status information of the motor feeder at the control cabinet. The pushbuttons of the operator panel can be used to control the motor. Also, when SIMOCODE pro V PROFINET is used it is possible to set parameters such as rated motor current, limit values, etc. directly via the operator panel with display.

Communications

SIMOCODE pro has either an integrated PROFIBUS DP interface (SUB-D or terminal connection) or a PROFINET interface (2 x RJ45).

Fail-safe disconnection through PROFIBUS or PROFINET with the PROFIsafe profile is also possible in conjunction with a fail-safe controller (F-CPU) and the DM-F PROFIsafe fail-safe digital module.

SIMOCODE pro for PROFIBUS

SIMOCODE pro for PROFIBUS supports for example:

- Cyclic services (DPV0) and acyclic services (DPV1)
- Extensive diagnostics and hardware interrupts
- Time stamp with high timing precision (SIMATIC S7) for SIMOCODE pro V
- DPV1 communication after the Y-Link

SIMOCODE pro for PROFINET

SIMOCODE pro for PROFINET supports for example:

- Line and ring bus topology thanks to an integrated switch
- Media redundancy via MRP protocol
- Operating, service and diagnostics data via standard web browser
- OPC UA server for open communication with visualization and control system
- NTP-synchronized time
- Interval function and measured values for power management via PROFlenergy
- Module exchange without PC memory module through proximity detection
- Extensive diagnostics and maintenance alarms

System redundancy with SIMOCODE pro for PROFINET

The device supports the system redundancy mechanisms of PROFINET IO and therefore can be operated directly on fault-tolerant systems such as SIMATIC S7-400 H. As such, SIMOCODE pro can provide decisive added value also for the field level of plants in which plant availability and control system redundancy are priorities.

Notes on safety

For connection of an internal system to an external system, suitable protective measures must be taken to ensure safe operation of the plant (including IT security, e.g. network segmentation).

More information, see www.siemens.com/industrialsecurity.

For SIMOCODE pro motor management and control devices with communication function, see page 10/14 onwards.

Accessories, see page 10/19 onwards.

More information, see Chapter 14 "Parameterization, Configuration and Visualization with SIRIUS" or Industry Mall.

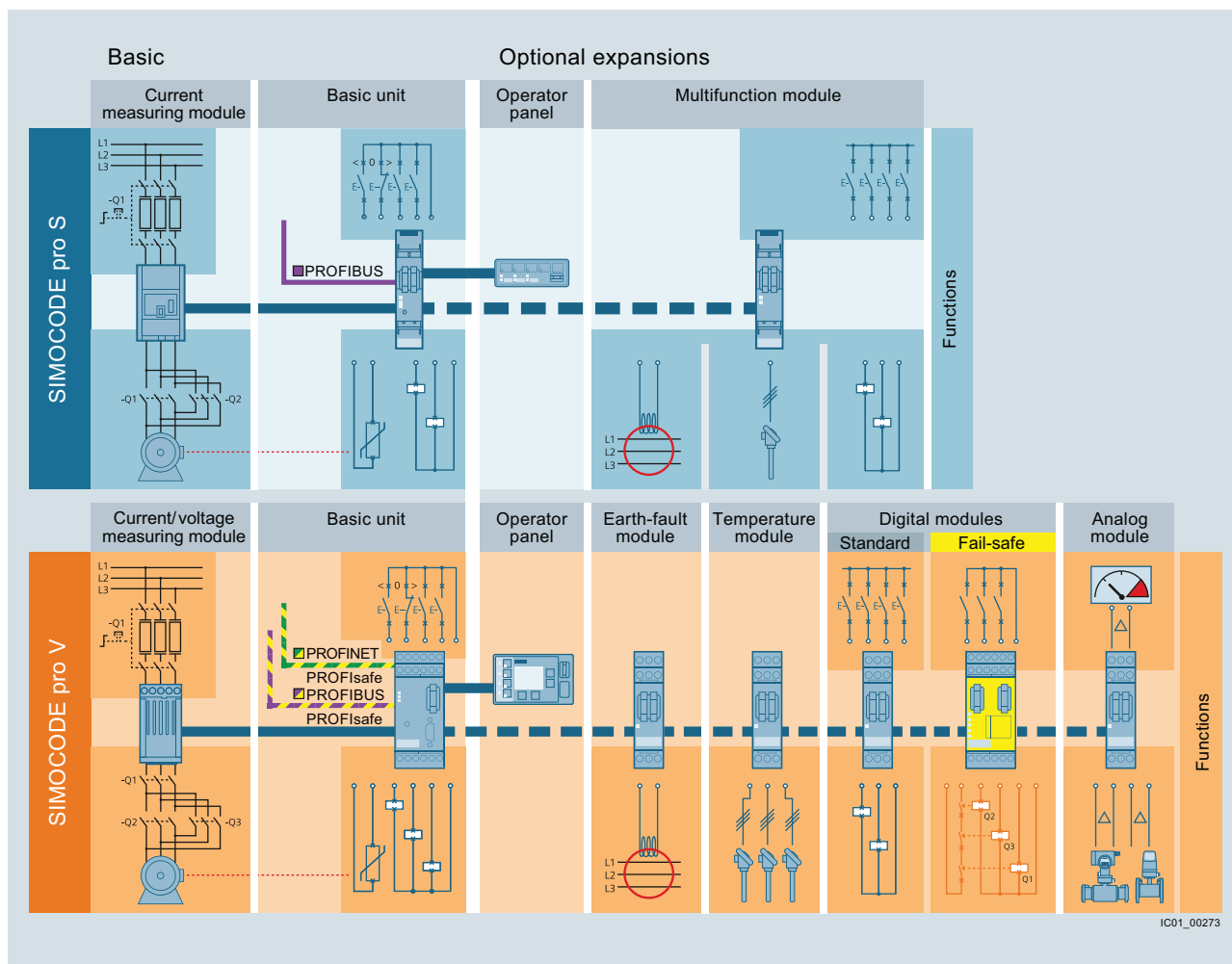
Autonomous operation

An essential feature of SIMOCODE pro is the autonomous execution of all protection and control functions, even when communication to the I&C system is interrupted. This means that even in the event of bus system or automation system failure, full functionality of the feeder is ensured or a specific behavior can be parametrized in case of such a fault, e.g. targeted shutdown of the feeder or execution of particular parametrized control mechanisms (such as reversal of the direction of rotation).

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7
motor management and control devices

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SIMOCODE pro V and SIMOCODE pro S: System structure

• Revised •
10/18/15

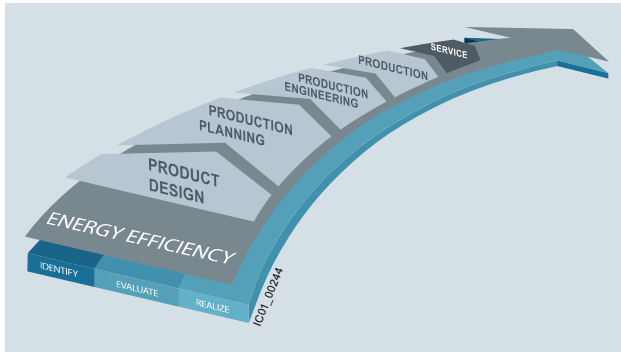
SIMOCODE pro 3UF7 motor management and control devices

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3

Advantages through energy efficiency



Overview of the energy management process

We offer you a unique portfolio for industrial energy management, using an energy management system that helps to optimally define your energy needs. We split up our industrial energy management into three phases – identify, evaluate, and realize – and we support you with the appropriate hardware and software solutions in every process phase.

The innovative SIRIUS industrial controls products can also make a major contribution to the energy efficiency of a plant (www.siemens.com/sirius/energysaving).

The SIMOCODE pro 3UF7 motor management system makes the following contribution to the energy efficiency of the plant as a whole:

- **Energy consumption:**
Clear display of the energy consumption of a motor feeder or process element by means of the acquisition and transmission of all operating and consumption data, such as current, voltage, active and reactive power, energy consumption, motor temperature etc.
- **Energy management:**
Evaluation of energy measured values (e.g. limit value monitoring) with exporting of local or central actions (= forwarding to higher-level)
- **PROFInergy:**
SIMOCODE pro V PROFINET supports the PROFInergy functions. Reduced energy consumption thanks to automatic disconnection in the intervals and forwarding of the measured values for higher-level energy management systems.

Application

SIMOCODE pro is often used for automated processes where plant downtimes are very expensive (e.g. steel or cement industry) and where it is important to prevent plant downtimes through detailed operating, service and diagnostics data or to localize the fault very quickly in the event of a fault.

SIMOCODE pro is modular and space-saving and suited especially for operation in motor control centers (MCCs) in the process industry and for power plant technology.

Applications

Protection and control of motors in hazardous areas for types of protection EEx e/d according to ATEX guideline 94/9/EC

- With heavy starting (paper, cement, metal and water industries)
- In high-availability plants (chemical, oil, raw material processing industries, power plants)

Safety technology for SIMOCODE pro

The safe disconnection of motors in the process industry is becoming increasingly important as the result of new and revised standards and requirements in the safety technology field.

With the DM-F Local and DM-F PROFIsafe fail-safe expansion modules it is easy to integrate functions for fail-safe disconnection into the SIMOCODE pro V motor management system while retaining service-proven concepts. The strict separation of safety functions and operational functions proves particularly advantageous for planning, configuring and construction. Seamless integration in the motor management system leads to greater transparency for diagnostics and during operation of the system.

Suitable components for this purpose are the DM-F Local and DM-F PROFIsafe fail-safe expansion modules, depending on the requirements:

- The DM-F Local fail-safe digital module for when direct assignment between a fail-safe hardware shutdown signal and a motor feeder is required, or
- The DM-F PROFIsafe fail-safe digital module for when a fail-safe controller (F-CPU) creates the signal for the disconnection and transmits it in a fail-safe manner through PROFIBUS/PROFIsafe or PROFINET/PROFIsafe to the motor management system

More information

Configuration instructions when using an operator panel with display and/or a decoupling module with SIMOCODE pro V with PROFIBUS

If you want to use an operator panel with display and/or a decoupling module in the SIMOCODE pro V system with PROFIBUS, then the following configuration instructions concerning the type and number of connectable expansion modules must be observed.

The following tables show the maximum possible configuration of the expansion modules for the various combinations.

The DM-F Local and DM-F PROFIsafe fail-safe expansion modules behave in this connection like digital modules for standard applications.

Use of an operator panel with display

Digital module 1	Digital module 2	Analog module	Temperature module	Ground-fault module
Only operator panel with display for SIMOCODE pro V (24 V DC or 110 ... 240 V AC/DC)				
Max. 4 expansion modules can be used				
Operator panel with display and current/voltage measurement with SIMOCODE pro V (110 ... 240 V AC/DC)				
Max. 3 expansion modules can be used or:				
--	--	✓	✓	--

✓ Available

-- Not available

Use of a decoupling module (voltage measurement in insulated networks)

Digital module 1	Digital module 2	Analog module	Temperature module	Ground-fault module
SIMOCODE pro V (24 V DC)				
✓ ¹⁾	✓ ¹⁾	✓	✓	✓
SIMOCODE pro V (110 ... 240 V AC/DC)				
✓	✓	--	✓	✓
✓ ¹⁾	✓ ¹⁾	✓	✓	--
✓	--	✓	✓	--
✓	--	✓	--	✓

✓ Available

-- Not available

¹⁾ No bistable relay outputs and no more than 5 of 7 relay outputs active simultaneously (> 3 s).

Use of a decoupling module (voltage measurement in insulated networks) in combination with an operator panel with display

Digital module 1	Digital module 2	Analog module	Temperature module	Ground-fault module
SIMOCODE pro V (24 V DC)				
✓	--	✓	✓	✓
✓	✓	--	✓	✓
SIMOCODE pro V (110 ... 240 V AC/DC)				
✓ ¹⁾	--	✓	✓	✓
✓	✓	--	--	--
✓ ²⁾	✓ ²⁾	✓ ³⁾	--	--
✓	--	--	✓	✓

✓ Available

-- Not available

¹⁾ No bistable relay outputs and no more than 3 of 5 relay outputs active simultaneously (> 3 s).

²⁾ No bistable relay outputs and no more than 5 of 7 relay outputs active simultaneously (> 3 s).

³⁾ Analog module output is not used.

Protective separation

All circuits in SIMOCODE pro are safely isolated from each other in accordance with IEC 60947-1. That is, they are designed with double creepages and clearances. In the event of a fault, therefore, no parasitic voltages can be formed in neighboring circuits. The instructions of Test log No. 2668 must be complied with.

Types of protection EEx e and EEx d

The overload protection and the thermistor motor protection of the SIMOCODE pro system comply with the requirements for overload protection of explosion-proof motors to the type of protection:

- EEx d "flameproof enclosure" e.g. according to IEC 60079-1
- EEx e "increased safety" e.g. according to IEC 60079-7

When using SIMOCODE pro devices with a 24 V DC control voltage, electrical separation must be ensured using a battery or a safety transformer according to IEC 61558-2-6.

EC type test certificate: BVS 06 ATEX F 001

Test log: BVS PP 05.2029 EG.

Selection data for type-tested assemblies/load feeders

For configuration tables according to type of coordination "1" or "2", see

- Manual "Configuring SIRIUS",
Article No.: 3ZX1012-0RA21-0AC0,
<http://support.automation.siemens.com/WW/view/en/40625241>
- Manual "Configuring SIRIUS Innovations",
Article No.: 3ZX1012-0RA21-1AC0,
<http://support.automation.siemens.com/WW/view/en/39714188>
- SIMOCODE pro PROFIBUS System Manual,
Article No.: 3UF7970-0AA00-0,
<http://support.automation.siemens.com/WW/view/en/20017780>
- SIMOCODE pro PROFINET System Manual,
Article No.: 3ZX1012-0UF70-1AC1,
<http://support.automation.siemens.com/WW/view/en/61896631>

System manual







The SIMOCODE pro system manual describes the motor management system and its functions in detail. It provides information on configuration, start up, servicing and maintenance. A typical example of a reversing starter application is used to teach the user quickly and practically how to use the system. In addition to help on how to identify and rectify faults in the event of a malfunction, the manual also contains special information for servicing and maintenance. For selection of equipment and for configuration, it is recommended to consult the system manual.

A detailed description of the DM-F Local and DM-F PROFIsafe fail-safe expansion modules is provided in the system manual "SIMOCODE pro Safety Fail-Safe Digital Modules", which can be downloaded from the Internet.

Internet

More information, see www.siemens.com/simocode.

Selection and ordering data



Version	Current setting	Width	DT	Screw terminals	Price per PU	PU (UNIT, SET, M)	PS*	Weight per PU approx.
	A	mm		Order No.				
SIMOCODE pro								
	SIMOCODE pro C, basic unit 1							
	PROFIBUS DP interface, 12 Mbit/s, RS 485 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs, rated control supply voltage U_s :							
	• 24 V DC		▶	3UF7 000-1AB00-0		1	1 unit	0.350
	• 110 ... 240 V AC/DC		▶	3UF7 000-1AU00-0		1	1 unit	0.350
	SIMOCODE pro V, basic unit 2							
	PROFIBUS DP interface, 12 Mbit/s, RS 485 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by expansion modules, rated control supply voltage U_s :							
	• 24 V DC		▶	3UF7 010-1AB00-0		1	1 unit	0.350
	• 110 ... 240 V AC/DC		▶	3UF7 010-1AU00-0		1	1 unit	0.350
	SIMOCODE pro V PROFINET, basic unit 3¹⁾							
	ETHERNET/PROFINET IO, OPC UA- server and web server, 100 Mbit/s, 2 x connection to bus through RJ45, 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by expansion modules, rated control supply voltage U_s :							
	• 24 V DC		▶	3UF7 011-1AB00-0		1	1 unit	0.350
	• 110 ... 240 V AC/DC		▶	3UF7 011-1AU00-0		1	1 unit	0.350
	Current measuring modules							
	• Straight-through transformers	0.3 ... 3	45	▶	3UF7 100-1AA00-0	1	1 unit	0.100
		2.4 ... 25	45	▶	3UF7 101-1AA00-0	1	1 unit	0.150
		10 ... 100	55	▶	3UF7 102-1AA00-0	1	1 unit	0.350
		20 ... 200	120	▶	3UF7 103-1AA00-0	1	1 unit	0.600
	• Busbar connections	20 ... 200	120		3UF7 103-1BA00-0	1	1 unit	1.000
		63 ... 630	145	▶	3UF7 104-1BA00-0	1	1 unit	1.750
	Current/voltage measuring modules For SIMOCODE pro V							
	Voltage measuring up to 690 ²⁾ if required in connection with a decoupling module							
	• Straight-through transformers	0.3 ... 3	45	▶	3UF7 110-1AA00-0	1	1 unit	0.150
		2.4 ... 25	45	▶	3UF7 111-1AA00-0	1	1 unit	0.200
		10 ... 100	55	▶	3UF7 112-1AA00-0	1	1 unit	0.400
		20 ... 200	120	▶	3UF7 113-1AA00-0	1	1 unit	0.700
	• Busbar connections	20 ... 200	120		3UF7 113-1BA00-0	1	1 unit	1.000
		63 ... 630	145	▶	3UF7 114-1BA00-0	1	1 unit	1.750
	Decoupling modules							
	For connecting upstream from a current/voltage measuring module on the system interface when using voltage detection in insulated, high-resistance or asymmetrically grounded systems and in single-phase systems			A	3UF7 150-1AA00-0	1	1 unit	0.150

¹⁾ When using an operator panel with display, the product version must be E07 or higher (from 08/2012).

²⁾ Voltage measurement on ungrounded or high resistance grounded systems (HRG) require a decoupling module (3UF7 150-1AA00-0).

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 motor management and control devices

Version		DT	Screw terminals		PU (UNIT, SET, M)	PS*	Weight per PU approx.
			Order No.		Price per PU		
SIMOCODE pro (continued)							
 <p>3UF7 200-1AA00-0</p>	Operator panels Installation in control cabinet door or front plate, for plugging into basic unit, 10 LEDs for status indication and user-assignable buttons for controlling the motor		▶	3UF7 200-1AA00-0	1	1 unit	0.100
 <p>3UF7 210-1AA00-0</p>	Operator panel with display for SIMOCODE pro V Installation in control cabinet door or front plate, for plugging into basic unit 2 and basic unit 3, 7 LEDs for status indication and user-assignable buttons for controlling the motor, multilingual display, e.g. for indication of measured values, status information or fault messages		▶	3UF7 210-1AA00-0	1	1 unit	0.150

Selection and ordering data

Version	DT	Screw terminals	⊕	PU (UNIT, SET, M)	PS*	Weight per PU approx.
		Order No.	Price per PU			

Expansion modules for SIMOCODE pro V

With SIMOCODE pro V, it is possible to expand the type and number of inputs and outputs in steps. Each expansion module has two system interfaces on the front. Through the one system interface the expansion module is connected to the system interface of the SIMOCODE pro V using a connection cable; through the second system interface, further expansion modules or the operator panel can be connected.

The power supply for the expansion modules is provided by the connection cable through basic unit 2 or basic unit 3.

Note:

Please order connection cable separately, [see page 3/73](#).

Digital modules

Up to two digital modules can be used to add additional binary inputs and relay outputs to the basic unit. The input circuits of the digital modules are supplied from an external power supply.

4 binary inputs and 2 relay outputs,
Up to 2 digital modules can be connected

Relay outputs	Input voltage				
Monostable	24 V DC	▶	3UF7 300-1AB00-0	1	1 unit 0.150
	110 ... 240 V AC/DC	▶	3UF7 300-1AU00-0	1	1 unit 0.150
Bistable	24 V DC	▶	3UF7 310-1AB00-0	1	1 unit 0.150
	110 ... 240 V AC/DC	▶	3UF7 310-1AU00-0	1	1 unit 0.150



3UF7 300-1AU00-0

Analog modules

Basic unit can be optionally expanded with analog inputs and outputs (0/4 ... 20 mA) by means of the analog module. ▶

2 inputs (passive) for input and 1 output for output of 0/4 ... 20 mA signals, max. 1 analog module can be connected per basic unit 2 and max. 2 analog modules per basic unit 3

3UF7 400-1AA00-0 1 1 unit 0.150



3UF7 400-1AA00-0

Ground-fault modules

Instead of ground-fault monitoring using the current measuring modules or current/voltage measuring modules, it may be necessary, especially in high-impedance grounded networks, to implement ground-fault monitoring for smaller ground fault currents using a summation current transformer. ▶

1 input for connecting a 3UL22 summation current transformer, up to 1 ground-fault module can be connected

3UF7 500-1AA00-0 1 1 unit 0.150



3UF7 500-1AA00-0

Temperature modules

Independently of the thermistor motor protection of the basic units, up to 3 analog temperature sensors can be evaluated using a temperature module.

Sensor types: PT100/PT1000, KTY83/KTY84 or NTC

3 inputs for connecting up to 3 analog temperature sensors, up to 1 temperature module can be connected per basic unit 2 and max. 2 temperature modules per basic unit 3



3UF7 700-1AA00-0 1 1 unit 0.150



3UF7 700-1AA00-0








SIMOCODE pro 3UF7 motor management and control devices

Selection and ordering data

Version	DT	Screw terminals	PU (UNIT, SET, M)	PS*	Weight per PU approx.
Order No.		Price per PU			
Fail-safe expansion modules for SIMOCODE pro V					
<p>Thanks to the fail-safe expansion modules, SIMOCODE pro V can be expanded with the function of a safety relay for the fail-safe disconnection of motors. A maximum of 1 fail-safe digital module can be connected; it can be used instead of a digital module.</p> <p>The fail-safe expansion modules are equipped likewise with two system interfaces at the front for making the connection to other system components. Unlike other expansion modules, power is supplied to the modules through a separate terminal connection.</p> <p><u>Note:</u></p> <p>Please order connection cable separately, see page 3/73.</p>					
DM-F Local fail-safe digital modules¹⁾					
<p>For fail-safe disconnection using a hardware signal</p> <p>2 relay enabling circuits, joint switching; 2 relay outputs, common potential disconnected fail-safe; inputs for sensor circuit, start signal, cascading and feedback circuit, safety function adjustable using DIP switches Rated control supply voltage U_s:</p> <ul style="list-style-type: none"> • 24 V DC • 110 ... 240 V AC/DC 					
 <p>3UF7 320-1AB00-0</p>					
DM-F PROFIsafe fail-safe digital modules¹⁾					
<p>For fail-safe disconnection using PROFIBUS/PROFIsafe or PROFINET/PROFIsafe</p> <p>2 relay enabling circuits, joint switching; 2 relay outputs, common potential disconnected fail-safe; 1 input for feedback circuit; 3 binary standard inputs Rated control supply voltage U_s:</p> <ul style="list-style-type: none"> • 24 V DC • 110 ... 240 V AC/DC 					
 <p>3UF7 330-1AB00-0</p>					
<p>3UF7 320-1AB00-0</p> <p>1 1 unit 0.150</p> <p>3UF7 320-1AU00-0</p> <p>1 1 unit 0.150</p>					
<p>3UF7 330-1AB00-0</p> <p>1 1 unit 0.150</p> <p>3UF7 330-1AU00-0</p> <p>1 1 unit 0.150</p>					






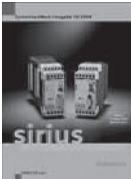
¹⁾ Only possible with basic unit 2, product version E07 and higher (from 05/2011) or basic unit 3

Accessories

Version	DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	Weight per PU approx. kg
Connection cables (essential accessory)						
 <p>3UF7 932-0AA00-0</p>	Connection cables In different lengths for connecting basic unit, current measuring module, current/voltage measuring module, operator panel or expansion modules or decoupling module:					
	▶	3UF7 930-0AA00-0		1	1 unit	0.010
	▶	3UF7 931-0AA00-0		1	1 unit	0.010
	▶	3UF7 935-0AA00-0		1	1 unit	0.020
	▶	3UF7 932-0AA00-0		1	1 unit	0.020
	▶	3UF7 932-0BA00-0		1	1 unit	0.050
	▶	3UF7 937-0BA00-0		1	1 unit	0.100
	▶	3UF7 933-0BA00-0		1	1 unit	0.150
PC cables and adapters						
 <p>3UF7 940-0AA00-0</p>	For PC/PG communication with SIMOCODE pro through the system interface, for connecting to the serial interface of the PC/PG					
	▶	3UF7 940-0AA00-0		1	1 unit	0.150
	USB PC cables For connecting to the USB interface of a PC/PG, for communication with SIMOCODE pro through the system interface					
	▶	3UF7 941-0AA00-0		1	1 unit	0.150
	USB/serial adapters To connect an RS 232 PC cable to the USB port of a PC					
		3UF7 946-0AA00-0		1	1 unit	0.150
Memory modules						
 <p>3UF7 900-0AA00-0</p>	Memory modules for SIMOCODE pro C and SIMOCODE pro V For saving the complete parameter assignment of a SIMOCODE pro C or SIMOCODE pro V system					
	▶	3UF7 900-0AA00-0		1	1 unit	0.010
	Memory modules for SIMOCODE pro V PROFINET For saving the complete parameter assignment of a SIMOCODE pro V PROFINET system					
	▶	3UF7 901-0AA00-0		1	1 unit	0.010
Interface covers						
 <p>3UF7 950-0AA00-0</p>	For system interface					
	▶	3UF7 950-0AA00-0		1	5 units	0.100
Addressing plugs						
 <p>3UF7 910-0AA00-0</p>	For assigning the PROFIBUS addresses without using a PC/PG On SIMOCODE pro through the system interface					
	▶	3UF7 910-0AA00-0		1	1 unit	0.030
Door adapters						
 <p>3UF7 920-0AA00-0</p>	For external connection of the system interface Outside, for example, a control cabinet					
		3UF7 920-0AA00-0		1	1 unit	0.030
Adapters for operator panel						
 <p>3UF7 922-0AA00-0</p>	The adapter enables the smaller 3UF7 20 operator panel from SIMOCODE pro to be used in a front panel cutout in which previously, e. g. after a change of system, a larger 3UF5 2 operator panel from SIMOCODE-DP had been used; degree of protection IP54					
		3UF7 922-0AA00-0		1	1 unit	0.150

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 motor management and control devices

Version	DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	Weight per PU approx. kg
Labeling strips						
 <p>3UF7 925-0AA02-0</p>		• For pushbuttons of the 3UF7 20 operator panel	3UF7 925-0AA00-0	100	400 units	15.000
		• For pushbuttons of the 3UF7 21 operator panel with display	3UF7 925-0AA01-0	100	600 units	15.000
		• For LEDs of the 3UF7 20 operator panel	3UF7 925-0AA02-0	100	1200 units	15.000
<p><i>Note: Pre-punched labeling strips for user-specific printing using the free inscription software "SIRIUS Label Designer" on a laser printer. Note the software version! Download from http://www.siemens.com/simocode.</i></p>						
Push-in lugs						
 <p>3RB19 00-0B</p>		For screw fixing e. g. on mounting plate, 2 units required per device				
		• Can be used with 3UF7 1.0, 3UF7 1.1 and 3UF7 1.2	▶ 3RB19 00-0B	100	10 units	0.100
		• Can be used with 3UF7 0, 3UF7 3, 3UF7 4, 3UF7 5 and 3UF7 7	▶ 3RP19 03	1	10 units	0.002
Terminal covers						
 <p>3RT19 56-4EA1</p>		Covers for cable lugs and busbar connections				
		• Length 100 mm, can be used for 3UF7 1.3-1BA00-0	▶ 3RT19 56-4EA1	1	1 unit	0.070
		• Length 120 mm, can be used for 3UF7 1.4-1BA00-0	▶ 3RT19 66-4EA1	1	1 unit	0.130
 <p>3RT19 56-4EA2</p>		Covers for box terminals				
		• Length 25 mm, can be used for 3UF7 1.3-1BA00-0	▶ 3RT19 56-4EA2	1	1 unit	0.030
		• Length 30 mm, can be used for 3UF7 1.4-1BA00-0	▶ 3RT19 66-4EA2	1	1 unit	0.040
		Covers for screw terminals between contactor and current measuring module or current/voltage measuring module for direct mounting				
		• Can be used for 3UF7 1.3-1BA00-0	▶ 3RT19 56-4EA3	1	1 unit	0.020
		• Can be used for 3UF7 1.4-1BA00-0	▶ 3RT19 66-4EA3	1	1 unit	0.060
Box terminal blocks						
 <p>3RT19 5.-4G</p>		For round and ribbon cables				
		• Up to 70 mm ² , can be used for 3UF7 1.3-1BA00-0	▶ 3RT19 55-4G	1	1 unit	0.230
		• Up to 120 mm ² , can be used for 3UF7 1.3-1BA00-0	▶ 3RT19 56-4G	1	1 unit	0.260
		• Up to 240 mm ² , can be used for 3UF7 1.4-1BA00-0	▶ 3RT19 66-4G	1	1 unit	0.676
Bus terminations						
		Bus termination module with separate supply voltage for terminating the bus following the last unit on the bus line. Supply voltage:				
		• 115/230 V AC	3UF1 900-1KA00	1	1 unit	0.286
		• 24 V DC	3UF1 900-1KB00	1	1 unit	0.192
System manuals						
 <p>3UF7 970-0AA01-0</p>		SIMOCODE pro				
		languages: • English	3UF7 970-0AA00-0	1	1 unit	0.850

SIMOCODE pro 3UF7 motor management and control devices

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3

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	Weight per PU approx. kg.
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SIMOCODE ES 2007 Basic



Floating license for one user

Engineering software, type of delivery: on CD incl. electronic documentation, 3 languages (German/English/French), communication through system interface

- License key on USB stick, Class A
- License key download, Class A

▶	3ZS1 312-4CC10-0YA5	1	1 unit	0.230
▶	3ZS1 312-4CE10-0YB5	1	1 unit	0.230

3ZS1 312-4CC10-0YA5

SIMOCODE ES 2007 Standard

Floating license for one user

Engineering software, type of delivery: on CD incl. electronic documentation, 3 languages (German/English/French), communication through system interface, integrated graphics editor

- License key on USB stick, Class A
- License key download, Class A

▶	3ZS1 312-5CC10-0YA5	1	1 unit	0.230
▶	3ZS1 312-5CE10-0YB5	1	1 unit	0.230

Upgrade for SIMOCODE ES 2004 and later

Floating license for one user, engineering software, type of delivery: on CD incl. electronic documentation, 3 languages (German/English/French), license key on USB stick, Class A, communication through system interface, integrated graphics editor

A	3ZS1 312-5CC10-0YE5	1	1 unit	0.230
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Powerpack for SIMOCODE ES 2007 Basic

Floating license for one user, engineering software, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface, integrated graphics editor

▶	3ZS1 312-5CC10-0YD5	1	1 unit	0.230
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Software Update Service

For 1 year with automatic extension, assuming the current software version is in use, engineering software, type of delivery: on CD incl. electronic documentation, communication through system interface, integrated graphics editor

▶	3ZS1 312-5CC10-0YL5	1	1 unit	0.230
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SIMOCODE ES 2007 Premium

Floating license for one user

Engineering software, type of delivery: on CD incl. electronic documentation, 3 languages (German/English/French), communication through PROFIBUS/PROFINET or system interface, integrated graphics editor, STEP7 Object Manager

- License key on USB stick, Class A
- License key download, Class A

▶	3ZS1 312-6CC10-0YA5	1	1 unit	0.230
▶	3ZS1 312-6CE10-0YB5	1	1 unit	0.230

Upgrade for SIMOCODE ES 2004 and later

Floating license for one user, engineering software, type of delivery: on CD incl. electronic documentation, 3 languages (German/English/French), license key on USB stick, Class A, communication through PROFIBUS/PROFINET or system interface, integrated graphics editor, STEP7 Object Manager

A	3ZS1 312-6CC10-0YE5	1	1 unit	0.230
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Powerpack for SIMOCODE ES 2007 Standard

Floating license for one user, engineering software, license key on USB stick, Class A, 3 languages (German/English/French), communication through PROFIBUS/PROFINET or the system interface, integrated graphics editor, STEP7 Object Manager

A	3ZS1 312-6CC10-0YD5	1	1 unit	0.230
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Software Update Service

For 1 year with automatic extension, assuming the current software version is in use, engineering software, type of delivery: on CD incl. electronic documentation, communication through PROFIBUS/PROFINET or system interface, integrated graphics editor, STEP7 Object Manager


▶	3ZS1 312-6CC10-0YL5	1	1 unit	0.230
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Notes:

Please order PC cable separately, [see page 3/73](#).

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 motor management and control devices

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	Weight per PU approx. kg.
SIMOCODE pro Function Block Library for SIMATIC PCS 7						
 3UF7 982-0AA00-0		Engineering software V7		1	1 unit	0.240
		For one engineering station (single license) including runtime software for execution of the AS modules in an automation system (single license), German/English/French				
		Scope of supply: AS modules and faceplates for integrating SIMOCODE pro into the PCS 7 process control system, for PCS 7 version V 7.0/V 7.1				
		Type of delivery: Software and documentation on CD, one license for one engineering station, one license for one automation system				
		Runtime license V7		1	1 unit	0.001
		For execution of the AS modules in an automation system (single license)				
		Required for using the AS modules of the engineering software V7 or the engineering software migration V7-V8 on an additional automation system within a plant				
		Type of delivery: one license for one automation system, without software and documentation				
		Upgrade for PCS 7 function block library SIMOCODE pro, V 6.0 or V 6.1 to version SIMOCODE pro V 7.0/V 7.1		1	1 unit	0.240
		For one engineering station (single license) including runtime software for execution of the AS modules in an automation system (single license), German/English/French				
		Scope of supply: AS modules and faceplates for integrating SIMOCODE pro into the PCS 7 process control system, for PCS 7 version V 7.0 or V 7.1				
		Type of delivery: Software and documentation on CD, one license for one engineering station, one license for one automation system				
		Engineering software migration V7-V8		1	1 unit	0.212
		For upgrading (migrating) an existing engineering software V7 of the SIMOCODE pro Function Block Library for PCS 7				
		Conditions of use: Availability of the engineering software V7 (license) of the SIMOCODE pro Function Block Library for PCS 7 for the PCS 7 version V 7.0 or V 7.1				
		The engineering software migration V7-V8 can be installed directly onto a system with PCS 7 version V 8.0; installation of the previous version is unnecessary.				
		For one engineering station (single license) including runtime software for execution of the AS modules in an automation system (single license), German/English/French				
		Scope of delivery: AS modules and faceplates for integrating SIMOCODE pro into the PCS 7 process control system, for PCS 7 version V 8.0				
		Type of delivery: software and documentation on CD, license for upgrading an existing license for one engineering station and a plant's assigned runtime licenses				

Note:

Programming and Operating Manual SIMOCODE pro Library for PCS 7 [see](http://support.automation.siemens.com/WW/view/en/49963525) <http://support.automation.siemens.com/WW/view/en/49963525>.

• Revised •
10/18/15

SIMOCODE pro 3UF7 motor management and control devices

1

2

3

Current measuring modules or current/voltage measuring modules

Type		3UF7 1.0	3UF7 1.1	3UF7 1.2	3UF7 1.3	3UF7 1.4
Main circuit						
Current setting I_e	A	0.3 ... 3	2.4 ... 25	10 ... 100	20 ... 200	63 ... 630
Rated insulation voltage U_i	V	690; 3UF7 103 and 3UF7 104: 1 000 (at pollution degree 3)				
Rated operational voltage U_e	V	690				
Rated impulse withstand voltage U_{imp}	kV	6; 3UF7 103 and 3UF7 104: 8				
Rated frequency	Hz	50/60				
Type of current		Three-phase current				
Short-circuit		Additional short-circuit protection is required in the main circuit				
Accuracy of current measurement (in the range of 1 x minimum current setting I_u to 8 x maximum current setting I_o)	%	±3				
Typical voltage measuring range						
• Phase-to-phase voltage/line-to-line voltage (e.g. $U_{L1 L2}$)	V	110 ... 690				
• Phase voltage (e.g. $U_{L1 N}$)	V	65 ... 400				
Accuracy						
• Voltage measurement (phase voltage U_L in the range 230 ... 400 V)	%	±3 (typical)				
• Power factor measurement (in the rated load range power factor = 0.4 ... 0.8)	%	±5 (typical)				
• Apparent power measurement (in the rated load range)	%	±5 (typical)				
Notes on voltage measurement						
• In insulated, high-resistance or asymmetrically grounded forms of power supply system and for single-phase systems		In these networks the current/voltage measuring module can be used only with an upstream decoupling module on the system interface. In the supply lines from the main circuit for voltage measurement of SIMOCODE pro it may be necessary to provide additional line protection!				
• Supply lines for voltage measurement						

Digital modules

Type		3UF7300, 3UF7310, 3UF7600			
Control circuits					
Rated insulation voltage U_i	V	300 (at pollution degree 3)			
Rated impulse withstand voltage U_{imp}	kV	4			
Relay outputs					
• Number		2 monostable or bistable relay outputs (depending on the version)			
• Specified short-circuit protection for auxiliary contacts (relay outputs)					
- Fuse links		6 A gG operational class; 10 A quick-response (IEC 60947-5-1)			
- Miniature circuit breakers		1.6 A, C characteristic (IEC 60947-5-1); 6 A, C characteristic (Ik < 500 A)			
• Rated uninterrupted current	A	6			
• Rated switching capacity					
- AC-15		6 A/24 V AC	6 A/120 V AC	3 A/230 V AC	
- DC-13		2 A/24 V DC	0.55 A/60 V DC	0.25 A/125 V DC	
Inputs (binary)		4 inputs, electrically isolated, supplied externally with 24 V DC or 110 ... 240 V AC/DC depending on the version, connected to a common potential			

Ground-fault modules or multifunction modules

Type	3UF7510, 3UF7600
<i>Control circuit</i>	
Connectable residual-current transformers	3UL23
Type of current for monitoring	Type A (AC and pulsating DC residual currents)
Adjustable response value	30 mA ... 40 A
Relative measurement error	7.5 %

Temperature modules

Type	3UF7600, 3UF7700				
Sensor circuit					
Typical sensor circuit					
• PT100	mA	1 (typical)			
• PT1000/KTY83/KTY84/NTC	mA	0.2 (typical)			
Open-circuit/short-circuit detection					
• Sensor type		PT100/PT1000	KTY83-110	KTY84	NTC
- Open circuit		✓	✓	✓	--
- Short-circuit		✓	✓	✓	✓
- Measuring range	°C	-50 ... +500	-50 ... +175	-40 ... +300	80 ... 160
Measuring accuracy at 20 °C ambient temperature (T20)	K	<± 2			
Deviation due to ambient temperature (in % of measuring range)	%	0.05 per K deviation from T20			
Conversion time	ms	500			
Connection type		Two- or three-wire connection			

✓ Detection possible

-- Detection not possible

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 motor management and control devices

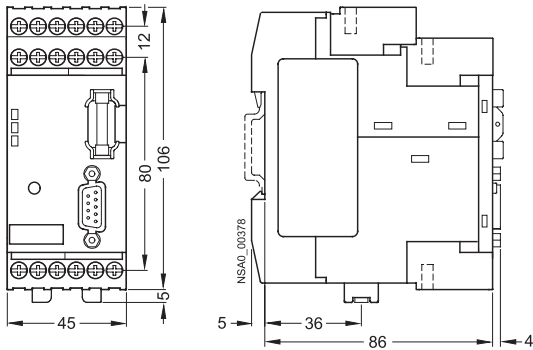
Current measuring modules or current/voltage measuring modules						
Type		3UF7 1.0	3UF7 1.1	3UF7 1.2	3UF7 1.3	3UF7 1.4
Main circuit						
Current setting I_e	A	0.3 ... 3	2.4 ... 25	10 ... 100	20 ... 200	63 ... 630
Rated insulation voltage U_i	V	690; 3UF7 103 and 3UF7 104: 1 000 (at pollution degree 3)				
Rated operational voltage U_o	V	690				
Rated impulse withstand voltage U_{imp}	kV	6; 3UF7 103 and 3UF7 104: 8				
Rated frequency	Hz	50/60				
Type of current		Three-phase current				
Short-circuit		Additional short-circuit protection is required in the main circuit				
Accuracy of current measurement (in the range of 1 x minimum current setting I_u to 8 x maximum current setting I_o)	%	±3				
Typical voltage measuring range						
• Phase-to-phase voltage/line-to-line voltage (e.g. U_{L1L2})	V	110 ... 690				
• Phase voltage (e.g. U_{L1N})	V	65 ... 400				
Accuracy						
• Voltage measurement (phase voltage U_L in the range 230 ... 400 V)	%	±3 (typical)				
• Power factor measurement (in the rated load range power factor = 0.4 ... 0.8)	%	±5 (typical)				
• Apparent power measurement (in the rated load range)	%	±5 (typical)				
Notes on voltage measurement						
• In insulated, high-resistance or asymmetrically grounded forms of power supply system and for single-phase systems		In these networks the current/voltage measuring module can be used only with an upstream decoupling module on the system interface. In the supply lines from the main circuit for voltage measurement of SIMOCODE pro it may be necessary to provide additional line protection!				
• Supply lines for voltage measurement						
Digital modules						
Type		3UF7 3				
Control circuits						
Rated insulation voltage U_i	V	300 (at pollution degree 3)				
Rated impulse withstand voltage U_{imp}	kV	4				
Relay outputs						
• Number		2 monostable or bistable relay outputs (depending on the version)				
• Specified short-circuit protection for auxiliary contacts (relay outputs)						
- Fuse links						
- Miniature circuit breakers						
• Rated uninterrupted current	A	6 A gG operational class; 10 A quick-response (IEC 60947-5-1)				
• Rated switching capacity		1.6 A, C characteristic (IEC 60947-5-1); 6 A, C characteristic (Ik < 500 A)				
- AC-15		6 A/24 V AC		6 A/120 V AC		3 A/230 V AC
- DC-13		2 A/24 V DC		0.55 A/60 V DC		0.25 A/125 V DC
Inputs (binary)		4 inputs, electrically isolated, supplied externally with 24 V DC or 110 ... 240 V AC/DC depending on the version, connected to a common potential				
Ground-fault modules						
Type		3UF7 5				
Control circuits						
Connectable 3UL22 summation current transformer with rated fault currents I_N	A	0.3/0.5/1				
• $I_{Ground\ fault} \leq 50\% I_N$		No tripping				
• $I_{Ground\ fault} \geq 100\% I_N$		Tripping				
Response delay (conversion time)	ms	300 ... 500, additionally delayable				
Temperature modules						
Type		3UF7 7				
Sensor circuit						
Typical sensor circuit						
• PT100	mA	1 (typical)				
• PT1000/KTY83/KTY84/NTC	mA	0.2 (typical)				
Open-circuit/short-circuit detection						
• Sensor type		PT100/PT1000	KTY83-110	KTY84	NTC	
- Open circuit		✓	✓	✓	—	
- Short-circuit		✓	✓	✓	✓	
- Measuring range	°C	-50 ... +500	-50 ... +175	-40 ... +300	80 ... 160	
Measuring accuracy at 20 °C ambient temperature (T20)	K	<± 2				
Deviation due to ambient temperature (in % of measuring range)	%	0.05 per K deviation from T20				
Conversion time	ms	500				
Connection type		Two- or three-wire connection				

✓ Detection possible

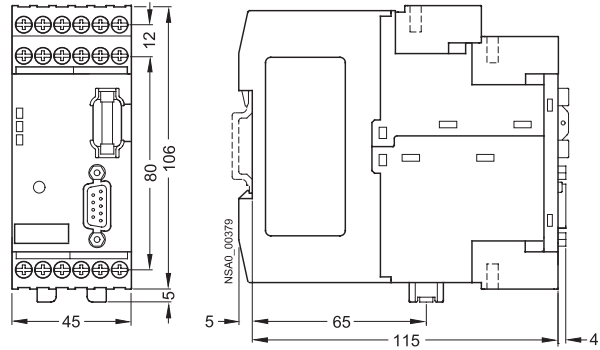
— Detection not possible

Dimensional drawings

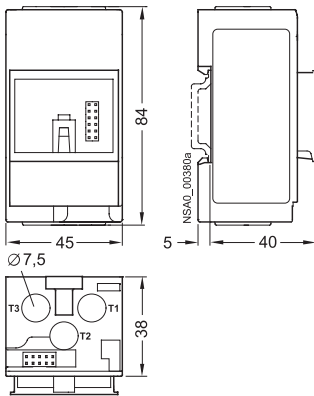
Basic unit 1, SIMOCODE pro C, 3UF7 000



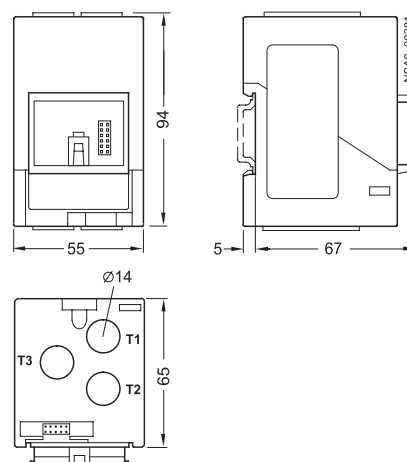
Basic unit 2, SIMOCODE pro V, 3UF7 010



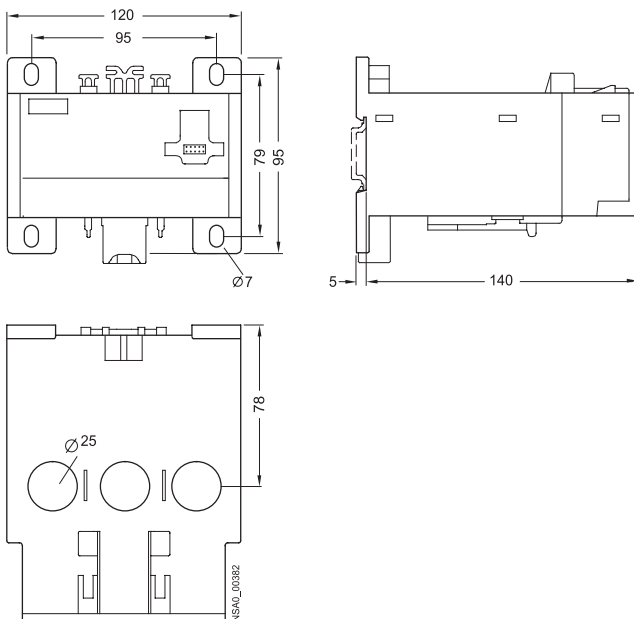
3UF7 100, 3UF7 101 current measuring module
(straight-through transformer)



3UF7 102 current measuring module
(straight-through transformer)



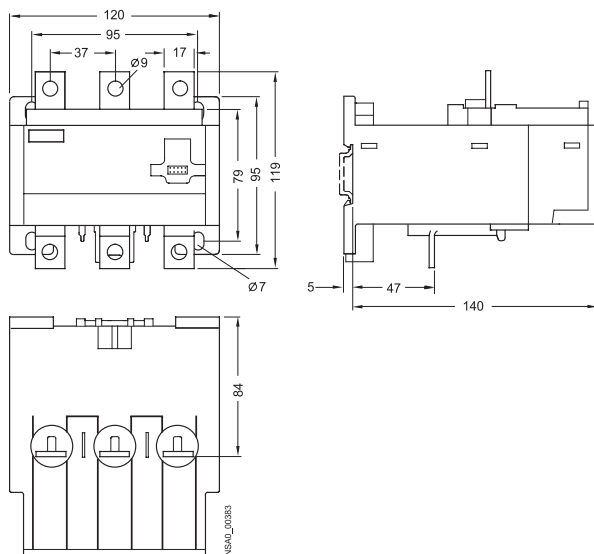
3UF7 103 current measuring module (straight-through transformer)



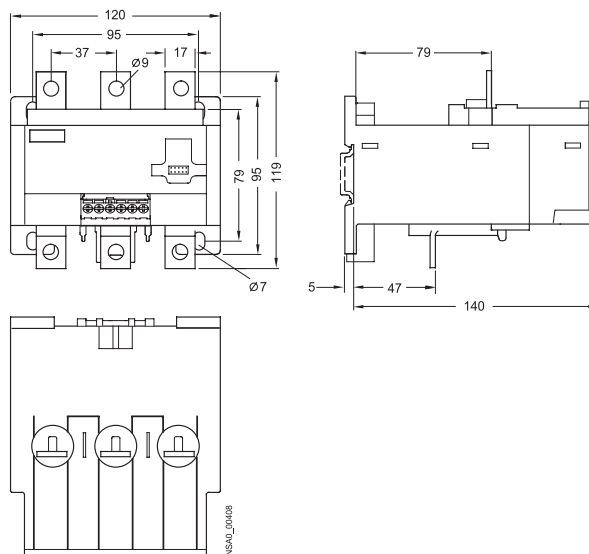
SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 motor management and control devices

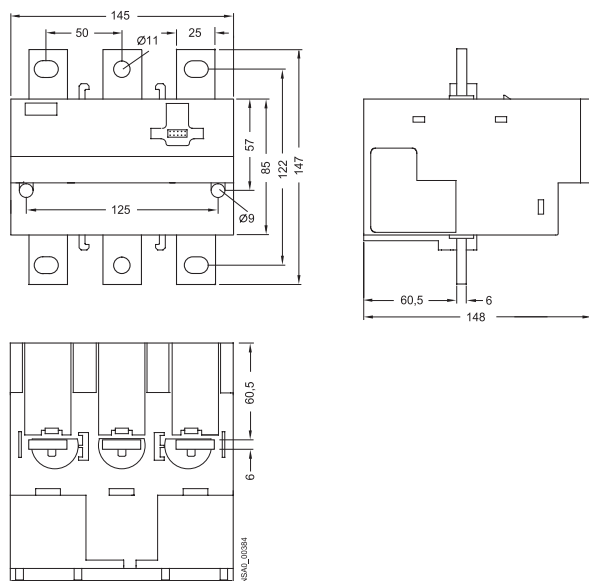
3UF7 103 current measuring module (busbar connection)



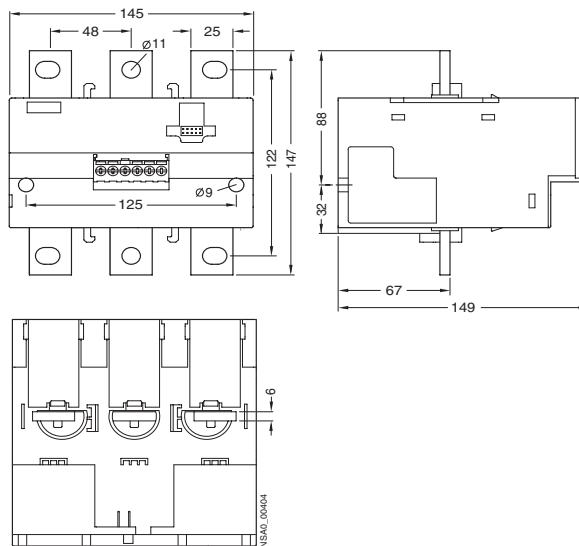
3UF7 113 current/voltage measuring module (busbar connection)



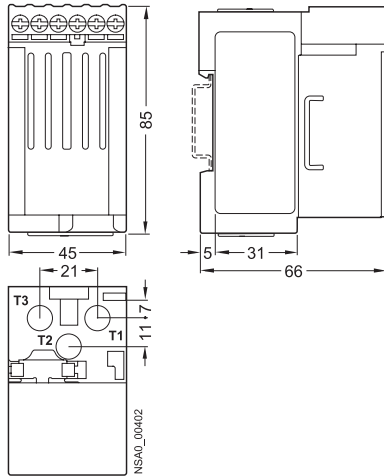
3UF7 104 current measuring module (busbar connection)



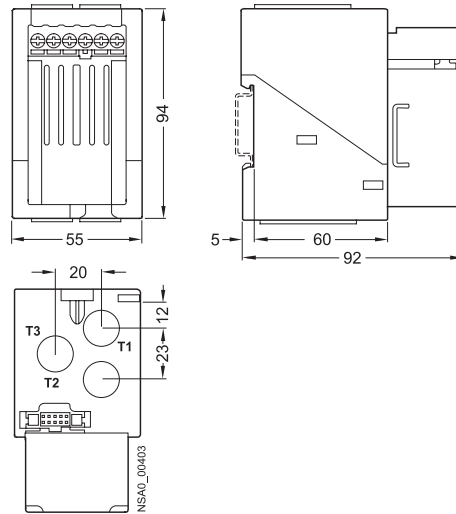
3UF7 114 current/voltage measuring module (busbar connection)



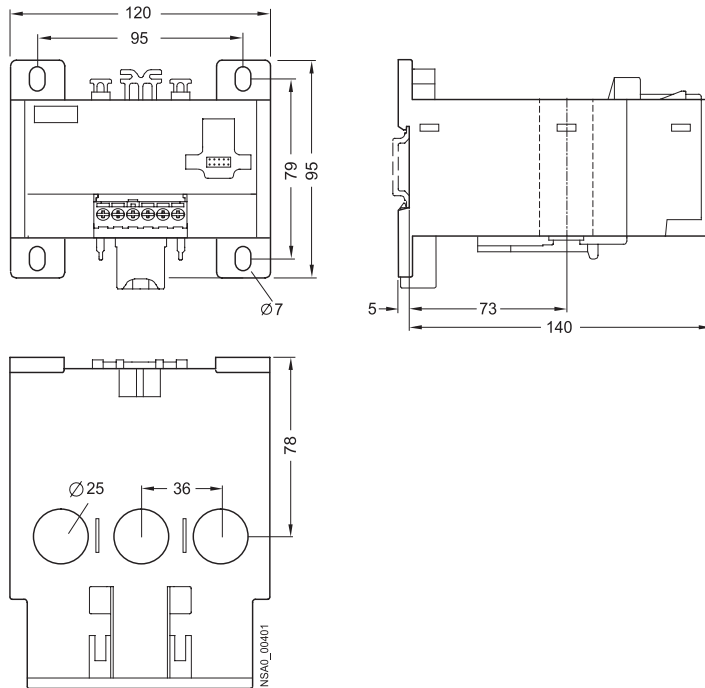
**3UF7 110, 3UF7 111 current/voltage measuring module
(straight-through transformer)**



**3UF7 112 current/voltage measuring module
(straight-through transformer)**



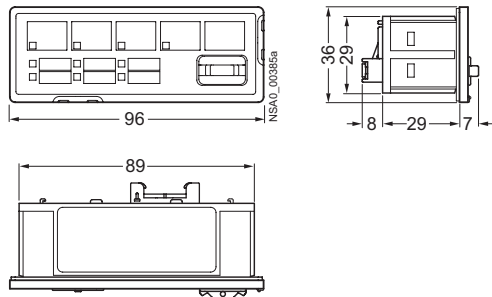
3UF7 113 current/voltage measuring module (straight-through transformer)



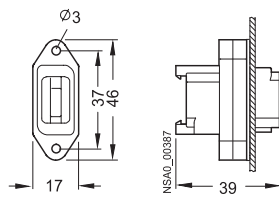
SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 motor management and control devices

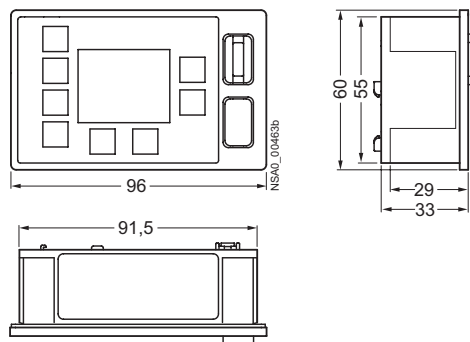
3UF7 200 operator panel



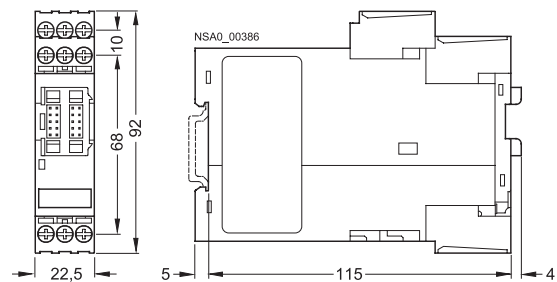
3UF7 920 door adapter



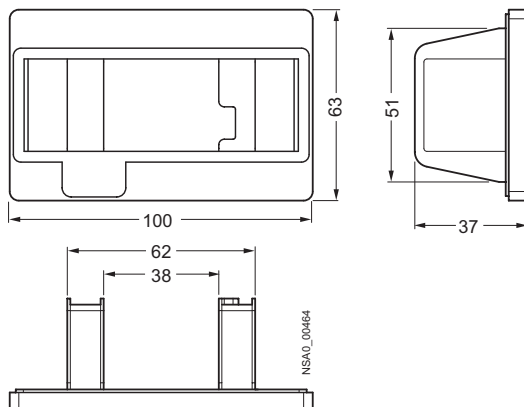
3UF7 210 operator panel with display



**3UF7 3 digital module
3UF7 4 analog module
3UF7 5 ground-fault module
3UF7 7 temperature module
3UF7 15 decoupling module**



3UF7 922 adapter for operator panel



Contents

Self Protected Motor Starters per UL 508 Type E 3RA6



3RA61 / 3RA62 up to 32 A
for mounting rail, surface,
comb busbar, infeed system

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- Accessories 4/9-4/13

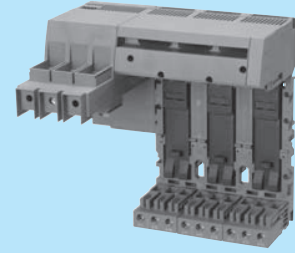


3RA64 / 3RA65 up to 32 A
for mounting rail, surface,
comb busbar, infeed system

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- Accessories 4/9-4/13



3RA68 up to 100 A
for 3RA6 direct and
reversing starters

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Selection and ordering data

- Infeed Components 4/16-4/19
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Combination starters & starters for group installation 3RA1/3RA2



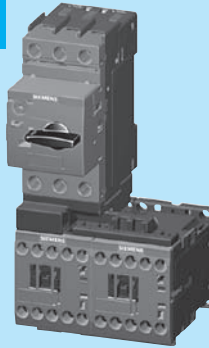
3RA1/3RA2 up to 100 A
for mounting rail and Fast Bus
busbar systems

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3RA11/3RA22 up to 100 A
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Compact Combination Starters

SIRIUS 3RA6 Compact Starters

General data

• Revised •
10/15/15



Overview

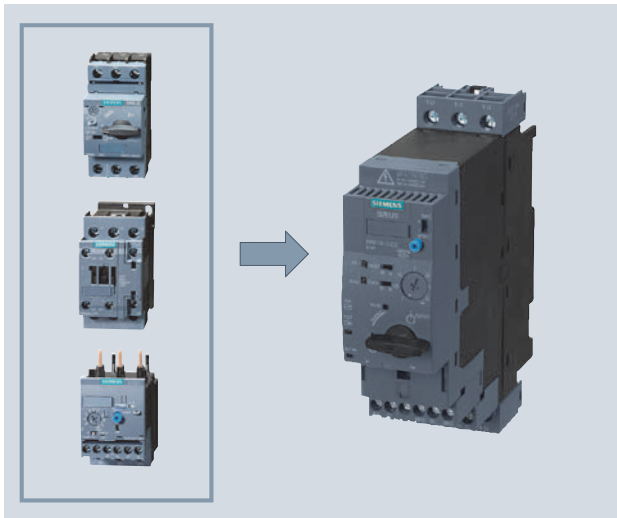
3RA6 fuseless compact starters and infeed system for 3RA6



3RA62 reversing starter

Integrated functionality

The SIRIUS 3RA6 compact starters are a generation of innovative load feeders with the integrated functionality of a motor starter protector, contactor and electronic overload relay. In addition, various functions of optional mountable accessories (e.g. auxiliary switches, surge suppressors) are already integrated in the SIRIUS compact starter.



3RA6 compact starters with the integrated functionality of a motor starter protector, contactor and electronic overload relay.

Applications

The SIRIUS compact starters can be used wherever standard three-phase motors up to 32 A (20 HP/460 V) are directly started.

The compact starters are not suitable for the protection of DC loads.

Approvals according to IEC, UL, CSA and CCC standards have been issued for the compact starters.

Low variance of devices

Thanks to wide setting ranges for the rated current and wide voltage ranges, the equipment variance is greatly reduced compared to conventional load feeders.

Very high operational reliability

The high short-circuit breaking capacity and defined shut-down when the end of service life is reached means that the SIRIUS compact starter achieves a very high level of operational reliability that would otherwise have only been possible with considerable additional outlay. This sets it apart from devices with similar functionality.

Safe disconnection

The auxiliary switches (NC contacts) of the 3RA6 compact starters are designed as mirror contacts. This enables their use for safe disconnection - e.g. EMERGENCY STOP up to SIL 1 (IEC 62061) or PL c (ISO 13849-1) or, if used in conjunction with an additional infeed contactor, up to SIL 3 (IEC 62061) or PL e (ISO 13849-1).

Communications integration through AS-Interface

To enable communications integration through AS-Interface there is an AS-i add-on module available in several versions for mounting instead of the control circuit terminals on the SIRIUS compact starter.

The design of the AS-i add-on module permits a group of up to 62 feeders with a total of four cables to be connected to the control system. This reduces wiring work considerably compared to the parallel wiring method.

Communications integration using IO-Link

Up to 4 compact starters in IO-Link version (reversing and direct-on-line starters) can be connected together and conveniently linked to the IO-Link master through a standardized IO-Link connection. The SIRIUS 4SI electronic modules are used e.g. as IO-Link masters for connection to the SIMATIC ET 200S distributed I/O system.

The IO-Link connection enables a high density of information in the local range.

Details of the communications integration using IO-Link, see [Chapter 14 Communications](#).

The diagnostics data of the process collected by the 3RA6 compact starter, e.g. short circuit, end of service life, limit position etc., are not only indicated on the compact starter itself but also transmitted to the higher-level control system through IO-Link.

Thanks to the optionally available operator panel, which can be installed in the control cabinet door, it is easy to control the 3RA6 compact starters with IO-Link from the control cabinet door.

Permanent wiring / easy replacement

Using the SIRIUS infeed system for 3RA6 (see [page 4/16](#)) it is possible to carry out the wiring in advance without a compact starter needing to be connected.

A compact starter is very easily replaced simply by pulling it out of the device without disconnecting the wiring.

Even with screw connections or mounting on a standard mounting rail there is no need to disconnect any wiring (on account of the removable main and control circuit terminals) in order to replace a compact starter.

Consistent solution from the infeed to the motor feeder

The SIRIUS infeed system for 3RA6 with integrated PE bar is offered as a user-friendly possibility of feeding in summation currents up to 100 A with a maximum conductor cross-section of 2/0 AWG and connecting the motor cable directly without additional intermediate terminals.

Screw and spring-type terminals

The SIRIUS compact starters and the infeed system for 3RA6 are available with screw and spring-type terminals.



• Revised •
10/15/15

Compact Combination Starters

SIRIUS 3RA6 Compact Starters

General data

To comply with the clearance and creepage distances demanded according to UL 508 there are the following infeed possibilities:

Type of infeed	Feeder terminal (according to UL 508, type E)	Type
Conventional wiring	Terminal block for "Self-Protected Combination Motor Controller (Type E)"	3RV29 28-1H
Three-phase busbars	Three-phase infeed terminal for constructing "Type E Starters", UL 508	3RV29 25-5EB
Infeed systems for 3RA6	Infeed on left, 50/70 mm ² , screw terminal with 3 sockets, outgoing terminal with screw/spring-type connections, including PE bar	3RA68 13-8AB (screw terminals), 3RA68 13-8AC (spring-type terminals)

SIRIUS 3RA6 compact starters

The SIRIUS 3RA6 compact starters are universal motor starters according to IEC/EN 60947-6-2. As control and protective switching devices (CPS) they can connect, convey and disconnect the thermal, dynamic and electrical loads from short-circuit currents up to $I_n = 53$ kA, i.e. they are essentially weld-free. They combine the functions of a motor starter protectors, a contactor and a solid-state overload relay in a single enclosure and can be used wherever standard induction motors up to 32 A (up to approx. 20 HP at 480 V AC) are started directly. Available versions are the direct-on-line starters with 45 mm width and the reversing starters with 90 mm width.

The reversing starter version comes with not only an internal electrical interlock but also with a mechanical interlock to prevent simultaneous actuation of both directions of rotation.

3RA6 compact starters are supplied in 5 current setting ranges. The 3RA61 and 3RA62 have 2 control voltage ranges (AC/DC), the 3RA64 and 3RA65 have one control voltage range (DC):

Current setting range	At 460 V AC for induction motors Standard output P	Rated control supply voltage for	
		3RA61, 3RA62 compact starters	3RA64, 3RA65 compact starters for IO-Link
A	HP	V AC/DC	V DC
0.1 ... 0.4	0.12	24	24
0.32 ... 1.25	0.43 ... 1.68	110 ... 240	
1 ... 4	1.34 ... 5.36		
3 ... 12	4.02 ... 16.1		
8 ... 32	10.7 ... 42.9		

Note:

The 3RA1 motor starters can be used as motor starters > 32 A up to 100 A.

The SENTRON 3VL circuit breakers and the SIRIUS 3RT contactors can be used for motor starters > 100 A.

Operating conditions

The SIRIUS 3RA6 compact starters are suitable for use in nearly all climates. They are intended for use in enclosed rooms in which no severe operating conditions (such as dust, caustic vapors, hazardous gases) prevail. Suitable covers must be provided for installation in dusty and damp locations.

The SIRIUS compact starters are generally designed to degree of protection IP20. The permissible ambient temperature during operation is -20 to +60 °C.

The maximum short-circuit current based on UL testing is 30 kA up to 12 A and 15 kA for the 8 ... 32 A versions at 480 V.

Note:

More technical specifications can be found in the system manual at

www.siemens.com/compactstarter

Overload tripping times

The overload tripping time can be set on the device to less than 10 s (CLASS 10) and less than 20 s (CLASS 20 for heavy starting). As the breaker mechanism still remains closed after an overload, resetting is possible by either local manual reset or autoreset after 3 minutes cooling time.

With autoreset there is no need to open the control cabinet.

Diagnostics options

The compact starter provides the following diagnostics options on site:

- With LEDs
 - Connection to the control voltage
 - Position of the main contacts
- With mechanical indication
 - Tripping due to overload
 - Tripping due to short-circuit
 - Tripping due to malfunction (end of service life reached because of worn switching contacts or a worn switching mechanism or faults in the control electronics)

These states can also be evaluated in the higher-level control system:

- With conventional wiring using the integrated auxiliary and signaling switches of the compact starter
- With AS-Interface or IO-Link in even greater detail using the respective communication interface

Four complement variants for 3RA6 compact starters

- For standard mounting rail or screw mounting: basic version including 1 pair of main circuit terminals and 1 pair of control circuit terminals
- For standard mounting rail or screw mounting when using the AS-i add-on module: comes without control circuit terminals because the AS-i add-on module is attached in lieu of them
- For use with the infeed system for 3RA6: without main circuit terminals because they are supplied with the infeed system and the expansion modules
- For use with the infeed system for 3RA6 and AS-i add-on module: without main or control circuit terminals as they are not needed
- The control circuit terminals are always required by the compact starters for IO-Link; the main circuit terminals depend on the use of the infeed system.

Additional components of the 3RA6

The two control circuit terminals on the 3RA61/3RA62 allow access to signalling contacts for overload (1 CO) and short-circuit / malfunction (1 NO). Furthermore, the 3RA61 has two auxiliary contacts (1 NO + 1 NC) for indicating the position of the main contacts, while the 3RA62 has one auxiliary contact (1 NO) per direction of rotation per main contact.

Function

Trip units

The SIRIUS 3RA6 compact starters are equipped with the following trip units:

- Inverse-time delayed solid-state overload release
- Instantaneous electronic trip unit (electromagnetic short-circuit release)

The overload releases can be adjusted in accordance with the load current.

The electronic trip units are permanently set to a value 13 times the maximum rated current of the 4 A, 12 A and 32 A starter and thus enable trouble-free starting of motors.

Trip classes

The trip classes of electronically delayed trip units are based on the tripping time (t_A) at 7.2 times the set current in the cold state (excerpt from IEC 60947-4):

CLASS 10: $4s < t_A < 10s$

CLASS 20: $6s < t_A < 20s$ (for heavy starting)

The compact starter must trip within this time.

Disconnection due to malfunction

The following malfunctions can be detected:

- End of service life
 - Worn switching contacts (for electrical endurance see "Technical data")
 - Worn switching mechanisms (for mechanical endurance see "Technical data")
- Faults in the control electronics

Short-circuit protection

If a short-circuit occurs, the short-circuit releases of the SIRIUS 3RA6 compact starters isolate the faulty motor starter from the network and thus prevent further damage. The short-circuit releases are factory-set to 14 times the value of the maximum rated current I_n of the device.

The SIRIUS compact starters have a short-circuit breaking capacity up to 30 kA at a voltage of 480 V AC.

Overload relay function

In the event of an overload, the compact starter switches off without the breaker mechanism being opened.

The overload trip can be signaled to the higher-level control system through an integrated signal switch.

The overload signal can be reset automatically or by means of a manual reset.

Control through AS-Interface

For control through AS-Interface, the AS-i add-on module is mounted instead of the two control circuit terminals on the SIRIUS 3RA6 compact starters (direct-on-line starters and reversing starters).

The AS-i auxiliary voltage and the AS-i data line are installed on the AS-i add-on module easily and quickly without tools by means of two plug-in connector blocks with insulation displacement connection.

The AS-i add-on module is equipped with the latest A/B technology and has an addressing socket onboard.

An addressing unit is required and can be ordered for addressing the AS-i add-on module.

Bit assignment (see below) is similar to that for the SIRIUS motor starters, which means that the same programming can be used here.

DI 0.0 ready
DI 0.1 motor on
DI 0.2 group fault
DI 0.3 group warning

DO 0.0 motor on or motor clockwise
DO 0.1 motor counterclockwise

A 24 V DC PELV power supply unit according to EN 61140 safety class III is required for the auxiliary voltage.

The AS-i data line is supplied with voltage by means of a 30 V DC AS-i power supply unit and is controlled by means of the AS-i master.

The AS-i add-on modules are available in the following five versions:

- AS-i add-on module for compact starters
- AS-i add-on module for compact starters with two local inputs for safe disconnection of the "clockwise rotation" or "counterclockwise rotation" outputs
- AS-i add-on module with two free external inputs
- AS-i add-on module with two free external outputs
- AS-i add-on module with one free external input and output

The AS-i add-on module can only be used with compact starters with a control voltage of 24 V AC/DC.

Integrated auxiliary switches

The control circuit terminals of the SIRIUS 3RA6 compact starters have the following connections:

- A1/A2 for the control voltage for 3RA61, A1/A2 and B1/B2 for the control voltage for 3RA62
- "Overload" signal switch
- "Fault" signal switch, e. g. "short-circuit"
- Internal auxiliary switch for position of the main contacts (in case of direct-on-line starters: 1 NO + 1 NC with mirror contact to the main contact; in case of reversing starters: 2 NO)



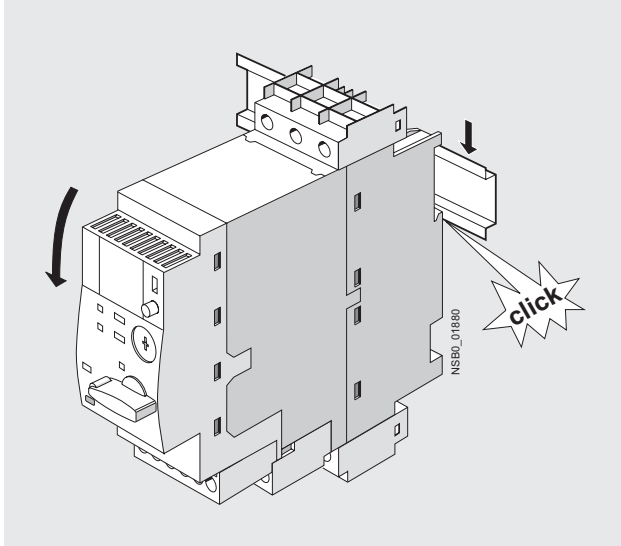
Design

Mounting

The 3RA6 compact starters can be mounted in 4 ways:

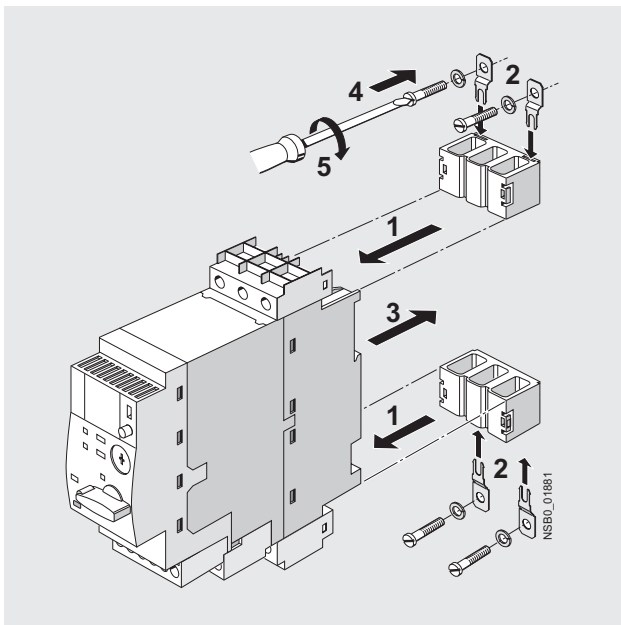
1) By snapping onto a TH 35 standard mounting rail

The SIRIUS compact starters can be snapped onto a standard mounting rail according to EN 60715 with a width of 35 mm.



2) By screw fixing to a flat surface

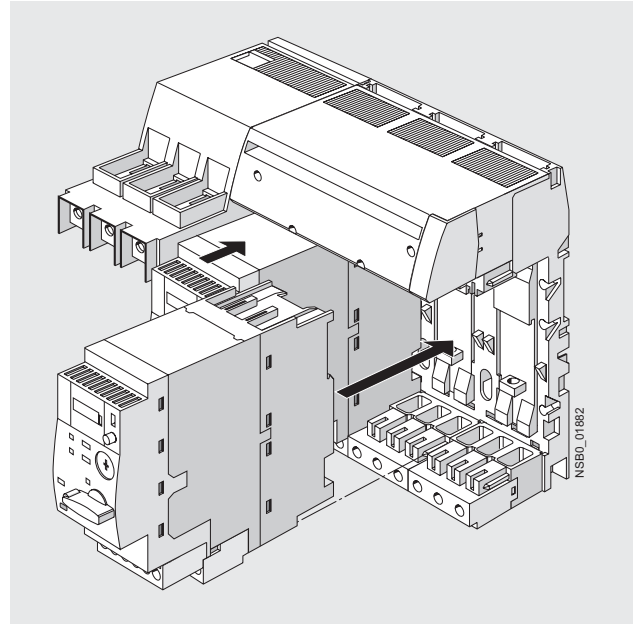
The SIRIUS compact starters are suitable for screw fixing to a flat surface. One set of 3RA69 40-0A adapters for screw connection (including push-in lugs) is required per direct-on-line starter, two sets are required per reversing starter.



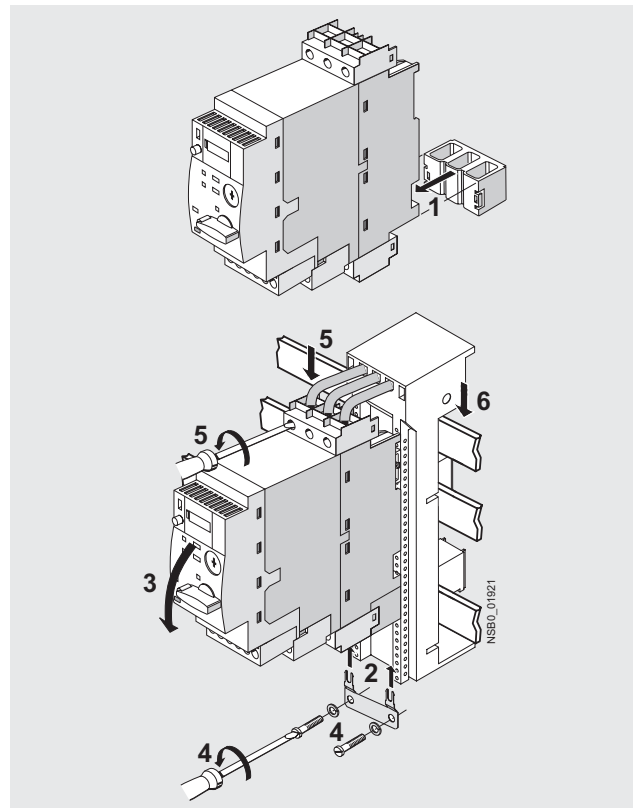
1 ... 5: order of mounting steps

3) By integrating in the infeed system for 3RA6

The SIRIUS compact starters can be assembled with the infeed system for 3RA6 (see "Infeed system for 3RA6").



4) By using the 8US busbar adapter for Fast Bus systems with 60 mm busbar center-to-center clearance



1 ... 6: order of mounting steps

Compact Combination Starters

3RA6 Compact Starters

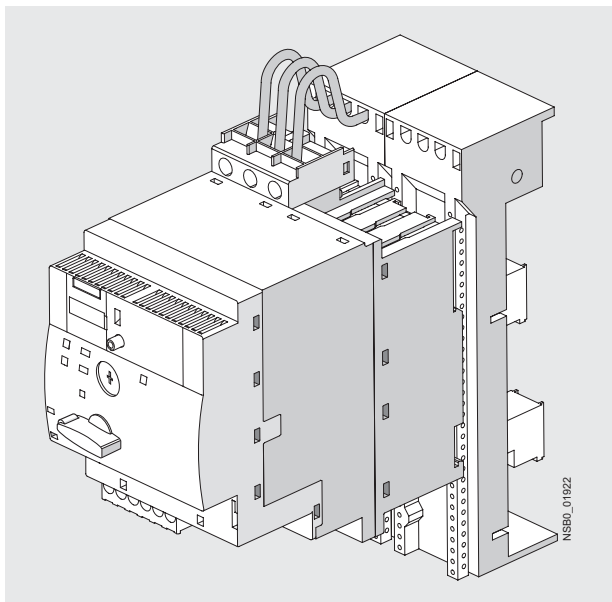


Overview

4a) By using an additional device holder in the case of reversing starters

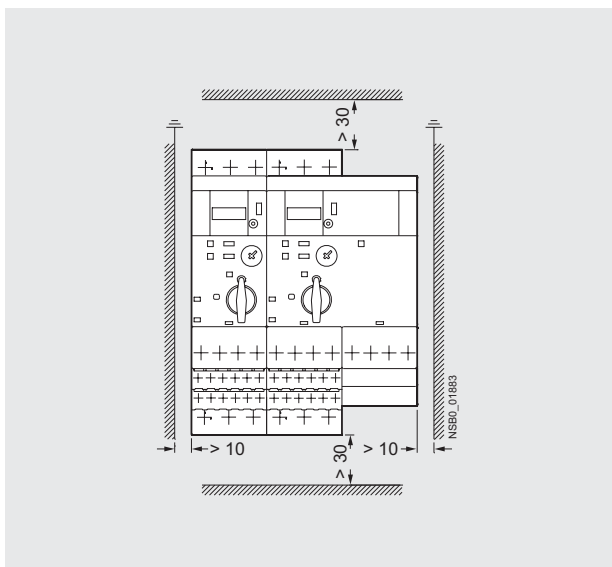
When the 8US busbar adapter is used on Fast Bus systems with 60 mm busbar center-to-center clearance, a device holder is needed in addition for a reversing starter on account of its double width.

The reversing starter is mounted in the same way as the direct-on-line starter on the busbar adapter. Then the device holder is snapped on alongside the busbar adapter.



Mounting regulations

The module can be installed horizontally or vertically. For the different installations attention must be paid however to limit values for protective separation according to IEC/EN 60947-2 of the compact starters (for details see the "Technical specifications").



The following distances must be observed when mounting the compact starters:

- Lateral clearance to grounded components: 10 mm
- Arcing space at top and bottom: 30 mm

Selection and ordering data



3RA61 20-1CB32



3RA61 20-2EB32

Width 45 mm
One set of 3RA69
40-0A adapters
is required for
screw fixing.



3RA62 50-1CP32



3RA62 50-1CP32

Width 90 mm
One set of
3RA69
40-0A adapters
is required for
screw fixing.

Standard induction motor 4-pole at 400 V AC ¹⁾ Standard output <i>P</i>	Setting range for solid-state overload release	Order No.	Order No.
HP	A		
For use with the infeed system for 3RA6 and with the AS-i add-on module or as a replacement device, without main and control circuit terminals			
--	0.1 ... 0.4	3RA6□□0-0A □32	—
1/2	0.32 ... 1.25	3RA6□□0-0B □32	—
2	1 ... 4	3RA6□□0-0C □32	—
7 1/2	3 ... 12	3RA6□□0-0D □32	—
20	8 ... 32	3RA6□□0-0E □32	—
		Screw terminals²⁾	Spring-type terminals
For standard mounting rail or screw mounting, including 1 pair of main circuit terminals and 1 pair of control circuit terminals			
--	0.1 ... 0.4	3RA6□□0-1A □32	3RA6□□0-2A □32
1/2	0.32 ... 1.25	3RA6□□0-1B □32	3RA6□□0-2B □32
2	1 ... 4	3RA6□□0-1C □32	3RA6□□0-2C □32
7 1/2	3 ... 12	3RA6□□0-1D □32	3RA6□□0-2D □32
20	8 ... 32	3RA6□□0-1E □32	3RA6□□0-2E □32
For use in the infeed system for 3RA6, without main circuit terminals, with 1 pair of control circuit terminals			
--	0.1 ... 0.4	3RA6□□0-1A □33	3RA6□□0-2A □33
1/2	0.32 ... 1.25	3RA6□□0-1B □33	3RA6□□0-2B □33
2	1 ... 4	3RA6□□0-1C □33	3RA6□□0-2C □33
7 1/2	3 ... 12	3RA6□□0-1D □33	3RA6□□0-2D □33
20	8 ... 32	3RA6□□0-1E □33	3RA6□□0-2E □33
For standard mounting rail or screw mounting when using the AS-i add-on module with 1 pair of main circuit terminals, without control circuit terminals			
--	0.1 ... 0.4	3RA6□□0-1A □34	3RA6□□0-2A □34
1/2	0.32 ... 1.25	3RA6□□0-1B □34	3RA6□□0-2B □34
2	1 ... 4	3RA6□□0-1C □34	3RA6□□0-2C □34
7 1/2	3 ... 12	3RA6□□0-1D □34	3RA6□□0-2D □34
20	8 ... 32	3RA6□□0-1E □34	3RA6□□0-2E □34
Order No. supplements for rated control supply voltage		12 25 B P	12 25 B P

¹⁾ Selection depends on the motor full load amps. Horse Power ratings provided for reference only.

²⁾ A set of 3RA69 40-0A adapters is required for screw mounting.

Compact Combination Starters

SIRIUS 3RA6 Compact Starters



**3RA64, 3RA65 compact starters
for IO-Link**

Selection and ordering data



3RA64 with 3RA69 11-1A
auxiliary switch block

• Direct-on-line starters

- Rated control supply voltage 24 V DC
- Width 45 mm
- One set of 3RA69 40-0A adapters is required for screw fixing

Standard induction motor 3-pole at 460 V AC Standard output P HP ¹⁾	Setting range for solid-state overload release A	Screw terminals Order No.	Spring-type terminals Order No.
For standard mounting rail or screw mounting, including 1 pair of main circuit terminals and 1 pair of control circuit terminals			
--	0.1 ... 0.4	3RA64 00-1AB42	3RA64 00-2AB42
1/2	0.32 ... 1.25	3RA64 00-1BB42	3RA64 00-2BB42
2	1 ... 4	3RA64 00-1CB42	3RA64 00-2CB42
7 1/2	3 ... 12	3RA64 00-1DB42	3RA64 00-2DB42
20	8 ... 32	3RA64 00-1EB42	3RA64 00-2EB42
For use in the infeed system for 3RA6, without main circuit terminals, with 1 pair of control circuit terminals			
—	0.1 ... 0.4	3RA64 00-1AB43	3RA64 00-2AB43
1/2	0.32 ... 1.25	3RA64 00-1BB43	3RA64 00-2BB43
2	1 ... 4	3RA64 00-1CB43	3RA64 00-2CB43
7 1/2	3 ... 12	3RA64 00-1DB43	3RA64 00-2DB43
20	8 ... 32	3RA64 00-1EB43	3RA64 00-2EB43



3RA65 with 3RA69 11-1A
auxiliary switch block

• Reversing starters

- Rated control supply voltage 24 V DC
- Width 90 mm
- One set of 3RA69 40-0A adapters is required for screw fixing

For standard mounting rail or screw mounting, including 1 pair of main circuit terminals and 1 pair of control circuit terminals			
—	0.1 ... 0.4	3RA65 00-1AB42	3RA65 00-2AB42
1/2	0.32 ... 1.25	3RA65 00-1BB42	3RA65 00-2BB42
2	1 ... 4	3RA65 00-1CB42	3RA65 00-2CB42
7 1/2	3 ... 12	3RA65 00-1DB42	3RA65 00-2DB42
20	8 ... 32	3RA65 00-1EB42	3RA65 00-2EB42
For use in the infeed system for 3RA6, without main circuit terminals, with 1 pair of control circuit terminals			
—	0.1 ... 0.4	3RA65 00-1AB43	3RA65 00-2AB43
1/2	0.32 ... 1.25	3RA65 00-1BB43	3RA65 00-2BB43
2	1 ... 4	3RA65 00-1CB43	3RA65 00-2CB43
7 1/2	3 ... 12	3RA65 00-1DB43	3RA65 00-2DB43
20	8 ... 32	3RA65 00-1EB43	3RA65 00-2EB43

1) Selection depends on the motor full load amps. Horse power ratings provided for reference only.



Overview

Accessories for SIRIUS 3RA6 compact starters

The following accessories are available for the 3RA6 compact starters:

- AS-i add-on module: [see AS-Interface Add-On Modules for 3RA6, page 4/14](#)
- External auxiliary switch blocks: Snap-on auxiliary switch as versions 2 NO, 2 NC and 1 NO + 1 NC with screw or spring-type connections; the contacts of the auxiliary switch block open and close jointly with the main contacts of the compact starter. The NC contacts are designed as mirror contacts.
- Control kit: aid for manually closing the main contacts in order to evaluate the wiring and motor direction under conditions of short-circuit protection
- Adapter for screw mounting the compact starter, including push-in lugs
- Main circuit terminals: Available in screw and spring-type terminals
- Main circuit terminals for mixed connection method: With the main circuit terminal for the mixed connection method it is also possible in the main circuit to change over from the screw connection method on the incoming side to the spring-type connection method on the outgoing side. This enables for example the side-by-side mounting of several compact starters and their cost-effective connection using the three-phase busbars on the infeed side. The motors are then directly connected by the quick and reliably contacting spring-type connection method.

Accessories for UL applications

The terminal block for "Self-Protected Combination Motor Controller", type E is available for complying with the clearance and creepage distances according to UL 508.

Accessories for infeed using three-phase busbar systems

The three-phase busbars can be used as an easy, time-saving and clearly arranged means of feeding SIRIUS 3RA6 compact starters with screw connection. Motor starter protectors size S00 and S0 can also be integrated.

The busbars are suitable for between 2 and 5 devices. However, any kind of extension up to a maximum summation current of 63 A is possible by clamping the terminals of an additional busbar (rotated by 180°) underneath the terminals of the respective last motor circuit protector.

A connecting piece is required for the combination with motor starter protector size S00. S00 and S0 motor starter protectors of the 3RV2 series do not require the additional connecting piece. The motor starter protectors are supplied by appropriate feeder terminals. Special feeder terminals are required for constructing "Type E Starters" according to UL/CSA.

The three-phase busbar systems are finger-safe but empty connection terminals must be fitted with covers. They are designed for any short-circuit stress which can occur at the output side of connected SIRIUS 3RA6 compact starters or motor starter protectors.

8US Fast Bus busbar adapters for 60 mm systems

The compact starters are mounted directly with the aid of busbar adapters on the Fast Bus busbar systems with 60 mm center-to-center clearance in order to save space and to reduce infeed times and costs. These starters are suitable for copper busbars with a width from 12 to 30 mm. The busbars can be 4 to 5 mm or 10 mm thick.

The 8US Fast Bus busbar system can be loaded with a maximum summation current of 630A.

The "reversing starter" version requires a device holder along side the busbar adapter for lateral mounting.

The compact starters are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

For more accessories such as incoming and outgoing terminals, flat copper profiles etc., [see Section 5 "Fastbus Busbar Systems"](#).

Accessories for operation with closed control cabinet doors

Door-coupling rotary operating mechanisms for standard and emergency-stop applications are available for operating the compact starter with closed control cabinet doors.

Accessories for SIRIUS 3RA6 compact starters in IO-Link version

The following accessories are available specifically for the 3RA64, 3RA65 compact starters:

- The 4SI SIRIUS solid-state module as IO-Link master allows for the simple and economical connection of SIRIUS controls with IO-Link (e.g. up to four groups of 4 compact starters) to the multifunctional SIMATIC ET 200S distributed I/O system.
- Additional connection cables for side-by-side mounting of up to 4 compact starters
- Operator panel for local control and diagnostics of up to 4 compact starters coupled to each other

Compact Combination Starters


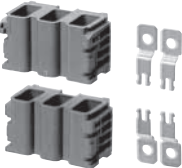







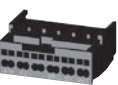
SIRIUS 3RA6 Compact Starters

Accessories

• Revised •
10/15/15



Selection and ordering data

Version		Order No.	Std. pack qty.	Weight approx. kg
Accessories for 3RA6 compact starters				
 3RA69 50-0A	Control kits For mechanical actuation of the compact starter	3RA69 50-0A	1 unit	0.004
	Adapters for screw mounting the compact starter (set including push-in lugs) Direct-on-line starters require 1 set, reversing starters 2 sets.	3RA69 40-0A	1 unit	0.152
 3RA69 40-0A				
 3RA69 11-1A	Auxiliary switch blocks for compact starters • 2 NO • 2 NC • 1 NO +1 NC (these auxiliary contacts are positively driven.)	Screw terminals  3RA69 11-1A 3RA69 12-1A 3RA69 13-1A	1 unit 1 unit 1 unit	0.018 0.018 0.018
	Main circuit terminals (line and load side)	3RA69 20-1A	1 unit	0.038
 3RA69 20-1A				
 3RA69 20-1B	Control circuit terminals • For 3RA61 • For 3RA62	3RA69 20-1B 3RA69 20-1C	1 unit 1 unit	0.042 0.042
 3RA69 11-2A	Auxiliary switch blocks for compact starters • 2 NO • 2 NC • 1 NO +1 NC (these auxiliary contacts are positively driven.)	Spring-type terminals  3RA69 11-2A 3RA69 12-2A 3RA69 13-2A	1 unit 1 unit 1 unit	0.018 0.018 0.018
	Main circuit terminals (line and load side)	3RA69 20-2A	1 unit	0.049
 3RA69 20-2A				
 3RA69 20-2B	Control circuit terminals • For 3RA61 • For 3RA62	3RA69 20-2B 3RA69 20-2C	1 unit 1 unit	0.036 0.036

Version	Order No.	Std. pack qty.	Weight approx. kg
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Accessories for 3RA6 compact starters (continued)



3RA69 20-3A

Main circuit terminals for mixed connection method

One set comprises:

- 1 joint block on the line side for the screw connection method
- 1 joint block on the motor side for the spring-type connection method

3RA69 20-3A

1 unit

0.044

Version	Order No.	Std. pack qty.	Weight approx. kg
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Accessories specifically for 3RA64, 3RA65 compact starters with IO-Link



3RA69 31-0A

Additional connection cables (flat) for side-by-side mounting of up to 4 compact starters

- 10-pole
 - 8 mm¹⁾
 - 200 mm¹⁾
- 14-pole
 - 8 mm²⁾
 - 200 mm

3RA69 32-0A

5 units

0.007

3RA69 33-0B

5 units

0.012

3RA69 31-0A

5 units

0.007

3RA69 33-0C

5 units

0.014



3RA69 35-0A

Operator panels

- 1 operator panel
- 1 enabling module
- 1 interface cover
- 1 fixing terminal

3RA69 35-0A

1 unit

0.052

Enabling block

3RA69 36-0A

1 unit

0.002

Blanking covers

3RA69 36-0B

5 units

0.001

Connection cable (round) for connecting the operator panel

10-pole, 2000 mm

3RA69 33-0A

1 unit

0.114



3RK1 005-0LB00-0AA0

SIRIUS 4SI solid-state modules

IO-Link master for connection of up to 4 SIRIUS controls (max. 16 in groups of 4) with IO-Link (3-wire connection) to SIMATIC ET 200S, width 15 mm, supports firmware update (STEP 7 V5.4 SP5 and higher) Can be used with the following terminal modules:

- TM-E15S26-A1 (screw terminals)
- TM-E15C26-A1 (spring-type terminals)
- TM-E15N26-A1 (Fast Connect)

3RK1 005-0LB00-0AA0

1 unit

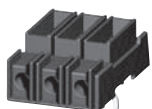
0.057

¹⁾ 10-pole connection cables are required for EMERGENCY-STOP group concepts.

²⁾ Is included in the scope of supply of the SIRIUS 3RA6 compact starter in IO-Link version.

Version	Order No.	Std. pack qty.	Weight approx. kg
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Terminal blocks and phase barriers for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508



3RV29 28-1H

Note:

UL 508 demands 1-inch clearance and 2-inch creepage distance on the line side for "Combination Motor Controller Type E". The following terminal blocks or phase barriers must be used in 3RV20 motor starter protectors.

The terminal blocks or phase barriers cannot be used in combination with the 3RV19 .5 three-phase busbars.

For construction with three-phase busbars, see "Busbar accessories".

Terminal blocks type E

For extended clearance and creepage distances (1 and 2 inch)

S00, S0

3RV29 28-1H

1 unit

0.065

Compact Combination Starters

SIRIUS 3RA6 Compact Starters

Accessories

• Revised •
10/26/15



	Modular spacing			Number of motor starter protectors that can be connected	Rated current I_n at 690 V	For motor starter protectors	Order No.	Std. pack qty.	Weight approx.
	Without lateral accessories	With lateral auxiliary switch	With auxiliary release						
	mm			A	Size				
Three-phase busbars¹⁾									
For feeding several motor starter protectors with screw terminals, mounted side by side on standard mounting rails, insulated, with touch protection									
 3RV1915-1AB	45 ³⁾	2	--	--	63	S00, S0 ²⁾	3RV1915-1AB 3RV1915-1BB 3RV1915-1CB 3RV1915-1DB	1 unit 1 unit 1 unit 1 unit	0.044 0.071 0.099 0.124
		3	--	--	63	S00, S0 ²⁾			
		4	--	--	63	S00, S0 ²⁾			
		5	--	--	63	S00, S0 ²⁾			
 3RV1915-1BB	55 ⁴⁾	--	2	--	63	S00, S0 ²⁾	3RV1915-2AB 3RV1915-2BB 3RV1915-2CB 3RV1915-2DB		
		--	3	--	63	S00, S0 ²⁾			
		--	4	--	63	S00, S0 ²⁾			
		--	5	--	63	S00, S0 ²⁾			
 3RV1915-1CB		2	--	--	108	S2	3RV1935-1A 3RV1935-1B 3RV1935-1C		
		3	--	--	108	S2			
		4	--	--	108	S2			
		--	--	--	--	--			
 3RV1915-1DB	63 ⁵⁾	--	--	2	63	S00, S0 ²⁾	3RV1915-3AB 3RV1915-3CB		
		--	--	4	63	S00, S0 ²⁾			
		--	--	--	--	--			
		--	--	--	--	--			
	75 ⁵⁾	--	2	2	108	S2	3RV1935-3A 3RV1935-3B 3RV1935-3C		
		--	3	3	108	S2			
		--	4	4	108	S2			
		--	--	--	--	--			




¹⁾ Not suitable for 3RV21 motor starter protectors for motor protection with overload relay function and for 3RV27 and 3RV28 circuit breakers according to UL 489/CSA C22.2 No. 5.

²⁾ Approved for motor starter protectors size S0 with $I_n \leq 32$ A.

³⁾ For 3RV2 motor starter protectors without accessories mounted on the side.

⁴⁾ For 3RV2 motor starter protectors with auxiliary switches with 1 NO + 1 NC, 2 NO and 2 NC mounted on the left (9 mm wide).

⁵⁾ For 3RV2 motor starter protectors with mounted accessories (18 mm wide). Auxiliary switches with 2 NO + 2 NC or signaling switch (mounted on the left) or with auxiliary release (mounted on the right).

Conductor cross-section		Tightening torque	For motor starter protectors/circuit breakers	Order No.	Weight approx.
Solid or stranded	Finely stranded with end sleeve				
mm²	mm²	AWG	Nm	Size	
Three-phase infeed terminals					
 3RV2925-5AB	Connection from top				
	2.5 ... 25	2.5 ... 16	10 ... 4	3 ... 4	S00, S0
	2 x	2 x	2 x	4 ... 6	S2 NEW
	(2.5 ... 50) ¹⁾	(2.5 ... 35) ¹⁾	(10 ... 1/0) ¹⁾		
	1 x	1 x	1 x		
	(2.5 ... 70) ¹⁾	(2.5 ... 50) ¹⁾	(10 ... 2/0) ¹⁾		
 3RV2935-5A					
 3RV2915-5B	Connection from below				
	This terminal is connected in place of a switch, please take the space requirement into account.				
	2.5 ... 25	2.5 ... 16	10 ... 4	Input: 4, Output: 2 ... 2.5	S00, S0

¹⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

Version	Order No.	Std. pack qty.	Weight approx. kg
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8US Fast Bus busbar adapters for 60 mm systems



8US12 11-1NS10

For flat copper profiles according to DIN 46433
Width: 12 ... 30 mm
Thickness: 4 ... 5 mm or 10 mm

8US12 11-1NS10

1 unit

0.337

Device holders for lateral mounting along side the Fast Bus busbar adapter for 60 mm systems



8US12 50-1AA10

Required in addition to the busbar adapter for mounting a reversing starter

8US12 50-1AA10

1 unit

0.239

Version	Color of handle	Version of extension shaft mm	Order No.	Std. pack qty.	Weight approx. kg
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Door-coupling rotary operating mechanisms for operating the compact starter with closed control cabinet doors



3RV29 26-0B

The door-coupling rotary operating mechanisms consist of a knob, a coupling driver and an extension shaft of 130/330 mm in length (6 mm x 6 mm). The door-coupling rotary operating mechanisms are designed to degree of protection IP65. The door interlocking prevents accidental opening of the control cabinet door in the ON position of the motor starter protector. The OFF position can be locked with up to 3 padlocks.

Door-coupling rotary operating mechanisms

Black

130

3RV29 26-0B

1 unit

0.111

EMERGENCY-STOP door-coupling rotary operating mechanisms

Red/
Yellow

130

3RV29 26-0C

1 unit

0.110

Version	Order No.	Std. pack qty.	Weight approx. kg
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Tools for opening spring-type terminals by hand



3RA29 08-1A

Screwdrivers
for all SIRIUS devices with spring-type terminals
Length approx. 200 mm,
3.0 mm x 0.5 mm,
titanium gray/black,
partially insulated

Spring-type terminals

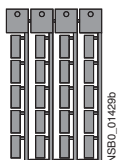


3RA29 08-1A

1 unit

0.045

Blank labels



3RT19 00-1SB20

Unit labeling plates¹⁾
for SIRIUS devices
20 mm x 7 mm,
titanium gray

3RT19 00-1SB20

340 units

0.200

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: Murrplastik Systems, Inc. www.murrplastik.com.

Compact Combination Starters

SIRIUS 3RA6 Compact Starters



Add-on modules for AS-Interface

Overview

Various AS-i add-on modules are available for communication of the 3RA6 compact starter with the control system using AS-Interface:

- Standard version
- With two local inputs
- With two free external inputs
- With one free external input and one free external output
- With two free external outputs
- For local control

The AS-i add-on modules can be combined only in connection with compact starters with a rated control supply voltage of 24 V AC/DC.

AS-i add-on module for communications controlling

With this new module it is also possible for the connected compact starter to be operated directly using simple switches, i.e. without recourse to AS-i Communication, if required.

"Automatic" mode

NC contacts can be connected to the inputs Y2 and Y4 through the local terminals on the AS-i add-on module. If the "+" connections are connected simultaneously to both local inputs, the AS-i add-on module will be in "Automatic" mode, i.e. it will communicate with the control system through AS-Interface.

Local control

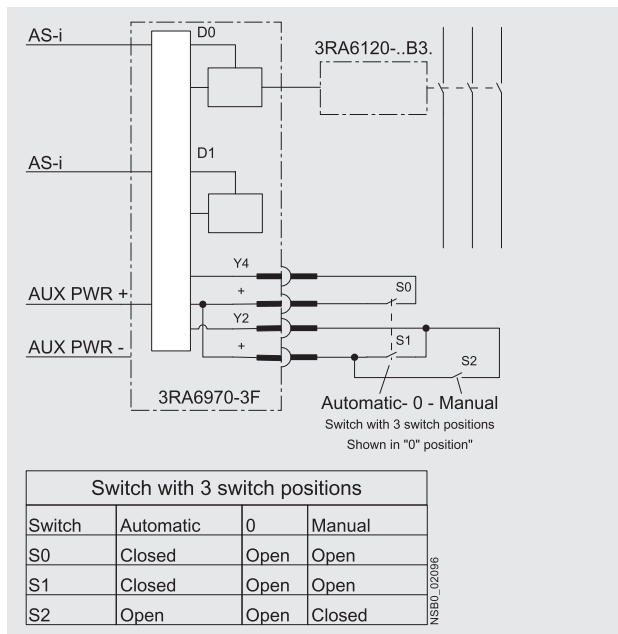
Opening the two inputs Y2 and Y4 will result in the direct disconnection of the compact starter. Operation through AS-i Communication is ended and the compact starter can now be switched on and off directly using NO contacts (one NO contact per direction of rotation on the reversing starter).

"LED AUX Power" must light up green, the 24 V DC supply must be connected and the AS-i control supply voltage must no longer be applied.

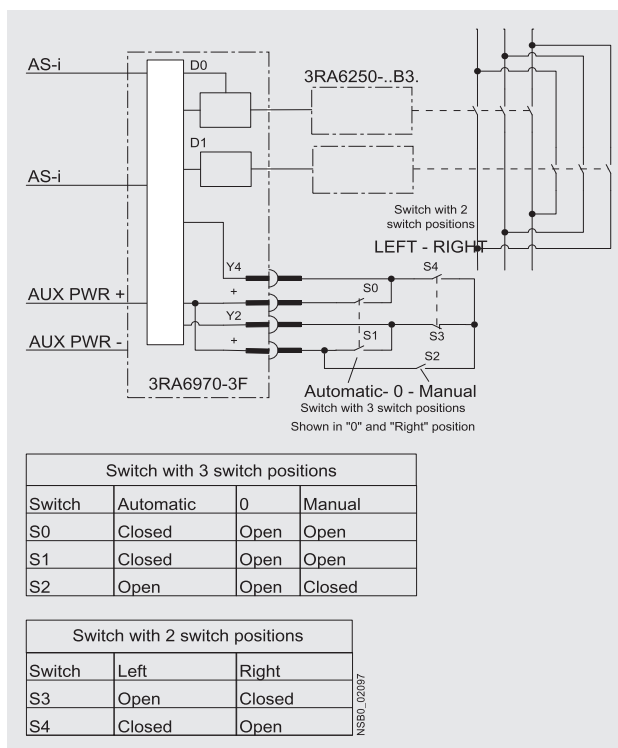
Resetting to "Automatic" mode

Simultaneous application of a "1" signal at the local inputs. The availability bit DI 0 is switched to a "1" signal.

If AS-i Communication is reset, the motor is first switched off and then on again when requested by the control system.






Circuit diagram example for operating a 3RA61 20 direct-on-line starter using an AS-i add-on module for on-site controller



Circuit diagram example for operating a 3RA62 50 reversing starter using an AS-i add-on module for on-site controller

Selection and ordering data

Version		Order No.	Std. pack qty.	Weight approx. kg
AS-i add-on modules				
 3RA69 70-3A  3RA69 70-3B to -3F	Standard version For communication of the compact starter with the control system using AS-Interface	3RA69 70-3A	1 unit	0.045
	With two local inputs For safe disconnection through local safety relays, e.g. cable-operated switches	3RA69 70-3B	1 unit	0.045
	With two free external inputs Replaces the digital standard inputs "Motor On" and "Group warning"	3RA69 70-3C	1 unit	0.045
	With one free external input and one free external output Replaces the digital standard input "Group warning"	3RA69 70-3D	1 unit	0.045
	With two free external outputs Only for direct-on-line starters, replaces the digital standard output "Motor left"	3RA69 70-3E	1 unit	0.045
	For local control Control of the compact starter optionally using AS-Interface or local switches	3RA69 70-3F	1 unit	0.045
Spare parts for AS-i add-on modules				
	Connectors for data and auxiliary supply cable with 2 insulation displacement terminations for standard litz wires 2 x 0.5 ... 0.75 mm ² <ul style="list-style-type: none"> • Flat, yellow, extender • Flat, black, extender 	3RK1901-0NA00 3RK1901-0PA00	5 units 5 units	
Accessories for AS-i add-on modules				
 3RK1904-2AB02	AS-Interface addressing unit V 3.0 <ul style="list-style-type: none"> • For AS-Interface modules and sensors and actuators with integrated AS-Interface in accordance with AS-i Specification V3.0 • For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves) • With input/output test function and many other commissioning functions • Battery operation with 4 batteries type AA (IEC LR6, NEDA 15) • Scope of supply: <ul style="list-style-type: none"> - Addressing unit with 4 batteries - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5m 	3RK1904-2AB02	1 unit	0.540



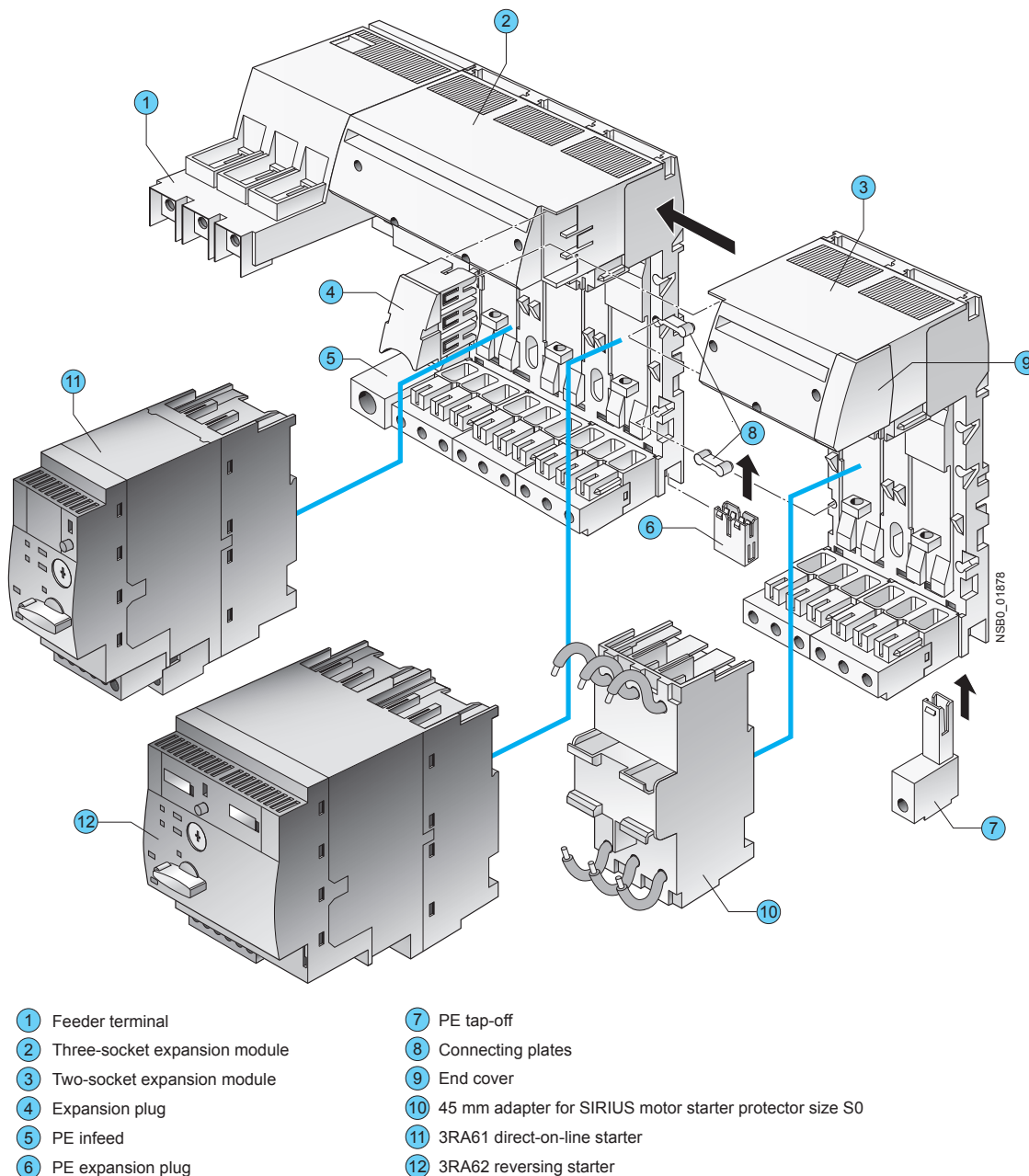
Overview

The infeed system for 3RA6 compact starters enables far less wiring in the main circuit and, thanks to the easy exchangeability of the compact starters, reduces the usual downtimes for maintenance work during the plant's operating phase.

The infeed system provides the possibility of completely prewiring the main circuit without a compact starter needing to be connected at the same time. As the result of the removable terminals in the main circuit, compact starters can be integrated in an infeed system in an easy manner (without the use of tools).

In addition, the integrated PE bar means it is optionally possible to connect the motor cable directly to the infeed system without additional intermediate terminals. The infeed system for 3RA6 compact starters is designed for summation currents up to 100 A with a conductor cross-section of max. 2/0 AWG on the feeder terminal block.

The infeed system can be mounted on a standard mounting rail or flat surfaces.



Infeed system for 3RA6 compact starters



1 Infeed

The 3-phase infeed is available as an infeed with screw connection (4-2 AWG up to 63 A or 0-2/0 AWG up to 100 A) and an infeed with spring-type connection (4-2 AWG up to 63 A).

The infeed with spring-type terminal can be attached to the left side, as well as the right side, of an expansion module.

The screw terminal infeeds are permanently fitted to the left side of a 3-socket expansion module.

The infeeds with screw connection enable connection of the main conductors (L1, L2, L3) either from above or from below.

The infeeds with screw connection come packaged with 1 end cover, while the infeed with spring-type connection comes packaged with 2 end covers.

2 Three-socket expansion modules

The expansion module with 3 sockets for compact starters is available with screw connection and with spring-type connection.

Expansion modules enable the infeed system to be expanded and can be connected to each other in any number up to a maximum length of 1.2 meters.

Two expansion modules are held together with the help of 2 connecting plates and 1 expansion plug. These assembly parts are included in the scope of supply of the respective expansion module.

When the infeed system for 3RA6 compact starters is used, the compact starters (plug-in modules) are easily mounted and removed even when live.

Optional possibilities:

- PE connection on motor starter side
- Outfeed for external auxiliary devices
- Connection to 3RV29 infeed system
- Integration of SIRIUS 3RV1 and 3RV2 motor starter protectors size S0 up to 25 A (using 3RA68 90-0BA adapter)

3 Two-socket expansion modules

If only 2 instead of 3 additional sockets are required, then the 2-socket expansion module is the right choice. It has the same functionality as the 3-socket expansion module.

4 Expansion plug

Two expansion modules can be connected together using the expansion plug. Flexible expansion of the infeed system is thus possible.

5 PE infeeds

This module enables a PE cable to be connected.

The PE infeed can be ordered with screw connection and spring-type connection (2 AWG) and can be fitted on the right or left to the expansion block.

6 PE expansion plug

The PE expansion plug is inserted from below and enables two PE bars to be connected.

7 PE tap-off

The PE tap-off is available with screw connection and spring-type connection (10-8 AWG). It is snapped into the infeed system from below.

8 Connecting plates

Two connecting plates are used to hold together 2 adjacent expansion modules.

9 End covers

On the last expansion module of a row, the slot provided for the expansion plug can be covered by inserting the end cover.

Compact Combination Starters

SIRIUS 3RA6 Compact Starters

Infeed systems for 3RA6
up to 100 A

10 45 mm adapters for SIRIUS 3RV motor starter protectors

SIRIUS 3RV1 and 3RV2 motor starter protectors size S0 with screw connection can be fitted to the adapter, enabling them to be plugged into the infeed system.

Terminal blocks

Using the terminal block, three phase power can be fed out of the infeed system; this means that single-phase, two-phase and three-phase components can also be integrated in the system.

If the end cover is removed, the terminal block can be inserted into an expansion module.

Expansion plug for SIRIUS 3RV29 infeed systems

If the end cover is removed, the expansion plug for the SIRIUS 3RV29 infeed system can be inserted into an expansion module. It connects the infeed system for 3RA6 compact starters with the SIRIUS 3RV29 infeed system.

Maximum rated operational current

The following maximum rated operational currents apply for the components of the infeed system for 3RA6:

Component	Maximum rated operational current A
Infeed with screw connection 0-2/0 AWG	100
Infeed with screw connection 4-2 AWG	63
Infeed with spring-type connection 4-2 AWG	63
Expansion plugs	63

When several expansion modules are mounted side by side, the maximum rated operational current from the 2nd expansion module to the end of the row is 63 A.

Proposal for upstream short-circuit protection devices

The following short-circuit data apply for the components of the infeed system for 3RA6 compact starters:

Conductor cross-section AWG	Inscriptions	Proposal for upstream short-circuit protection device
Short-circuit protection for infeed block (4-2 AWG) with screw connection		
14-2	$I_{d, \max} = 19 \text{ kA}$, $I^2t = 440 \text{ kA}^2\text{s}$	3RV10 41-4JA10
Short-circuit protection for infeed block (0-2/0 AWG) with screw connection		
14-2/0	$I_{d, \max} = \text{approx. } 22 \text{ kA}$	3RV10 41-4MA10
Short-circuit protection for infeed block with spring-type connection		
12	$I_{d, \max} = 9.5 \text{ kA}$, $I^2t = 85 \text{ kA}^2\text{s}$	3RV10 21-4DA10
10	$I_{d, \max} = 12.5 \text{ kA}$, $I^2t = 140 \text{ kA}^2\text{s}$	3RV10 31-4EA10
8	$I_{d, \max} = 15 \text{ kA}$, $I^2t = 180 \text{ kA}^2\text{s}$	3RV10 31-4HA10
6-4	$I_{d, \max} = 19 \text{ kA}$, $I^2t = 440 \text{ kA}^2\text{s}$	3RV10 41-4JA10
Short-circuit protection for terminal block		
16	$I_{d, \max} = 7.5 \text{ kA}$	5SY... 1)
14	$I_{d, \max} = 9.5 \text{ kA}$	
12	$I_{d, \max} = 9.5 \text{ kA}$	
10	$I_{d, \max} = 12.5 \text{ kA}$	

1) To prevent the possibility of short-circuits, the cables on the terminal block must be installed so that they are short-circuit proof according to EN 60439-1 Section 7.5.5.1.2.

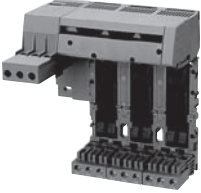



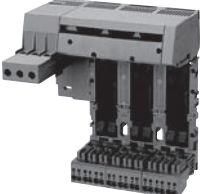

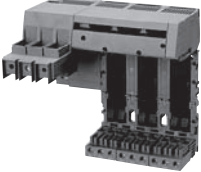

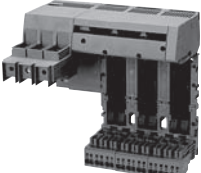



Compact Combination Starters

SIRIUS 3RA6 Compact Starters



Infeed systems for 3RA6
up to 100 A

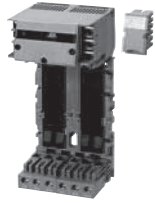
Selection and ordering data

Version		Order No.	Weight approx. kg
Three-phase infeeds and expansion modules			
 3RA68 12-8AB	Infeeds with screw connection 4-2 AWG left Infeed with screw connection with permanently fitted 3-socket expansion module with screw or spring-type terminals on the outgoing side and integrated PE bar Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter	Screw terminals 	
	<ul style="list-style-type: none"> Screw terminals on outgoing side  Spring-type terminals on outgoing side  	3RA68 12-8AB 3RA68 12-8AC	0.957 0.990
 3RA68 12-8AC	Infeeds with screw connection 0-2/0 AWG left Infeed with screw connection with permanently fitted 3-socket expansion module with screw or spring-type terminals on the outgoing side and integrated PE bar Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter, suitable for UL duty according to UL 508 Type E	Screw terminals 	
 3RA68 13-8AB	Infeeds with screw connection 0-2/0 AWG left Infeed with screw connection with permanently fitted 3-socket expansion module with screw or spring-type terminals on the outgoing side and integrated PE bar Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter, suitable for UL duty according to UL 508 Type E	Screw terminals 	
 3RA68 13-8AC	Infeeds with screw connection 0-2/0 AWG left Infeed with screw connection with permanently fitted 3-socket expansion module with screw or spring-type terminals on the outgoing side and integrated PE bar Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter, suitable for UL duty according to UL 508 Type E	Screw terminals 	
 3RA68 30-5AC	Infeeds with spring-type connection 4-2 AWG left or right Up to 63 A	Spring-type terminals 	
		3RA68 30-5AC	0.283

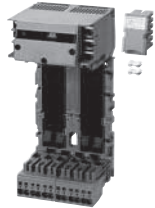


Version	Order No.	Weight approx. kg
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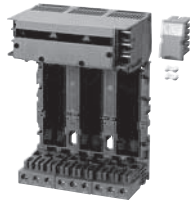
Expansion modules



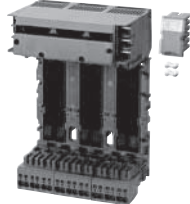
3RA68 22-0AB



3RA68 22-0AC



3RA68 23-0AB



3RA68 23-0AC

Two-socket expansion modules

With screw or spring-type terminals
and integrated PE bar
with 2 sockets for 2 direct-on-line starters or
1 reversing starter
Expansion plug and 2 connecting plates
are included in the scope of supply.

- Screw terminals

Screw terminals**3RA68 22-0AB**

0.505

- Spring-type terminals

Spring-type terminals**3RA68 22-0AC**

0.527

Three-socket expansion modules

With screw or spring-type terminals
and integrated PE bar
with 3 sockets for 3 direct-on-line starters or
1 direct-on-line starter and 1 reversing starter
Expansion plug and 2 connecting plates
are included in the scope of supply.

- Screw terminals

Screw terminals**3RA68 23-0AB**

0.717

- Spring-type terminals

Spring-type terminals**3RA68 23-0AC**

0.750

Compact Combination Starters

SIRIUS 3RA6 Compact Starters

Infeed systems for 3RA6

• Revised •
10/15/15



Accessories

Version		Order No.	Weight approx. kg
Accessories for 3RA6 infeed systems			
<i>PE infeeds 4-2 AWG</i>			
 3RA68 60-6AB	• Screw terminals	Screw terminals  3RA68 60-6AB	0.060
	• Spring-type terminals	Spring-type terminals  3RA68 60-5AC	0.070
 3RA68 60-5AC			
<i>PE tap-offs 10-8 AWG</i>			
 3RA68 70-4AB	• Screw terminals	Screw terminals  3RA68 70-4AB	0.019
	• Spring-type terminals	Spring-type terminals  3RA68 70-3AC	0.017
 3RA68 70-3AC			
<i>Expansion plugs</i>			
 3RA68 90-0EA	PE expansion plugs	3RA68 90-0EA	0.008
 3RA68 90-1AB	Expansion plugs between 2 expansion modules Is included in the scope of supply of the expansion modules.	3RA68 90-1AB	0.029
 3RA68 90-1AA	Expansion plugs for SIRIUS 3RV19/29 infeed system Connects infeed system for 3RA6 to 3RV29 infeed systems	3RA68 90-1AA	0.079

Version	Order No.	Weight approx.
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Accessories for infeed systems for 3RA6 (continued)



3RA6890-0BA

45 mm adapters

For SIRIUS 3RV1.2 and 3RV2.2 motor starter protectors. Size S0 up to 25 A

- Screw terminals (conductor cross-section AWG 10)

Screw terminals



3RA6890-0BA

0.152



3RA6880-2AB

Terminal covers for infeeds with screw connection

IP20 terminal covers for infeeds with screw connection 25/35 mm² (3RA6812-8AB/AC)

(2 units per pack)

3RA6880-2AB

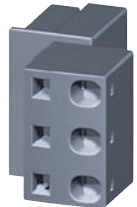


3RA6880-3AB

IP20 terminal covers for infeeds with screw connection 50/70 mm² (3RA6813-8AB/AC)

(2 units per pack)

3RA6880-3AB



3RV2917-5D

Terminal blocks

For integration of single-phase, 2-phase and 3-phase external components

- Spring-type terminals

Spring-type terminals



3RV2917-5D

.0.050

Tools for opening spring-type terminals



3RA2908-1A

Screwdrivers

For all SIRIUS devices with spring-type terminals

Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated

Spring-type terminals



3RA2908-1A

.0.045

System Manual "SIRIUS Compact Starters and Accessories"

The system manual can be downloaded free of charge in PDF format from the Internet, see <http://support.automation.siemens.com/WW/view/en/27136554/133300>

Compact Combination Starters

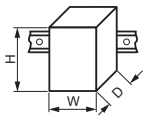
SIRIUS 3RA6 Compact Starters

General data

• Revised •
10/15/15



More information

Type			3RA61	3RA62	3RA64	3RA65
Size			S0			
Number of poles			3			
General technical specifications						
Device standard			IEC/EN 60947-6-2			
Mounting dimensions (WxHxD)						
• Screw terminals						
• Spring-type terminals						
		mm	45 x 170 x 165	90 x 170 x 165	45 x 170 x 165	90 x 170 x 165
		mm	45 x 191 x 165	90 x 191 x 165	45 x 191 x 165	90 x 191 x 165
Weight		kg	1.4	2.3 -2.4	1.3	2.3
Permissible mounting positions			No restrictions, preferably vertical or horizontal installation			
Max. rated current I_e						
in the respective setting range	0.1 ... 0.4 A	A	0.4			
	0.32 ... 1.25 A	A	1.25			
	1 ... 4 A	A	4			
	3 ... 12 A	A	12			
	8 ... 32 A	A	32			
Permissible ambient temperature						
• During operation	Acc. to IEC/EN 60721-3-3	°C	-20 ... +60, with derating up to +70			
• For installation in SIRIUS infeed system for 3RA6		°C	-20 ... +40			
• During storage	IEC/EN 60732-3-1	°C	-55 ... +80			
• During transport	IEC/EN 60721-3-2	°C	-55 ... +80			
Permissible rated current of the compact starter,						
when several compact starters are mounted side-by-side on a vertical standard mounting rail or in the 3RA6 infeed system						
• For a control cabinet inside temperature of	+40 °C	%	100			
• For a control cabinet inside temperature of	+60 °C	%	80			
• For a control cabinet inside temperature of	+70 °C	%	60			
Relative air humidity		%	10 ... 90			
Installation altitude		m	Up to 2000 above sea level without restriction			
Rated frequency		Hz	50/60			
Rated insulation voltage U_i		V	690			
(pollution degree 3)						
Rated impulse withstand voltage U_{imp}		kV	6			
Trip class (CLASS)	Acc. to IEC 60947-4-1, EN 60947-4-1		10/20			
Rated short-circuit current I_q at AC 50/60 Hz 480 V	Acc. to IEC 60947-4-1, EN 60947-4-1	kA	30 (up to 12 A units) 15 (8 ... 32 A unit)			
Types of coordination	Acc. to IEC 60947-6-2, EN 60947-6-2		Continuous			
Power loss $P_{v,max}$ of all main current paths						
Dependent on the rated current I_e (upper setting range)	0.4 A	mW	10			
	1.25 A	mW	100			
	4 A	W	1			
	12 A	W	1.8			
	32 A	W	5.4			
Max. switching frequency	AC-41	1/h	750			
	AC-43	1/h	250			
	AC-44	1/h	15			
Drive losses						
Active power	At 24 V					
	• 0.1 ... 12 A	W	2.7			
	• 8 ... 32 A	W	2.95			
	At 110 ... 240 V					
	• 0.1 ... 12 A	W	3.4			
	• 8 ... 32 A	W	3.8			
Overload function						
Ratio of lower to upper current mark			1:4			
Shock resistance (sine-wave pulse)			$a = 60 \text{ m/s}^2 = 6 \text{ g}$ with 10 ms; for every 3 shocks in all axes			
Vibratory load			$f = 4 \dots 5.8 \text{ Hz}$; $d = 15 \text{ mm}$; $f = 5.8 \dots 500 \text{ Hz}$; $a = 20 \text{ m/s}^2$; 10 cycles			
Degree of protection	Acc. to IEC 60947-1		IP20			
Touch protection	Acc. to IEC/EN 61140		Finger-safe			
Isolating features of the compact starter	Acc. to IEC/EN 60947-3		Yes: Isolation is assured only by moving the actuator into the "OFF" position			
Main and EMERGENCY-STOP switch characteristics of the compact starter and accessories	Acc. to IEC 60204		Yes			

Type		3RA61	3RA62	3RA64	3RA65
Size		S0			
Number of poles		3			
General technical specifications (continued)					
Protective separation	Acc. to IEC 60947-2				
Control circuit to auxiliary circuit					
• Horizontal standard mounting rail		V	Up to 400		
• Other mounting position		V	Up to 250		
Auxiliary circuit to auxiliary circuit					
• Horizontal standard mounting rail		V	Up to 400		
• Other mounting position		V	Up to 250		
Main circuit to auxiliary circuit					
• Any mounting position		V	Up to 400		
EMC interference immunity	Acc. to IEC/EN 60947-1				
Conductor-related interference	BURST acc. to IEC/EN 61000-4-4				
• In the main circuit		kV	4		4
• In the auxiliary circuit		kV	3		2
Conductor-related interference	SURGE acc. to IEC/EN 61000-4-5				
• In the main circuit					
- Conductor - Ground		kV	4		2
- Conductor - Conductor		kV	2		1
• In the auxiliary circuit					
- Conductor - Ground		kV	2		0.5 ¹⁾
- Conductor - Conductor		kV	1		0.5 ¹⁾
Auxiliary switches					
• Integrated					
- Position of the main contacts			1 NO + 1 NC	2 NO	1 NO + 1 NC
- Overload/short-circuit signal			1 CO/1 NO		2 NO
• Expandable					
- Position of the main contacts			2 NO, 2 NC, 1 NO + 1 NC		
Surge suppressors					
			Integrated (Varistor)		
Pollution degree			3		
Depth from standard mounting rail	mm	160			
Electromagnetic operating mechanism					
Control voltage					
	V	24 AC/DC		24 DC	
	V	110 ... 240 AC/DC		--	
Frequency	At AC	Hz	50/60 (±5%)		
Primary operating range			0.7 ... 1.25 U_s	0.85 ... 1.2 U_s	
No-load switching frequency		1/h	3600		
Make-time		ms	max. 70	Max. 70 + IO-Link communication	
Break-time		ms	max. 120	Max. 120 + IO-Link communication	

¹⁾ To maintain maximum interference immunity in a harsh electromagnetic environment, additional overvoltage protection should be provided in the control supply current circuit. A suitable choice is for example the Dehn Blitzductor BVT AD 24 V, Art. No. 918 402 or an equivalent protective element.
Manufacturer: DEHN+SÖHNE GmbH+Co. KG, Hans-Dehn-Straße. 1, Postfach 1640, D-92306 Neumarkt

Compact Combination Starters

SIRIUS 3RA6 Compact Starters

General data

• Revised •
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Type		3RA61 20-□B3., 3RA62 50-□B3. □ = A, B, C or D Rated operational current ≤12 A				3RA61 20-.EB3., 3RA62 50-.EB3. Rated operational current 32 A			
Rated control supply voltage	V	24 AC		24 DC		24 AC		24 DC	
Inrush peak current	A	0.59		0.47		0.59		0.47	
Hold current	A	0.13		0.12		0.17		0.14	
Closed	W	2.8		2.9		3.5		3.1	
Operating times, typical									
• On	ms	<160		<140		<160		<140	
• Off	ms	<35		<35		<30		<30	
Type		3RA61 20-□E3., 3RA62 50-□P3. □ = A, B, C or D Rated operational current ≤12 A				3RA61 20-.EE3., 3RA62 50-.EE3. Rated operational current 32 A			
Rated control supply voltage	V	110 AC		240 AC		110 AC		240 AC	
Inrush peak current	A	0.24		0.40		0.24		0.40	
Hold current	A	0.06		0.08		0.06		0.07	
Closed	W	3.8		6		3.7		5.2	
Operating times, typical									
• On	ms	<160		<140		<160		<140	
• Off	ms	<50		<80		<40		<60	
Type		3RA64 00-□B4., 3RA65 00-□B4. □ = A, B, C or D Rated operational current ≤12A				3RA64 00-.EB4., 3RA65 00-.EB4. Rated operational current 32 A			
Rated control supply voltage	V	24 DC				24 DC			
Inrush peak current	A	0.39				0.53			
Hold current	A	0.13				0.15			
Closed	W	2.9				3.4			
Operating times, typical ¹⁾									
• On	ms	<140				<140			
• Off	ms	<35				<30			



Type			3RA61	3RA62	3RA64	3RA65
Size			S0			
Number of poles			3			
Electromagnetic operating mechanism (continued)						
Switching capacity at 480 V		kA	30 (up to 12 A) 15 (8 ... 32 A)			
Switching capacity at 600 V		kA	10 (up to 12 A) 5 (8 ... 32 A)			
Line protection	At 10 kA	AWG	14			
	At 50 kA	AWG	12			
Shock resistance						
• Breaker mechanism OFF		g	25			
• Breaker mechanism ON		g	15			
Normal switching duty						
Making capacity			12 x I _n			
Breaking capacity			10 x I _n			
Switching capacity dependent on rated current	Up to 12 A Up to 32 A	HP HP	7 1/2 20			
Endurance in operating cycles						
• Electrical endurance	At I _e = 0.9 x I _n and 400 V		3 ... 10 000 000	2 x 3 ... 10 000 000	3 000 000	2 x 1 500 000
Control circuit						
Rated operational voltage						
• External auxiliary switch block		V	400/690			
• Internal auxiliary switch		V	400/690			
• Short-circuit signaling switch		V	400			
• Overload signaling switch		V	400			
Switching capacity						
• External auxiliary switch block						
	AC-15					
	• At U _e = 230 V	A	6			
	• At U _e = 400 V	A	3			
	• At U _e = 289/500 V	A	2			
	• At U _e = 400/690 V	A	1			
	DC-13					
	• At U _e = 24 V	A	6			
	• At U _e = 60 V	A	0.9			
	• At U _e = 125 V	A	0.55			
	• At U _e = 250 V	A	0.27			
• Internal auxiliary switch	AC-15					
	• At U _e = 230 V	A	6			
	• At U _e = 400 V	A	3			
	• At U _e = 289/500 V	A	2			
	• At U _e = 400/690 V	A	1			
	DC-13					
	• At U _e = 24 V	A	10			
	• At U _e = 60 V	A	2			
	• At U _e = 125 V	A	1			
	• At U _e = 250 V	A	0.27			
• Signaling switch	• At U _e = 480 V	A	0.1			
	AC-15					
	• At U _e = 230 V	A	3			
	• At U _e = 400 V	A	1			
	DC-13					
	• At U _e = 24 V	A	2			
	• At U _e = 250 V	A	0.11			

Compact Combination Starters

SIRIUS 3RA6 Compact Starters

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General data

Type			3RA61	3RA62	3RA64	3RA65
Size			S0			
Number of poles			3			
External auxiliary switch block, internal auxiliary switch						
Endurance in operating cycles						
• Mechanical endurance			10 000 000		3 000 000	
• Electrical endurance						
	AC-15, 230 V		200 000			
	• At 6 A		500 000			
	• At 3 A		2 000 000			
	• At 1 A		10 000 000			
	• At 0.3 A					
	DC-13, 24 V		300 00			
	• At 6 A		100 000			
	• At 3 A		2 000 000			
	• At 0.5 A		10 000 000			
	• At 0.2 A					
	DC-13, 110 V		40 000			
	• At 1 A		100 000			
	• At 0.55 A		300 000			
	• At 0.3 A		2 000 000			
	• At 0.1 A		10 000 000			
	• At 0.04 A					
	DC-13, 220 V		110 000			
	• At 0.3 A		650 000			
	• At 0.1 A		2 000 000			
	• At 0.05 A		10 000 000			
	• At 0.018 A					
Contact stability	At 17 V and 5 mA	Operating cycles	1 incorrect switching operation per 100 000 000			
Short-circuit protection						
• Short-circuit current $I_K \leq 1.1$ kA		Fuse links operational class gG	A	10		
		- NEOZED Type 5SE				
		- DIAZED Type 5SB				
		- LV HRC Type 3NA				
• Short-circuit current $I_K < 400$ A		Miniature circuit breaker up to 230 V with C characteristic	A	10		
Signaling switches						
Endurance in operating cycles						
• Mechanical endurance			20000			
• Electrical endurance AC-15		At 230 V and 3 A	6050			
Contact stability	At 17 V and 5 mA	Operating cycles	1 incorrect switching operation per 100 000 000			
Short-circuit protection						
• Short-circuit current $I_K \leq 1.1$ kA		Fuse links operational class gG	A	6		
		- NEOZED Type 5SE				
		- DIAZED Type 5SB				
		- LV HRC Type 3NA				
• Short-circuit current $I_K < 400$ A		Miniature circuit breaker up to 230 V with C characteristic	A	6		
Overload (short-circuit current $I_K \leq 1.1$ kA)		Fuse links operational class gG	A	4		
		- NEOZED Type 5SE				
		- DIAZED Type 5SB				
		- LV HRC Type 3NA				



Technical data

Connection type		Screw connection		Spring-type connection	
Max. rated current I_{max}		12 A	32 A	12 A	32 A
Conductor cross-sections of main circuit terminals					
Tools		Posidrive size 2		(3.5 x 0.5) mm, 8WA2 803	
Prescribed tightening torque		NM		2 ... 2.5	
Minimum/maximum conductor cross-sections					
• Solid	mm ²	2 x (1.5 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
	mm ²	2 x (2.5 ... 6)	Max. 1 x 10	Max. 1 x 10	Max. 1 x 10
	mm ²	Max. 1 x 10			
• Finely stranded without ferrule	mm ²	--	--	2 x (1.5 ... 6)	2 x (2.5 ... 6)
• Finely stranded with ferrule	mm ²	2 x (1.5 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
	mm ²	2 x (2.5 ... 6)			
• AWG cables	AWG	2 x (16 ... 14)	2 x (14 ... 10)	2 x (16 ... 10)	2 x (14 ... 10)
	AWG	2 x (14 ... 10)	1 x 8	1 x 8	1 x 8
	AWG	1 x 8			

Connection type		Screw connection		Spring-type connection	
Conductor cross-sections of control circuit terminals					
Tools		Posidrive size 2		(3.0 x 0.5) mm, DIN ISO 2380-1A	
Prescribed tightening torque		NM		0.8 ... 1.2	
Minimum/maximum conductor cross-sections					
• Solid	mm ²	1 x (0.5 ... 4)		2 x (0.25 ... 1.5)	
	mm ²	2 x (0.5 ... 2.5)			
• Finely stranded without ferrule	mm ²	--		2 x (0.25 ... 1.5)	
• Finely stranded with ferrule	mm ²	1 x (0.5 ... 2.5)		2 x (0.25 ... 1.5)	
	mm ²	2 x (0.5 ... 1.5)			
• AWG cables	AWG	2 x (20 ... 14)		2 x (24 ... 16)	
Conductor cross-sections of the auxiliary switch for compact starters					
Order No.		3RA69 1.-1A		3RA69 1.-2A	
Tools		Posidrive size 2		(2.5 x 0.4) mm, 8WA2 807	
Prescribed tightening torque		NM		0.8 ... 1.2	
Conductor cross-sections					
• Solid	mm ²	2 x (0.5 ... 1.5)		2 x (0.25 ... 2.5)	
	mm ²	2 x (0.75 ... 2.5)			
	mm ²	2 x (1 ... 4)			
• Finely stranded without ferrule	mm ²	--		2 x (0.25 ... 2.5)	
• Finely stranded with ferrule	mm ²	2 x (0.5 ... 1.5)		2 x (0.25 ... 1.5)	
	mm ²	2 x (0.75 ... 2.5)			
• AWG cables	AWG	2 x (20 ... 16)		2 x (24 ... 14)	
	AWG	2 x (18 ... 14)			
	AWG	1 x 12			


Compact Combination Starters

SIRIUS 3RA6 Compact Starters

3RA6
up to 32A



Technical data

Order No.		3RA6970-3A, 3RA6970-3B, 3RA6970-3C, 3RA6970-3D, 3RA6970-3E	
General data of the AS-i add-on module			
Permissible ambient temperature			
• Storage	Acc. to IEC/EN 60721-3-1	°C	-25 ... +70
• Transport	Acc. to IEC/EN 60721-3-2	°C	-25 ... +70
Degree of protection		Acc. to IEC/EN 60947-1	IP20
EMC interference immunity		Acc. to EN 50295	
Conductor-related interference		BURST acc. to IEC/EN 61000-4-4	kV
Electrostatic discharge		Acc. to IEC/EN 61000-4-2	kV
Field-related interference		Acc. to IEC/EN 61000-4-3	V/m
Maximum pick-up current		mA	400
Maximum hold current		mA	200
Power consumption, max.		mA	30
IO code		7	
ID code		A	
ID2 code		E	
Order No.		3RA6970-3B, 3RA6970-3C, 3RA6970-3D, 3RA6970-3E	
Connection type		 Screw connection	
Conductor cross-sections of the AS-i add-on module			
Tools		Posidrive size 1	
Prescribed tightening torque		NM	0.5 ... 0.6
Conductor cross-sections			
• Solid	mm²	1 x (0.5 ... 2.5)	
	mm²	2 x (0.5 ... 1.0)	
• Finely stranded with ferrule	mm²	1 x (0.5 ... 2.5)	
	mm²	2 x (0.5 ... 1.0)	
• AWG cables	AWG	1 x (20 ... 12)	



Technical data

Type	3RA6.		
General data			
Max. rated operational current			
• Infeed with screw connection 0-2/0 AWG	A	100	
• Infeed with screw connection 4-2 AWG	A	63	
• Infeed with spring-type connection 10-3 AWG	A	63	
• Expansion plug	A	63	
Permissible ambient temperature			
• During operation	°C	-20 ... +60 (over +40 current reduction is required)	
- Permissible rated current at control cabinet inside temperature: +40 °C	%	100	
	%	80	
• During storage/transport	°C	-55 ... +80	
Relative air humidity		%	10 ... 90
Installation altitude		m	Up to 2000 above sea level without restriction
Rated operational voltage U_e		V	690 AC
Rated frequency		Hz	50/60
Shock resistance		$a = 60 \text{ m/s}^2 = 6g$ with 10 ms; for every 3 shocks in all axes	
Vibratory load		$f = 1 \dots 6 \text{ Hz}$; $d = 15 \text{ mm}$ 10 cycles $f = 150 \text{ Hz}$; $a = 2 g$	
Degree of protection		Acc. to IEC 60947-1	IP20 (IP 00 terminal compartment)
Touch protection		Acc. to EN 50274	Finger-safe
Degree of pollution		3	
Short-circuit protection for infeed with screw connection 4-2 AWG and infeed with screw connection 0-2/0 AWG			Recommendation for upstream short-circuit protection device 3RV1041-4JA10 3RV1041-4MA10
	$I_{d,max}$	kA	< 21
	I^2t	kA²s	530
Short-circuit protection for infeed with spring-type connection			Recommendation for upstream short-circuit protection device 3RV2021-4DA10
• Conductor cross-section 12 AWG	$I_{d,max}$	kA	< 9.5
	I^2t	kA²s	85
• Conductor cross-section 10 AWG	$I_{d,max}$	kA	< 12.5
	I^2t	kA²s	140
• Conductor cross-section 8 AWG	$I_{d,max}$	kA	< 15
	I^2t	kA²s	180
• Conductor cross-section 6-4 AWG	$I_{d,max}$	kA	< 19
	I^2t	kA²s	440
Short-circuit protection for terminal block			Recommendation for upstream short-circuit protection device 5SY... 1)
• Conductor cross-section 16 AWG	$I_{d,max}$	kA	7.5
• Conductor cross-section 14 AWG	$I_{d,max}$	kA	9.5
• Conductor cross-section 12 AWG	$I_{d,max}$	kA	9.5
• Conductor cross-section 10 AWG	$I_{d,max}$	kA	12.5

¹⁾ To prevent the possibility of short-circuits, the cables on the terminal block must be installed so that they are short-circuit resistant according to EN 60439-1 Section 7.5.5.1.2.

Type	3RV29.		
Connection type	<div><div><div></div><div></div></div><div>Spring-type connection</div></div>		
Conductor cross-sections of terminal block			
Order No.	3RV29 17-5D		
Conductor cross-sections			
• Solid	mm ²	1.5 ... 6	
• Finely stranded with ferrule	mm ²	1.5 ... 4	
• Finely stranded without ferrule	mm ²	1.5 ... 6	
• AWG cables, solid or stranded	AWG	15 ... 10	












Compact Combination Starters

SIRIUS 3RA6 Compact Starters

Infeed systems for 3RA6
up to 100 A



Technical data

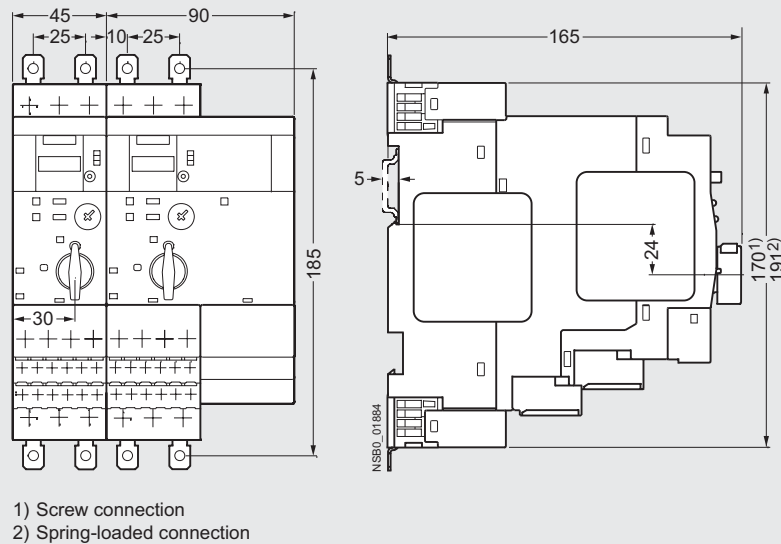
Type	3RA6.				
Connection type	 Screw connection				
Conductor cross-sections of infeed with screw connection 16-2 AWG (L1, L2, L3) ¹⁾ and PE infeed 2 AWG ²⁾					
Order No.	3RA68 12-8AB, 3RA68 12-8AC, 3RA68 60-6AB				
Tools	Posidrive size 2				
Specified tightening torque	NM	3 ... 4.5			
					
Conductor cross-sections					
• Solid	mm ²	2.6 ... 16	2.6 ... 16	max. 2 x 16	
• Stranded	mm ²	2.5 ... 35	2.5 ... 35	max. 2 x 25	
• Finely stranded with ferrule	mm ²	2.5 ... 25	2.5 ... 25	max. 2 x 16	
• Finely stranded without ferrule	mm ²	2.5 ... 25	2.5 ... 25	max. 2 x 16	
• AWG cables	AWG	12 ... 2	12 ... 2	max. 2 x (16 ... 2)	
Connection type	 Screw connection				
Conductor cross-sections of infeed with screw connection 10-2/0 AWG (L1, L2, L3) ¹⁾					
Order No.	3RA68 13-8AB, 3RA68 13-8AC				
Tools	SW	4			
Specified tightening torque	NM	6 ... 8			
					
Conductor cross-sections					
• Solid	mm ²	2.5 ... 16	2.5 ... 16	max. 2 x 16	
• Stranded	mm ²	4 ... 70	10 ... 70	max. 2 x 50	
• Finely stranded with ferrule	mm ²	2.5 ... 35	2.5 ... 50	max. 2 x 35	
• Finely stranded without ferrule	mm ²	4 ... 50	10 ... 50	max. 2 x 35	
• AWG cables	AWG	10 ... 2/0	10 ... 2/0	max. 2 x (10 ... 1/0)	
Connection type	 Spring-type connection				
Conductor cross-sections of infeed with spring-type connection 10-3 AWG (L1, L2, L3) ¹⁾ and PE infeed 3 AWG					
Order No.	3RA68 30-5AC, 3RA68 60-5AC				
Tools	8WA2 806 mm	5.5 x 0.8			
Conductor cross-sections					
• Solid	mm ²	4 ... 16			
• Stranded	mm ²	4 ... 35			
• Finely stranded with ferrule	mm ²	4 ... 25			
• Finely stranded without ferrule	mm ²	6 ... 25			
• AWG cables	AWG	10 ... 3			
Connection type	 Screw connection  Spring-type connection				
Conductor cross-sections of infeed with screw connection 4-2 AWG (T1, T2, T3) ²⁾ , infeed with screw connection 0-2/0 AWG (T1, T2, T3) ²⁾ 2-socket and 3-socket expansion modules (T1, T2, T3) ²⁾ and PE tap-off 10-8 AWG					
Order No.	3RA68 12-8AB, 3RA68 13-8AB, 3RA68 22-0AB, 3RA68 23-0AB, 3RA68 70-4AB		3RA68 12-8AC, 3RA68 13-8AC, 3RA68 22-0AC, 3RA68 23-0AC, 3RA68 70-3AC		
Tools	Posidrive size 2		(3.5 x 0.5) mm, 8WA2 803		
Specified tightening torque	NM	2 ... 2.5		--	
Maximum rated current	A	12	32	12	32
Conductor cross-sections					
• Solid	mm ²	2 x (1 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
	mm ²	2 x (2.5 ... 6)	max. 1 x 10	max. 1 x 10	max. 1 x 10
	mm ²	max. 1 x 10	max. 1 x 10	max. 1 x 10	max. 1 x 10
• Finely stranded with ferrule	mm ²	--	--	2 x (1.5 ... 6)	2 x (2.5 ... 6)
• Finely stranded without ferrule	mm ²	2 x (1 ... 2.5)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
	mm ²	2 x (2.5 ... 6)	2 x (2.5 ... 6)	2 x (1.5 ... 6)	2 x (2.5 ... 6)
• AWG cables	AWG	2 x (16 ... 14)	2 x (14 ... 10)	2 x (16 ... 10)	2 x (14 ... 10)
	AWG	2 x (14 ... 10)	2 x (14 ... 10)	2 x (16 ... 10)	2 x (14 ... 10)
	AWG	1 x 8	1 x 8	1 x 8	1 x 8

¹⁾ L1, L2, L3 main conductors on input side.

²⁾ T1, T2, T3 main conductors on output side.

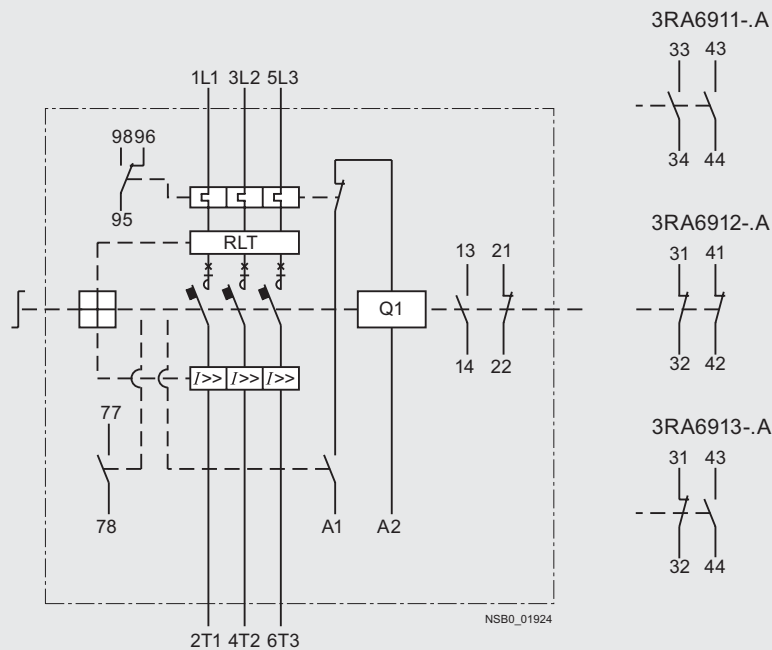
Dimensional drawings

Direct-on-line starters and reversing starters



Schematics

3RA61 direct-on-line starters



Schematic for 3RA61 direct-on-line starters (main circuit)

Compact Combination Starters

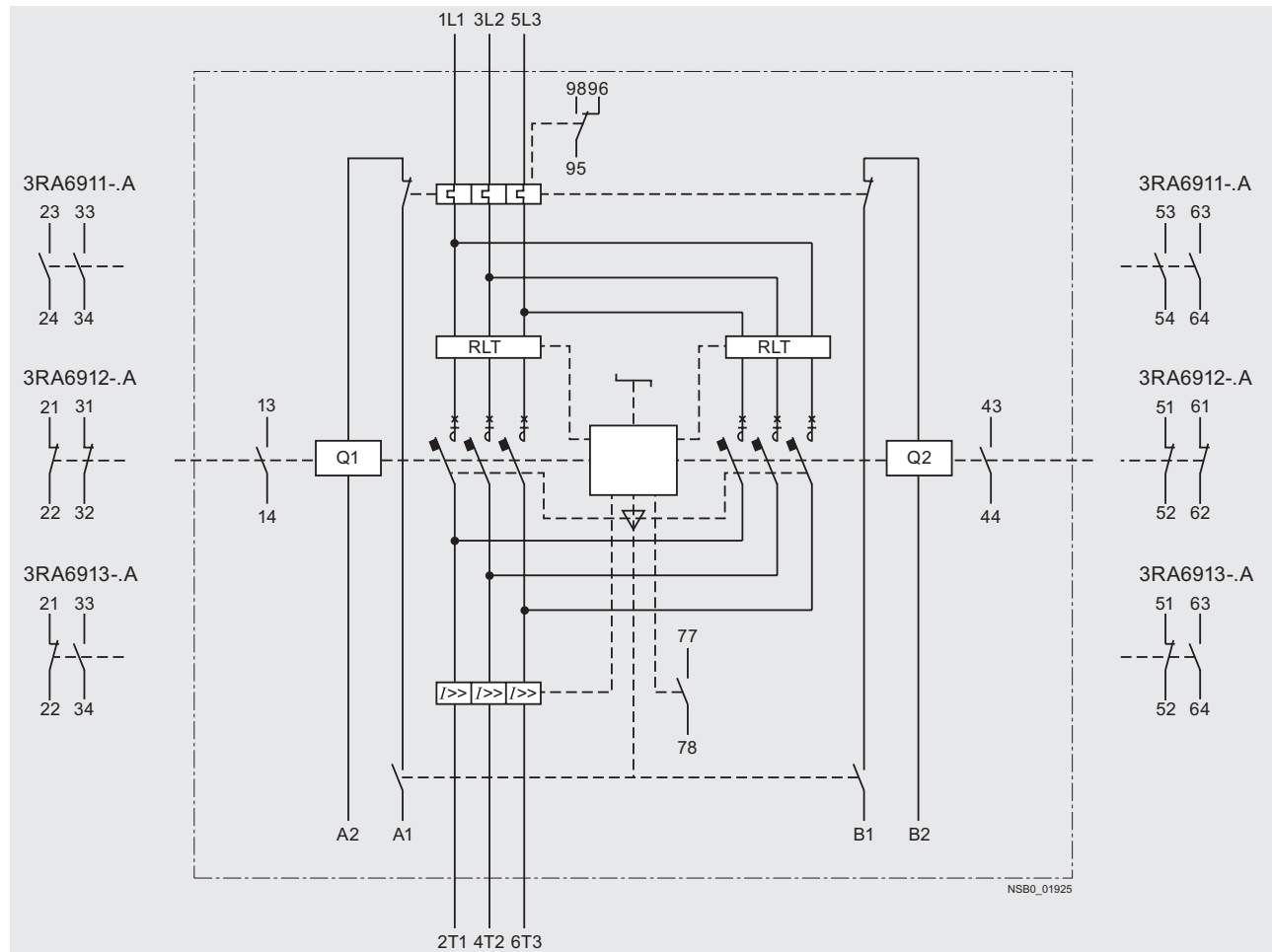
SIRIUS 3RA6 Compact Starters

3RA6
up to 32 A



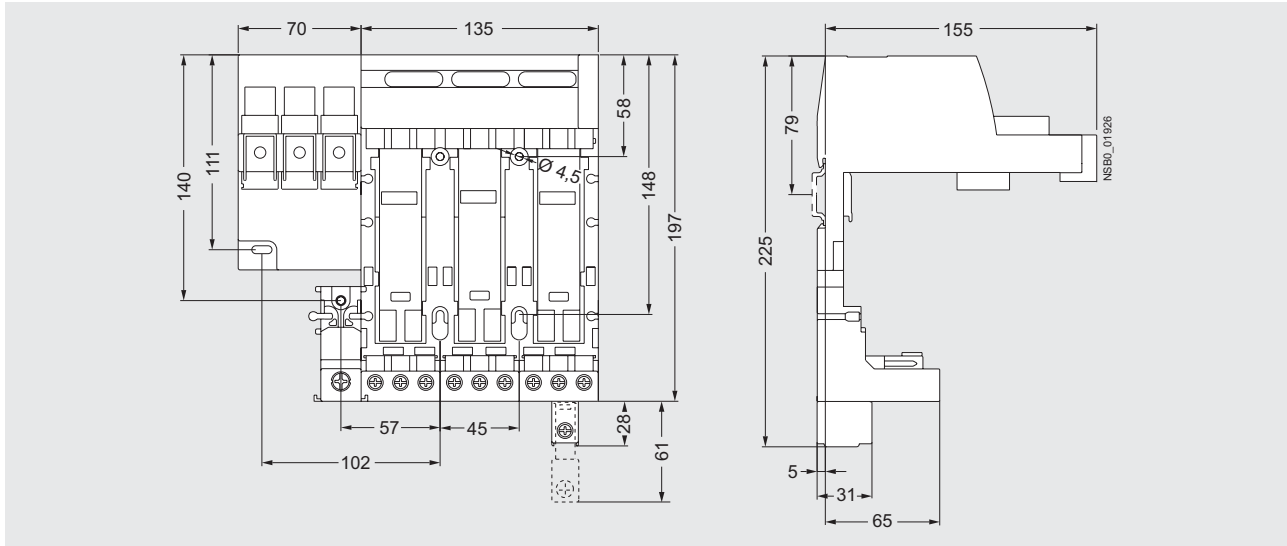
Dimensional drawings

3RA62 reversing starters

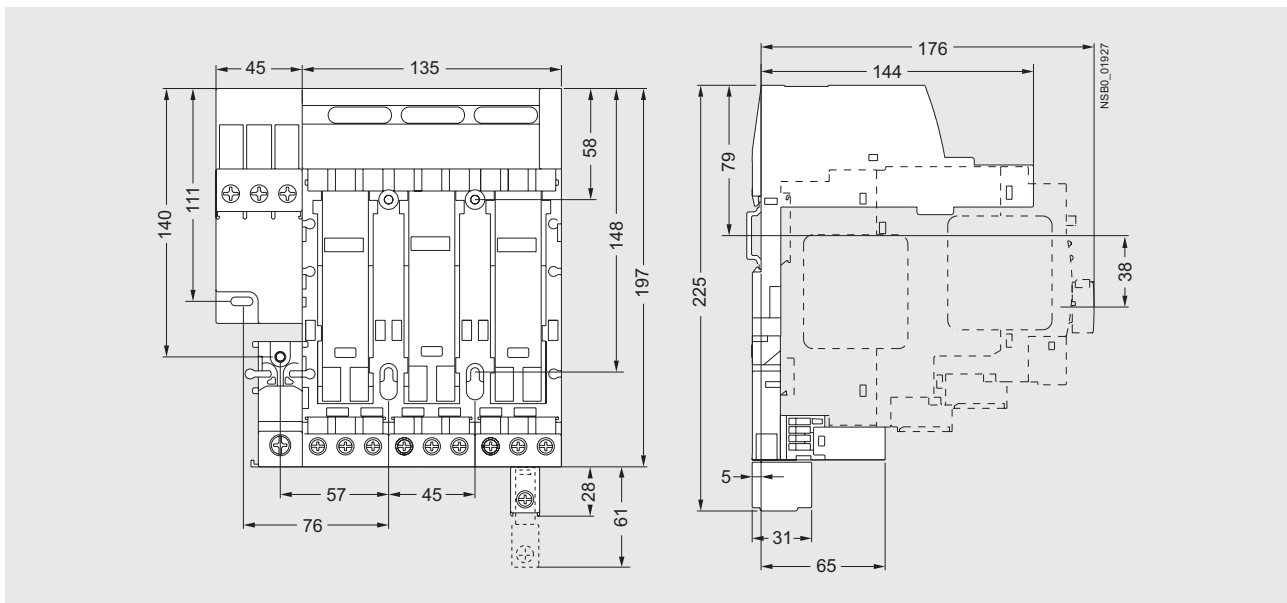


Schematic for 3RA62 reversing starters (main circuit)

Dimensional drawings



Infeed with screw connection 0-2/0 AWG on left with fixed 3-socket expansion module with outgoing screw terminals

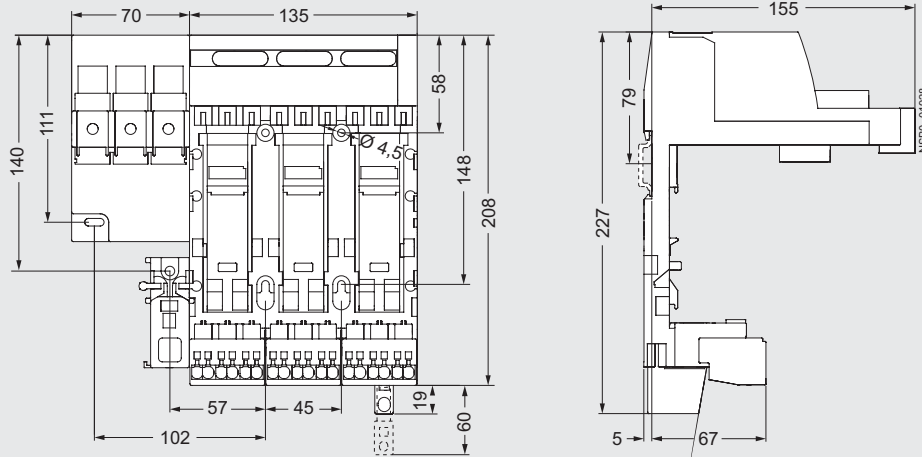


Infeed with screw connection 4-2 AWG on left with fixed 3-socket expansion module with outgoing screw terminals

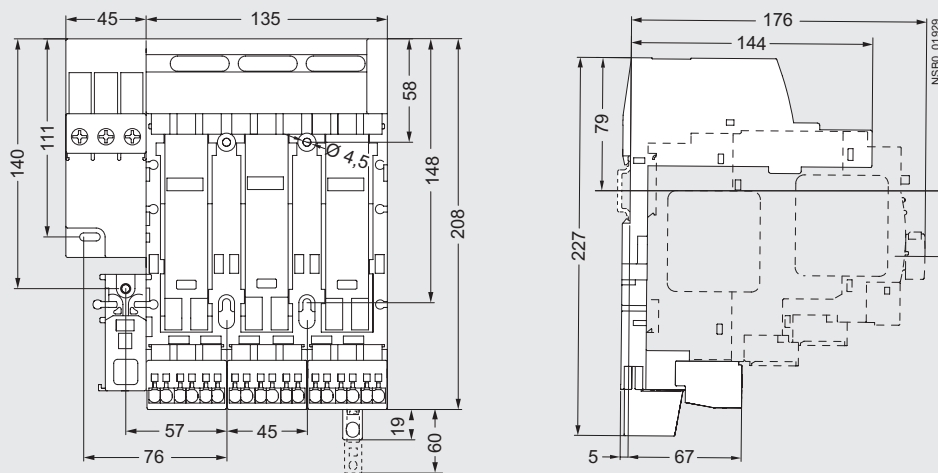
Compact Combination Starters

SIRIUS 3RA6 Compact Starters

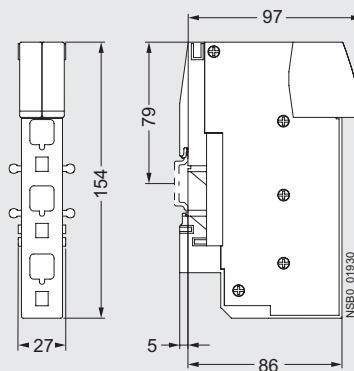
Infeed systems for 3RA6
up to 100 A



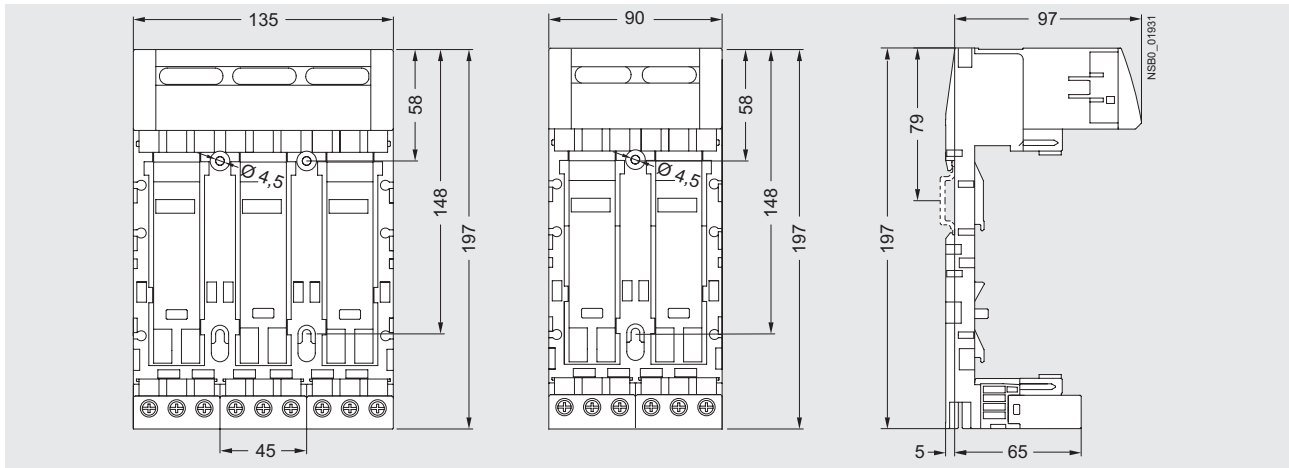
Infeed with screw connection 0-2/0 AWG on left with fixed 3-socket expansion module with outgoing spring-type terminals



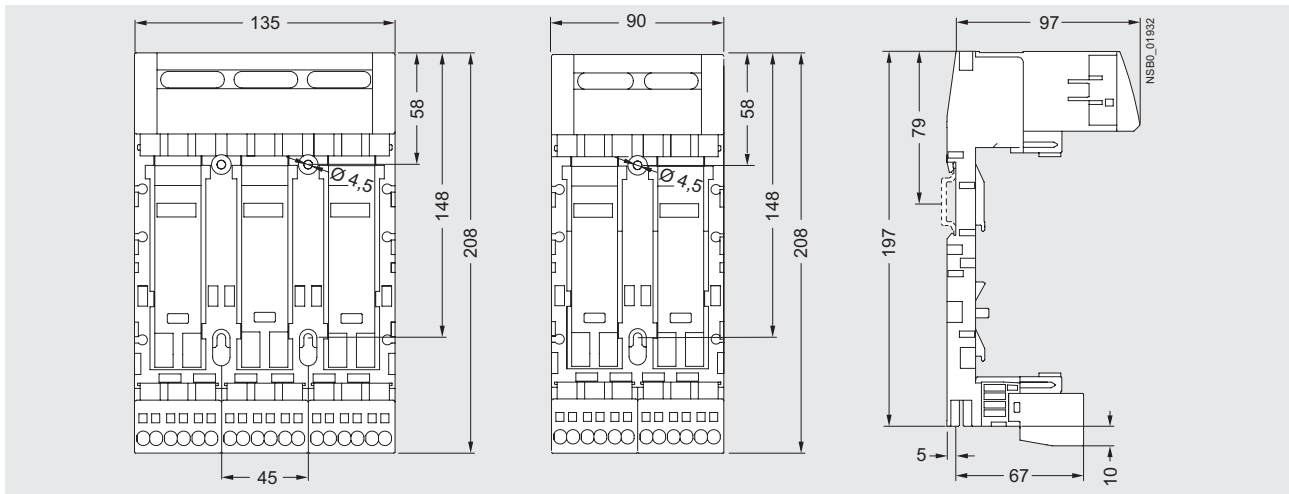
Infeed with screw connection 4-2 AWG on left with fixed 3-socket expansion module with outgoing spring-type terminals



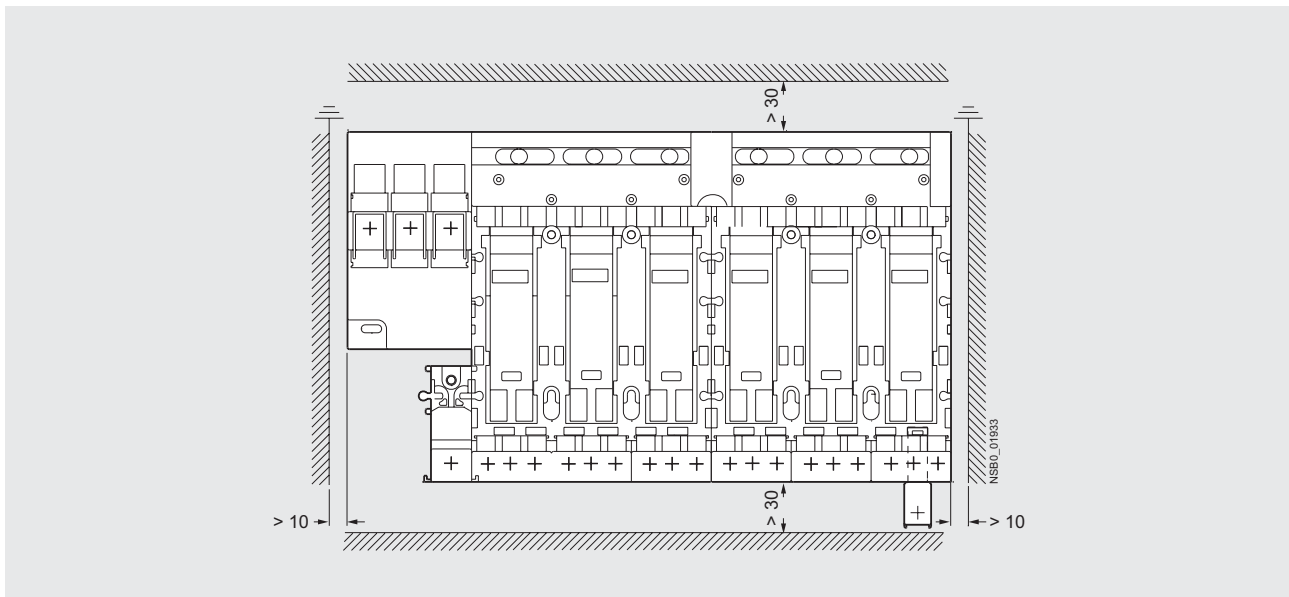
Infeed with spring-type terminals



3-socket expansion module and 2-socket expansion module with outgoing screw terminals



3-socket expansion module and 2-socket expansion module with outgoing spring-type terminals



Minimum clearances to adjacent components when using infeed system for 3RA6

Combination Starters & Starters for Group Installation

3RA1 / 3RA2 Starters

Non-Reversing, AC Coil
up to 22 A

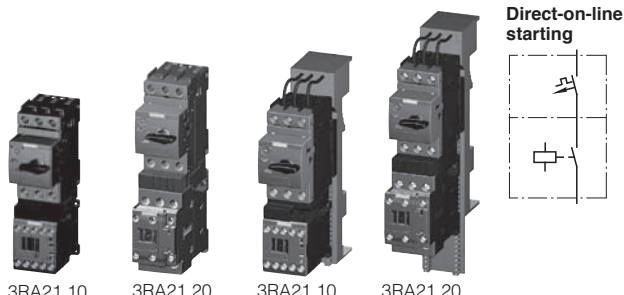
• Revised •

08/22/16

SIRIUS



Selection and ordering data




Rated control supply voltage 50/60 Hz 110/120 V AC
With screw connections

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches¹⁾ on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
 - Contactor size S00: 1 NO;
 - Contactor size S0: 1 NO + 1 NC

Combination Starter, UL508 Type F

All size S00 and S0 devices can be applied as Combination Starters with the addition of either of these line side connectors: 3RV29 28-1H, 3RV29 25-5EB or 3RV29 28-1K.

Size	UL Data							FLA setting range inverse-time delayed overload release	Consisting of the following single devices			Assembled starter		Weight approx.
	Single-phase HP ratings		Three-phase ²⁾ HP ratings			SCCR at 480 V	Motor starter protector		+ Contactor	+ Link module + Busbar adapter ³⁾	Screw terminals			
	115 V	230 V	200 V	230 V	460 V	575 V	kA		A			Order No.		

Selection depends on motor full load amps

									3RV20	3RT20	3RA		
S00	--	--	--	--	--	--	65	0.11...0.16	11-0AA10	15-1AK61	1921-1DA00	3RA21 1□-0A□15-1AK6	0.575
	--	--	--	--	--	--	65	0.14...0.2	11-0BA10		+ 8US1251-5DS10	3RA21 1□-0B□15-1AK6	0.575
	--	--	--	--	--	--	65	0.18...0.25	11-0CA10			3RA21 1□-0C□15-1AK6	0.575
	--	--	--	--	--	--	65	0.22...0.32	11-0DA10			3RA21 1□-0D□15-1AK6	0.575
	--	--	--	--	--	--	65	0.28...0.4	11-0EA10			3RA21 1□-0E□15-1AK6	0.575
	--	--	--	--	--	--	65	0.35...0.5	11-0FA10			3RA21 1□-0F□15-1AK6	0.575
	--	--	--	--	--	--	65	0.45...0.63	11-0GA10			3RA21 1□-0G□15-1AK6	0.575
	--	--	--	--	--	--	65	0.55...0.8	11-0HA10			3RA21 1□-0H□15-1AK6	0.575
	--	--	--	--	1/2	65	0.7... 1	11-0JA10				3RA21 1□-0J□15-1AK6	0.575
	--	--	--	1/2	1/2	65	0.9... 1.25	11-0KA10				3RA21 1□-0K□15-1AK6	0.575
	--	1/10	--	3/4	3/4	65	1.1... 1.6	11-1AA10				3RA21 1□-1A□15-1AK6	0.575
	--	1/8	--	3/4	1	65	1.4... 2	11-1BA10				3RA21 1□-1B□15-1AK6	0.575
	--	1/6	1/2	1/2	1	1 1/2	65	1.8... 2.5	11-1CA10			3RA21 1□-1C□15-1AK6	0.575
	1/10	1/4	1/2	3/4	1 1/2	2	65	2.2... 3.2	11-1DA10			3RA21 1□-1D□15-1AK6	0.575
	1/8	1/3	3/4	3/4	2	3	65	2.8... 4	11-1EA10			3RA21 1□-1E□15-1AK6	0.575
	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10			3RA21 1□-1F□15-1AK6	0.575
S0	1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10			3RA21 1□-1G□15-1AK6	0.575
	1/3	1	2	2	5	5	65	5.5... 8	11-1HA10	16-1AK61		3RA21 1□-1H□16-1AK6	0.575
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			3RA21 1□-1J□16-1AK6	0.575
	1/2	2	3	3	7 1/2	10	65	9... 12	11-1KA10	17-1AK61		3RA21 1□-1K□17-1AK6	0.575
	1	2	3	5	10	--	65	11... 16	11-4AA10	18-1AK61		3RA21 1□-4A□18-1AK6	0.575
	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10	24-1AK60	2921-1AA00	3RA21 2□-1F□24-0AK6	0.761
	1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10		+ 8US1251-5NT10	3RA21 2□-1G□24-0AK6	0.761
	1/3	1	2	2	5	5	65	5.5... 8	11-1HA10			3RA21 2□-1H□24-0AK6	0.761
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			3RA21 2□-1J□24-0AK6	0.761
	1/2	2	3	3	7 1/2	10	65	9... 12.5	11-1KA10			3RA21 2□-1K□24-0AK6	0.761
	1	2	3	5	10	--	65	11... 16	21-4AA10	26-1AK60		3RA21 2□-4A□26-0AK6	0.761
	1 1/2	3	5	5	10	--	65	14... 20	21-4BA10			3RA21 2□-4B□26-0AK6	0.761
	1 1/2	3	5	7 1/2	15	--	50	17... 22	21-4CA10	27-1AK60		3RA21 2□-4C□27-0AK6	0.761
	2	3	5	7 1/2	15	--	50	20... 25	21-4DA10			3RA21 2□-4D□27-0AK6	0.761
	2	5	7 1/2	10	20	--	50	27... 32	21-4EA10			3RA21 2□-4E□27-0AK6	0.761

Order No. supplement for:

- Standard DIN rail or screw mounting with no additional auxiliaries
- Standard DIN rail or screw mounting with 1 SPDT NO/NC MSP auxiliary (S00 frame contactor has 1NO auxiliary and S0 frame contactor has 1NO/1NC auxiliary)

0
5

A
A

- With Fast Bus adaptor and no additional auxiliaries
- With Fast Bus adaptor and 1 SPDT NO/NC MSP auxiliary (S00 frame contactor has 1NO auxiliary and S0 frame contactor has 1NO/1NC auxiliary)

0
5

D
D

1) For auxiliary switches see Accessories page 4/44.

2) Selection depends on the motor full load amps.
HP ratings for reference only.

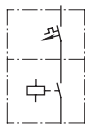
3) Used only for mounting starter on 8US Fast Bus busbar systems.

Selection and ordering data

3RA21 30



Direct-on-line starting




For 35 mm standard mounting rail or screw mounting

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches¹⁾ on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
 - Contactor size S2: 1NO & 1NC
 - Contactor size S3: no integrated auxiliaries

Combination Starter, UL508 Type F

- Size S2 devices can be applied as Combination Starters. For versions of 50A or higher, the addition of a 3RV2938-1K line side phase barrier is required.
- Size S3 devices can be applied as Combination Starters with the addition of a 3RT1946-4GA07 line side terminal kit

						SCCR at 480Y/277V kA	FLA setting range Inverse-time delayed overload release	Starter Order No.	Size	Consisting of the following individual devices				
Single-Phase HP Ratings		Three-Phase ²⁾ HP ratings								Motor starter protector	+ Contactor	+	Link module + Adapter for standard mounting rail ³⁾	
115V	230V	200V	230V	460V	575V		A							
110VAC 50Hz / 120VAC 60 Hz														
3	5	10	10	25	30	65	22... 32	3RA21 3□-4EA35-□AK6	S2	3RV20 31-4EA10	3RT2035-1AK60	3RT2036-1AK60	3RA2931-1AA00 + 3RA2932-1AA00 (must be ordered separately)	
3	7.5	15	15	30	40	65	28... 36	3RA21 3□-4PA35-□AK6		3RV20 31-4PA10				
3	7.5	15	15	30	40	65	32... 40	3RA21 3□-4UA35-□AK6		3RV20 31-4UA10				
3	10	15	15	40	50	65	35... 45	3RA21 3□-4VA36-□AK6		3RV20 31-4VA10	3RT2036-1AK60			
5	10	15	20	40	50	65	42... 52	3RA21 3□-4WA36-□AK6		3RV20 31-4WA10	3RT2036-1AK60			
5	15	20	25	50	50	20	49... 59	3RA21 3□-4XA37-□AK6		3RV20 31-4XA10	3RT2037-1AK60			
5	15	20	25	50	50	20	54... 65	3RA21 3□-4JA37-□AK6		3RV20 31-4JA10	3RT2037-1AK60			
3	7 1/2	15	15	30	40	65	28... 40	3RA11 4□-4FB44-□AK6	S3	3RV10 41-4FA10	3RT1044-1AK60	3RT1045-1AK60	3RA1941-1AA00 + 3RA1942-1AA00	
5	10	15	20	40	50	65	36... 50	3RA11 4□-4HB44-□AK6		3RV10 41-4HA10				
5	15	20	25	50	60	65	45... 63	3RA11 4□-4JB44-□AK6		3RV10 41-4JA10				
7 1/2	15	25	25	60	75	65	57... 75	3RA11 4□-4KB45-□AK6		3RV10 41-4KA10	3RT1046-1AK60			
10	20	30	30	75	—	65	70... 90	3RA11 4□-4LB46-□AK6		3RV10 41-4LA10	3RT1046-1AK60			
10	20	30	30	75	—	65	80... 100	3RA11 4□-4MB46-□AK6		3RV10 41-4MA10	3RT1046-1AK60			

24 VUC (S2) 24 VDC (S3)																	
3	5	10	10	25	30	65	22... 32	3RA21 3□-4EA35-□NB3	S2	3RV20 31-4EA10	3RT2035-1NB30	3RT2036-1NB30	3RT2037-1NB30	3RA2931-1AA00 + 3RA2932-1AA00 (must be ordered separately)			
3	7.5	15	15	30	40	65	28... 36	3RA21 3□-4PA35-□NB3		3RV20 31-4PA10							
3	7.5	15	15	30	40	65	32... 40	3RA21 3□-4UA35-□NB3		3RV20 31-4UA10							
3	10	15	15	40	50	65	35... 45	3RA21 3□-4VA36-□NB3		3RV20 31-4VA10							
5	10	15	20	40	50	65	42... 52	3RA21 3□-4WA36-□NB3		3RV20 31-4WA10							
5	15	20	25	50	60	20	49... 59	3RA21 3□-4XA37-□NB3		3RV20 31-4XA10							
5	15	20	25	50	60	20	54... 65	3RA21 3□-4JA37-□NB3		3RV20 31-4JA10							
3	7 1/2	15	15	30	40	65	28... 40	3RA11 4□-4FB44-□BB4	S3	3RV10 41-4FA10	3RT1044-1BB40	3RT1045-1BB40	3RT1046-1BB40	3RA1941-1BA00 + 3RA1942-1AA00			
5	10	15	20	40	50	65	36... 50	3RA11 4□-4HB44-□BB4		3RV10 41-4HA10							
5	15	20	25	50	60	65	45... 63	3RA11 4□-4JB44-□BB4		3RV10 41-4JA10							
7 1/2	15	25	25	60	75	65	57... 75	3RA11 4□-4KB45-□BB4		3RV10 41-4KA10							
10	20	30	30	75	-	65	70... 90	3RA11 4□-4LB46-□BB4		3RV10 41-4LA10							
10	20	30	30	75	-	65	80... 100	3RA11 4□-4MB46-□BB4		3RV10 41-4MA10							

Order No. supplement for:

- Standard DIN rail or screw mounting with no additional auxiliaries
- Standard DIN rail or screw mounting with 1 SPDT NO/NC MSP auxiliary (S2 frame contactor has 1NO/1NC integrated auxiliary) (S3 frame contactor has 1NO top mounted auxiliary)

0	0
5	0 (S2)
5	1 (S3)

- For auxiliary switches, see accessories page 4/44.
- Selection depends on motor full load amps. Horsepower ratings for reference only.
- Adapters for standard mounting rail are included for all S3 starters and optional to be ordered as accessories for S2 non-reversing starters.

Note:

In the S2 frame, for 100kA SCCR versions, replace the prefix 3RA213x with 3RA215x. Rating exceptions would be the 59A and 65A versions having a 30kA SCCR at 480Y/277V. For UL 508 type E/F, order 3RV2938-1K Phase Barrier for field installation on all versions.

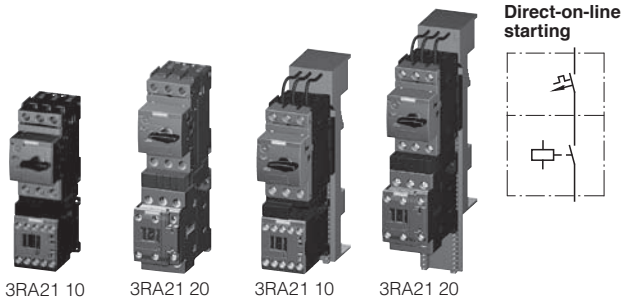
Combination Starters & Starters for Group Installation

3RA1 / 3RA2

Non-Reversing, DC Coil
up to 22 A

• Revised •
10/15/15

SIRIUS




Rated control supply voltage 24 V DC
With screw connections

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches¹⁾ on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
 - Contactor size S00: 1 NO;
 - Contactor size S0: 1 NO + 1 NC

Combination Starter, UL508 Type F

All size S00 and S0 devices can be applied as Combination Starters with the addition of either of these line side connectors: 3RV29 28-1H, 3RV29 25-5EB or 3RV29 28-1K.

Size	UL Data						FLA setting range inverse-time delayed overload release	Consisting of the following single devices			Assembled starter		Weight approx.		
	Single-phase HP ratings		Three-phase ²⁾ HP ratings		SCCR at 480 V	Motor starter protector		+ Contactor	+ Link module + Busbar adapter ³⁾	Screw terminals					
	115 V	230 V	200 V	230 V						460 V		575 V		Order No.	kg
Selection depends on motor full load amps															
											3RV20	3RT20	3RA		
S00	--	--	--	--	--	--	65	0.11...0.16	11-0AA10	15-1BB41	1921-1DA00	3RA21 1□-0A□15-1BB4	0.630		
	--	--	--	--	--	--	65	0.14...0.2	11-0BA10		+ 8US1251-5DS10	3RA21 1□-0B□15-1BB4	0.630		
	--	--	--	--	--	--	65	0.18...0.25	11-0CA10			3RA21 1□-0C□15-1BB4	0.630		
	--	--	--	--	--	--	65	0.22...0.32	11-0DA10			3RA21 1□-0D□15-1BB4	0.630		
	--	--	--	--	--	--	65	0.28...0.4	11-0EA10			3RA21 1□-0E□15-1BB4	0.630		
	--	--	--	--	--	--	65	0.35...0.5	11-0FA10			3RA21 1□-0F□15-1BB4	0.630		
	--	--	--	--	--	--	65	0.45...0.63	11-0GA10			3RA21 1□-0G□15-1BB4	0.630		
	--	--	--	--	--	--	65	0.55...0.8	11-0HA10			3RA21 1□-0H□15-1BB4	0.630		
	--	--	--	--	--	1/2	65	0.7... 1	11-0JA10			3RA21 1□-0J□15-1BB4	0.630		
	--	--	--	--	1/2	1/2	65	0.9... 1.25	11-0KA10			3RA21 1□-0K□15-1BB4	0.630		
	--	1/10	--	--	3/4	3/4	65	1.1... 1.6	11-1AA10			3RA21 1□-1A□15-1BB4	0.630		
	--	1/8	--	--	3/4	1	65	1.4... 2	11-1BA10			3RA21 1□-1B□15-1BB4	0.630		
	--	1/6	1/2	1/2	1	1 1/2	65	1.8... 2.5	11-1CA10			3RA21 1□-1C□15-1BB4	0.630		
	1/10	1/4	1/2	3/4	1 1/2	2	65	2.2... 3.2	11-1DA10			3RA21 1□-1D□15-1BB4	0.630		
	1/8	1/3	3/4	3/4	2	3	65	2.8... 4	11-1EA10			3RA21 1□-1E□15-1BB4	0.630		
	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10			3RA21 1□-1F□15-1BB4	0.630		
	1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10			3RA21 1□-1G□15-1BB4	0.630		
	1/3	1	2	2	5	5	65	5.5... 8	11-1HA10	16-1BB41		3RA21 1□-1H□16-1BB4	0.630		
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			3RA21 1□-1J□16-1BB4	0.630		
	1/2	2	3	3	7 1/2	10	65	9... 12	11-1KA10	17-1BB41		3RA21 1□-1K□17-1BB4	0.630		
	1	2	3	5	10	--	65	11...16	11-4AA10	18-1BB41		3RA21 1□-4A□18-1BB4	0.630		
S0	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10	24-1BB40	2921-1BA00	3RA21 2□-1F□24-0BB4	0.948		
	1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10		+ 8US1251-5NT10	3RA21 2□-1G□24-0BB4	0.948		
	1/3	1	2	2	5	5	65	5.5... 8	11-1HA10			3RA21 2□-1H□24-0BB4	0.948		
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			3RA21 2□-1J□24-0BB4	0.948		
	1/2	2	3	3	7 1/2	10	65	9... 12.5	11-1KA10			3RA21 2□-1K□24-0BB4	0.948		
	1	2	3	5	10	--	65	11... 16	21-4AA10	26-1BB40		3RA21 2□-4A□26-0BB4	0.948		
	1 1/2	3	5	5	10	--	65	14... 20	21-4BA10			3RA21 2□-4B□26-0BB4	0.948		
	1 1/2	3	5	7 1/2	15	--	50	17... 22	21-4CA10	27-1BB40		3RA21 2□-4C□27-0BB4	0.948		
	2	3	5	7 1/2	15	--	50	20... 25	21-4DA10			3RA21 2□-4D□27-0BB4	0.948		
	2	5	7 1/2	10	20	--	50	27... 32	21-4EA10			3RA21 2□-4E□27-0BB4	0.948		

Order No. supplement for:

- Standard DIN rail or screw mounting with no additional auxiliaries
- Standard DIN rail or screw mounting with 1 SPDT NO/NC MSP auxiliary (S00 frame contactor has 1NO auxiliary and S0 frame contactor has 1NO/1NC auxiliary)

- With Fast Bus adaptor and no additional auxiliaries
- With Fast Bus adaptor and 1 SPDT NO/NC MSP auxiliary (S00 frame contactor has 1NO auxiliary and S0 frame contactor has 1NO/1NC auxiliary)

0	A
5	A
0	D
5	D

1) For auxiliary switches, see Accessories page 4/44.

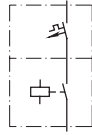
2) Selection depends on the concrete motor full load amps. HP ratings for reference only.

3) Use only for mounting starter on 8US Fast Bus busbar systems.

Selection and ordering data



Direct-on-line starting




For 60mm Fast Bus busbar systems

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches¹⁾ on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
 - Contactor size S2: 1NO & 1NC
 - Contactor size S3: no integrated auxiliaries

Combination Starter, UL508 Type F

- Size S2 devices can be applied as Combination Starters. For versions of 50A or higher, the addition of a 3RV2938-1K line side phase barrier is required.
- Size S3 devices can be applied as Combination Starters with the addition of a 3RT1946-4GA07 line side terminal kit

						SCCR at 480Y/ 277V kA		FLA setting range Inverse-time delayed overload release  A		Starter Order No.	Size	Consisting of the following individual devices					
Single-Phase HP Ratings		Three-Phase ²⁾ HP ratings										Motor starter protector	+ Contactor	+ Link module +	Adapter for standard mounting rail ³⁾		
115V	230V	200V	230V	460V	575V												
110VAC 50Hz / 120 VAC 60Hz																	
3	5	10	10	25	30	65	22... 32	3RA21 3□-4ED35-□AK6	S2	3RV20 31-4EA10	3RT2035-1AK60	3RA2931-1AA00 + 8US1261-6MT10					
3	7.5	15	15	30	40	65	28... 36	3RA21 3□-4PD35-□AK6		3RV20 31-4PA10							
3	7.5	15	15	30	40	65	32... 40	3RA21 3□-4UD35-□AK6		3RV20 31-4UA10							
3	10	15	15	40	50	65	35... 45	3RA21 3□-4VD36-□AK6		3RV20 31-4VA10	3RT2036-1AK60						
5	10	15	20	40	50	65	42... 52	3RA21 3□-4WD36-□AK6		3RV20 31-4WA10	3RT2036-1AK60						
5	15	20	25	50	50	20	49... 59	3RA21 3□-4XD37-□AK6		3RV20 31-4XA10	3RT2037-1AK60						
5	15	20	25	50	50	20	54... 65	3RA21 3□-4JA10-□AK6		3RV20 31-4JA10	3RT2037-1AK60						
3	7 1/2	15	15	30	40	65	28... 40	3RA11 4□-4FD44-□AK6	S3	3RV10 41-4FA10	3RT1044-1AK60	3RA1941-1AA00 + 8US1211-4TR00					
5	10	15	20	40	50	65	36... 50	3RA11 4□-4HD44-□AK6		3RV10 41-4HA10							
5	15	20	25	50	60	65	45... 63	3RA11 4□-4JD44-□AK6		3RV10 41-4JA10							
7 1/2	15	25	25	60	75	65	57... 75	3RA11 4□-4KD45-□AK6		3RV10 41-4KA10	3RT1045-1AK60						
10	20	30	30	75	-	65	70... 90	3RA11 4□-4LD46-□AK6		3RV10 41-4LA10	3RT1046-1AK60						
10	20	30	30	75	-	65	80...100	3RA11 4□-4MD46-□AK6		3RV10 41-4MA10	3RT1046-1AK60						
24VDC																	
3	5	10	10	25	30	65	22... 32	3RA21 3□-4ED35-□NB3	S2	3RV20 31-4EA10	3RT2035-1NB30	3RA2931-1AA00 + 8US1261-6MT10					
3	7.5	15	15	30	40	65	28... 36	3RA21 3□-4PD35-□NB3		3RV20 31-4PA10							
3	7.5	15	15	30	40	65	32... 40	3RA21 3□-4UD35-□NB3		3RV20 31-4UA10							
3	10	15	15	40	50	65	35... 45	3RA21 3□-4VD36-□NB3		3RV20 31-4VA10	3RT2036-1NB30						
5	10	15	20	40	50	65	42... 52	3RA21 3□-4WD36-□NB3		3RV20 31-4WA10	3RT2036-1NB30						
5	15	20	25	50	50	20	49... 59	3RA21 3□-4XD37-□NB3		3RV20 31-4XA10	3RT2037-1NB30						
5	15	20	25	50	60	20	54... 65	3RA21 3□-4JD37-□NB3		3RV20 31-4JA10	3RT2037-1NB30						
3	7 1/2	15	15	30	40	65	28... 40	3RA11 4□-4FD44-□BB4	S3	3RV10 41-4FA10	3RT1044-1BB40	3RA1941-1BA00 + 8US1211-4TR00					
5	10	15	20	40	50	65	36... 50	3RA11 4□-4HD44-□BB4		3RV10 41-4HA10							
5	15	20	25	50	60	65	45... 63	3RA11 4□-4JD44-□BB4		3RV10 41-4JA10							
7 1/2	15	25	25	60	75	65	57... 75	3RA11 4□-4KD45-□BB4		3RV10 41-4KA10	3RT1045-1BB40						
10	20	30	30	75	-	65	70... 90	3RA11 4□-4LD46-□BB4		3RV10 41-4LA10	3RT1046-1BB40						
10	20	30	30	75	-	65	80...100	3RA11 4□-4MD46-□BB4		3RV10 41-4MA10	3RT1046-1BB40						

Order No. supplement for:

- Standard DIN rail or screw mounting with no additional auxiliaries
- Standard DIN rail or screw mounting with 1 SPDT NO/NC MSP auxiliary (S2 frame contactor has 1NO/1NC integrated auxiliary) (S3 frame contactor has 1NO top mounted auxiliary)

0	0
5	0 (S2)
5	1 (S3)

1) For auxiliary switches, see Accessories page 4/44.

2) Selection depends on motor full load amps.
Horsepower ratings for reference only.

Note:

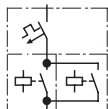
In the S2 frame, for 100kA SCCR versions, replace the prefix 3RA213x with 3RA215x. Rating exceptions would be the 59A and 65A versions having a 30kA SCCR at 480Y/277V. For UL 508 type E/F, order 3RV2938-1K Phase Barrier for field installation on all versions.

Selection and ordering data

3RA12 40



Reversing duty




For 35 mm standard mounting rail or screw mounting

- All starters are suitable for use in Group Installation applications per NEC 430-53 (c)
- Motor starter protector and contactor are linked electrically and mechanically by means of a link module and adapter plate
- Starter includes both electrical and mechanical interlocks
- Auxiliary switches ¹⁾ can be added easily to the MSP and the contactor

Combination Starter, UL508 Type F

- Size S2 devices can be applied as Combination Starters. For versions of 50A or higher, the addition of a 3RV2938-1K line side phase barrier is required.
- Size S3 devices can be applied as Combination Starters with the addition of a 3RT1946-4GA07 line side terminal kit
- SCCR: 65kA at 480V

							FLA setting range Inverse-time delayed overload	Starter Order No.	Size	Consisting of the following individual devices			
Single-Phase HP Ratings		Three-Phase ²⁾ HP ratings								Motor starter protector	+ 2 Contactors +	Link module + assembly kit RH ³⁾	
115V	230V	200V	230V	460V	575V	A							
110VAC 50Hz / 120VAC 60Hz													
3	5	10	10	25	30	22... 32	For customer assembly		S2	3RV20 31-4EA10	3RT2035-1AK60	3RA2931-1AA00 + 3RA2933-1BB1	
3	7.5	15	15	30	40	28... 36			3RV20 31-4PA10				
3	7.5	15	15	30	40	32... 40			3RV20 31-4UA10				
3	10	15	15	40	50	35... 45			3RV20 31-4VA10	3RT2036-1AK60			
5	10	15	20	40	50	42... 52			3RV20 31-4WA10	3RT2036-1AK60			
5	15	20	25	50	50	49... 59			3RV20 31-4XA10	3RT2037-1AK60			
5	15	20	25	50	50	54... 65			3RV20 31-4JA10	3RT2037-1AK60			
3	7 1/2	15	15	30	40	28 ... 40			3RA12 4□-4FB44-□AK6	S3	3RV10 41-4FA10	3RT1044-1AK60	3RA1941-1AA00 + 3RA1943-1B ⁴⁾
5	10	15	20	40	50	36 ... 50			3RA12 4□-4HB44-□AK6	3RV10 41-4HA10			
5	15	20	25	50	60	45 ... 63			3RA12 4□-4JB44-□AK6	3RV10 41-4JA10			
7 1/2	15	25	25	60	75	57 ... 75			3RA12 4□-4KB45-□AK6	3RV10 41-4KA10	3RT1045-1AK60		
10	20	30	30	75	—	70 ... 90			3RA12 4□-4LB46-□AK6	3RV10 41-4LA10	3RT1046-1AK60		
10	20	30	30	75	—	80 ... 100			3RA12 4□-4MB46-□AK6	3RV10 41-4MA10	3RT1046-1AK60		

24VDC							For customer assembly	S2				
3	5	10	10	25	30	22... 32			3RV20 31-4EA10	3RT2035-1NB30	3RA2931-1AA00 + 3RA2933-1BB1	
3	7.5	15	15	30	40	28... 36			3RV20 31-4PA10			
3	7.5	15	15	30	40	32... 40			3RV20 31-4UA10			
3	10	15	15	40	50	35... 45			3RV20 31-4VA10	3RT2036-1NB30		
5	10	15	20	40	50	42... 52			3RV20 31-4WA10	3RT2036-1NB30		
5	15	20	25	50	50	49... 59			3RV20 31-4XA10	3RT2037-1NB30		
5	15	20	25	50	50	54... 65		3RV20 31-4JA10	3RT2037-1NB30			
3	7 1/2	15	15	30	40	28 ... 40		S3	3RV10 41-4FA10	3RT1044-1BB40	3RA1941-1BA00 + 3RA1943-1B ⁴⁾	
5	10	15	20	40	50	36 ... 50			3RV10 41-4HA10			
5	15	20	25	50	60	45 ... 63			3RV10 41-4JA10			
7 1/2	15	25	25	60	75	57 ... 75			3RV10 41-4KA10	3RT1045-1BB40		
10	20	30	30	75	—	70 ... 90			3RV10 41-4LA10	3RT1046-1BB40		
10	20	30	30	75	—	80 ... 100			3RV10 41-4MA10	3RT1046-1BB40		

Order No. suffix
Standard unit without auxiliary contacts.

0

0

1 SPDT NO/NC MSP auxiliary and 1 NO
front mount contactor auxiliary.

5

1

RH = Reversing duty for rail mounting.

- 1) For auxiliary switches, see [Accessories page 4/44](#).
- 2) Selection depends on motor full load amps. Horse power ratings for reference only.
- 3) Adapters for standard mounting rail are also suitable for screw mounting.
- 4) Mechanical interlock must be ordered separately; see [Accessories page 4/50](#)

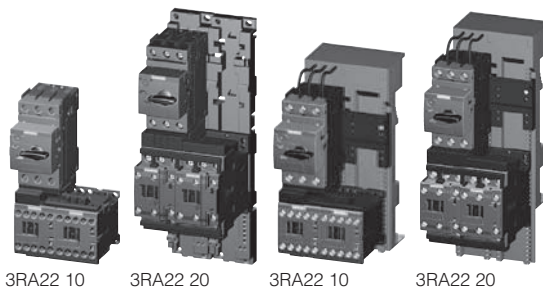
Combination Starters & Starters for Group Installation

3RA1 / 3RA2

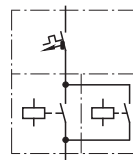
Reversing, DC Coil
up to 22 A

• Revised •
10/15/15

SIRIUS



Reversing duty




Rated control supply voltage 24 V DC
With screw connections

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches¹⁾ on the motor starter protector and the contactor can be easily fitted due to the modular system.
- With the contactor S0, an integrated NO contact is available for free use.

Combination Starter, UL508 Type F

All size S00 and S0 devices can be applied as Combination Starters with the addition of either of these line side connectors: 3RV29 28-1H, 3RV29 25-5EB or 3RV29 28-1K.

Size	UL Data						FLA setting range inverse-time delayed overload release	Consisting of the following single devices			Assembled starter		Weight approx.
	Single-phase HP ratings		Three-phase ²⁾ HP ratings		SCCR at 480 V	Motor starter protector		+ 2 contactors	+ Link module + Assembly kit RH/RS ³⁾	Screw terminals			
	115 V	230 V	200 V	230 V						460 V		575 V	
Selection depends on motor full load amps													
S00							3RV20	3RT20	3RA				
	--	--	--	--	--	--	65	0.11...0.16	11-0AA10	15-1BB42	1921-1DA00 '+' 2913-2AA1 ⁴⁾ '+' 2913-1DB1 (RS)	3RA22 10-0A□15-2BB4	0.934
	--	--	--	--	--	--	65	0.14...0.2	11-0BA10			3RA22 10-0B□15-2BB4	0.934
	--	--	--	--	--	--	65	0.18...0.25	11-0CA10			3RA22 10-0C□15-2BB4	0.934
	--	--	--	--	--	--	65	0.22...0.32	11-0DA10			3RA22 10-0D□15-1BB4	0.934
	--	--	--	--	--	--	65	0.28...0.4	11-0EA10			3RA22 10-0E□15-2BB4	0.934
	--	--	--	--	--	--	65	0.35...0.5	11-0FA10			3RA22 10-0F□15-1BB4	0.934
	--	--	--	--	--	--	65	0.45...0.63	11-0GA10			3RA22 10-0G□15-2BB4	0.934
	--	--	--	--	--	--	65	0.55...0.8	11-0HA10			3RA22 10-0H□15-2BB4	0.934
	--	--	--	--	--	1/2	65	0.7... 1	11-0JA10			3RA22 10-0J□15-2BB4	0.934
	--	--	--	--	1/2	1/2	65	0.9... 1.25	11-0KA10			3RA22 10-0K□15-2BB4	0.934
	--	1/10	--	--	3/4	3/4	65	1.1... 1.6	11-1AA10			3RA22 10-1A□15-2BB4	0.934
	--	1/8	--	--	3/4	1	65	1.4... 2	11-1BA10			3RA22 10-1B□15-2BB4	0.934
	--	1/6	1/2	1/2	1	1 1/2	65	1.8... 2.5	11-1CA10			3RA22 10-1C□15-2BB4	0.934
	1/10	1/4	1/2	3/4	1 1/2	2	65	2.2... 3.2	11-1DA10			3RA22 10-1D□15-2BB4	0.934
	1/8	1/3	3/4	3/4	2	3	65	2.8... 4	11-1EA10			3RA22 10-1E□15-2BB4	0.934
	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10			3RA22 10-1F□15-2BB4	0.934
	1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10			3RA22 10-1G□15-2BB4	0.934
	1/3	1	2	2	5	5	65	5.5... 8	11-1HA10	16-1BB42		3RA22 10-1H□16-2BB4	0.934
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			3RA22 10-1J□16-2BB4	0.934
	1/2	2	3	3	7 1/2	10	65	9... 12	11-1KA10	17-1BB42		3RA22 10-1K□17-2BB4	0.934
1	2	3	5	10	--	65	11...16	11-4AA10	18-1BB42		3RA22 10-4A□18-2BB4	0.934	
S0	1/6	1/2	1	1	3	3	65	3.5... 5	11-1FA10	24-1BB40	2921-1BA00 '+' 2923-1BB1 (RH) '+' 2923-1DB1 (RS)	3RA22 20-1F□24-0BB4	1.811
	1/4	1/2	1	1 1/2	3	5	65	4.5... 6.3	11-1GA10			3RA22 20-1G□24-0BB4	1.811
	1/3	1	2	2	5	5	65	5.5... 8	11-1HA10			3RA22 20-1H□24-0BB4	1.811
	1/2	1 1/2	2	3	5	7 1/2	65	7... 10	11-1JA10			3RA22 20-1J□24-0BB4	1.811
	1/2	2	3	3	7 1/2	10	65	9... 12.5	11-1KA10			3RA22 20-1K□24-0BB4	1.811
	1	2	3	5	10	--	65	11... 16	21-4AA10	26-1BB40		3RA22 20-4A□26-0BB4	1.811
	1 1/2	3	5	5	10	--	65	14... 20	21-4BA10			3RA22 20-4B□26-0BB4	1.811
	1 1/2	3	5	7 1/2	15	--	50	17... 22	21-4CA10	27-1BB40		3RA22 20-4C□27-0BB4	1.811
	2	3	5	7 1/2	15	--	50	20... 25	21-4DA10			3RA22 20-4D□27-0BB4	1.811
	2	5	7 1/2	10	20	--	50	27... 32	21-4EA10			3RA22 20-4E□27-0BB4	1.811
Add. weight													
Order No. supplement for mounting onto standard mounting rail or screw fixing										1	A		
• Without standard mounting rail adapter for size S00 ⁴⁾										2	B		
• With 2 standard mounting rail adapters for size S0													
Screw fixing with 2 push-in lugs each per motor starter is possible													
Order No. supplement for mounting onto Fastbus 60mm busbar system										1	D	0.486	
With 8US Fast Bus busbar adapter										2	D	0.306	
for size S00													
for size S0													

Order No. supplement for mounting onto standard mounting rail or screw fixing

- Without standard mounting rail adapter for size S00⁴⁾
 - With 2 standard mounting rail adapters for size S0
- Screw fixing with 2 push-in lugs each per motor starter is possible

Order No. supplement for mounting onto Fastbus 60mm busbar system

With 8US Fast Bus busbar adapter

for size S00
for size S0

1 A
2 B
1 D
2 D

0.486
0.306

1) For push-in lugs and auxiliary switches, see [Accessories on pages 4/44 and 4/52](#).

2) Selection depends on the motor full load amps. HP ratings for reference only.

3) Code for abbreviations:

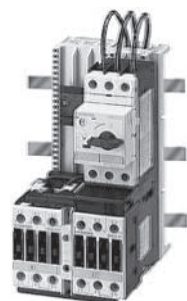
RH = assembly kit for reversing duty with standard rail mounting adapter in size S0.

RS = assembly kit for reversing duty with 8US Fast Bus busbar mounting.

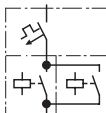
4) With standard rail mounting or screw fixing, the 3RA29 13-2AA1 wiring kit and link module are required for size S00.

Selection and ordering data

Representative image
of assembled starter



Reversing duty



For 60 mm Fast Bus busbar systems

- All starters are suitable for use in Group Installation applications per NEC 430-53 (c)
- Motor starter protector and contactor are linked electrically and mechanically by means of a link module and mounted on a Fast-bus Shoe
- Starter includes both electrical and mechanical interlocks
- Auxiliary switches¹⁾ can be added easily to the MSP and the contactor
- Size S3 is kit form only - assembly required

Combination Starter, UL508 Type F

- Size S2 devices can be applied as Combination Starters
- Size S3 devices can be applied as Combination Starters with the addition of a 3RT1946-4GA07 line side terminal kit
- SCCR: 65kA at 480V

						FLA setting range Inverse-time delayed overload release	Starter Order No.	Size	Consisting of the following individual devices		
Single-Phase HP Ratings		Three-Phase ²⁾ HP ratings						Motor starter protector	+ Contactor	+ Link module + Adapter shoe for Fastbus	
115V	230V	200V	230V	460V	575V	A					
110VAC 50Hz / 120VAC 60Hz											
3	5	10	10	25	30	22... 32	For customer assembly	S2	3RV20 31-4EA10 3RV20 31-4PA10 3RV20 31-4UA10 3RV20 31-4VA10 3RV20 31-4WA10 3RV20 31-4XA10 3RV20 31-4JA10	3RT2035-1AK60 3RT2036-1AK60 3RT2036-1AK60 3RT2037-1AK60 3RT2037-1AK60	3RA2931-1AA00 + 3RA2933-1DB
3	7.5	15	15	30	40	28... 36					
3	7.5	15	15	30	40	32... 40					
3	10	15	15	40	50	35... 45					
5	10	15	20	40	50	42... 52					
5	15	20	25	50	50	49... 59					
5	15	20	25	50	50	54... 65					
3	7 1/2	15	15	30	40	28 ... 40	3RA12 4□-4FD44-□AK6 3RA12 4□-4HD44-□AK6 3RA12 4□-4JD44-□AK6 3RA12 4□-4KD45-□AK6 3RA12 4□-4LD46-□AK6 3RA12 4□-4MD46-□AK6	S3	3RV10 41-4FA10 3RV10 41-4HA10 3RV10 41-4JA10 3RV10 41-4KA10 3RV10 41-4LA10 3RV10 41-4MA10	3RT1044-1AK60 3RT1045-1AK60 3RT1046-1AK60 3RT1046-1AK60	3RA1941-1AA00 + 3RA1943-2A ³⁾
5	10	15	20	40	50	36 ... 50					
5	15	20	25	50	60	45 ... 63					
7 1/2	15	25	25	60	75	57 ... 75					
10	20	30	30	75	–	70 ... 90					
10	20	30	30	75	–	80 ... 100					
24VDC											
3	5	10	10	25	30	22... 32	For customer assembly	S2	3RV10 31-4AA10 3RV10 31-4BA10 3RV10 31-4DA10 3RV10 31-4EA10 3RV10 31-4FA10 3RV10 31-4GA10 3RV10 31-4HA10	3RT1033-1BB40 3RT1034-1BB40 3RT1035-1BB40 3RT1036-1BB40 3RT1036-1BB40	3RA2931-1AA00 + 3RA2933-1DB
3	7.5	15	15	30	40	28... 36					
3	7.5	15	15	30	40	32... 40					
3	10	15	15	40	50	35... 45					
5	10	15	20	40	50	42... 52					
5	15	20	25	50	50	49... 59					
5	15	20	25	50	50	54... 65					
3	7 1/2	15	15	30	40	28 ... 40	3RA12 4□-4FD44-□BB4 3RA12 4□-4HD44-□BB4 3RA12 4□-4JD44-□BB4 3RA12 4□-4KD45-□BB4 3RA12 4□-4LD46-□BB4 3RA12 4□-4MD46-□BB4	S3	3RV10 41-4FA10 3RV10 41-4HA10 3RV10 41-4JA10 3RV10 41-4KA10 3RV10 41-4LA10 3RV10 41-4MA10	3RT1044-1BB40 3RT1045-1BB40 3RT1046-1BB40 3RT1046-1BB40	3RA1941-1BA00 + 3RA 1943-2A ³⁾
5	10	15	20	40	50	36 ... 50					
5	15	20	25	50	60	45 ... 63					
7 1/2	15	25	25	60	75	57 ... 75					
10	20	30	30	75	–	70 ... 90					
10	20	30	30	75	–	80 ... 100					
Order No. suffix											
Standard unit without auxiliary contacts.							5	1			
1 SPDT NO/NC MSP auxiliary and 1 NO front mount contactor auxiliary.							5	1			

RH = Reversing duty for rail mounting.

1) For auxiliary switches, see [Accessories page 4/44](#).

2) Selection depends on motor full load amps. Horsepower ratings for reference only.







3) Mechanical interlock must be ordered separately; see [Accessories page 4/50](#).

Auxiliary switches

Overview

The accessories listed here are parts and add-ons for the 3RA1/3RA2 direct-on-line and reversing starters as well as components for the customer assembly of motor starters

Selection and ordering data

					
3RV29 01-1E	3RV29 01-2E	3RV29 01-1A	3RV29 01-2A	3RV29 02-1A	3RV29 02-2D

	For MSPs	Screw Terminals		Weight approx.	Spring-type Terminals		Weight approx.
	Size	Order No.	kg		Order No.		kg

Auxiliary switches for motor starter protectors ¹

Transverse auxiliary switches

For front mounting

1 CO	S00, S0, S2	3RV29 01-1D	0.014	—	
	S3	3RV19 01-1D	0.020	—	
1 NO + 1 NC	S00, S0, S2	3RV29 01-1E	0.016	3RV29 01-2E	0.016
	S3	3RV19 01-1E	0.020	—	

Lateral auxiliary switches

Mountable on the left

1 NO + 1 NC	S00, S0, S2	3RV29 01-1A	0.036	3RV29 01-2A	0.035
	S3	3RV19 01-1A	0.030	—	

¹ One transverse auxiliary switch and one lateral auxiliary switch can be attached per motor starter protector.
When the lateral auxiliary switch with 2 NO + 2 NC is used, a transverse auxiliary switch is not allowed.

Rated control supply voltage Us				For MSPs	Screw Terminals	Weight approx.	Spring-type Terminals	Weight approx.
AC 50 Hz	AC 60 Hz	AC 50/60 Hz 100% ON period ¹	AC/DC 50/60 Hz, DC 5s ON period ²	Size	Order No.	kg	Order No.	kg

Auxiliary releases for motor starter protectors ³

Undervoltage releases

415	480	—	—	S00, S0, S2	3RV29 02-1AV1	0.117	—	
415	480	—	—	S3	3RV19 02-1AV1	0.129	—	

Shunt releases







—	—	20...24	20...70	S00, S0, S2	3RV29 02-1DB0	0.119	3RV29 02-2DB0	0.115
—	—	90...110	70...190		3RV29 02-1DF0	0.119	3RV29 02-2DF0	0.115
—	—	24	—	S3	3RV19 02-1DB0	0.113	—	
—	—	120	—		3RV19 02-1DF0	0.135	—	

¹ The voltage range is valid for 100% (infinite) ON period. The response voltage lies at 0.9 of the lower limit of the voltage range.

² The voltage range is valid for 5s ON period at AC 50 Hz/60 Hz and DC. The response voltage lies at 0.85 of the lower limit of the voltage range.

³ One auxiliary release can be mounted on the right per motor starter protector (does not apply to 3RV21 motor starter protectors with overload reset function).

Selection and ordering data

	For Conductors Size	Version	Screw Terminals Order No.	Weight approx. kg	Spring-type Terminals Order No.	Weight approx. kg
Auxiliary switch blocks for snapping on the front for contactors						
Cable entry from below  3RH29 11-1BA10  3RH29 11-1MA20	S00, S0, S2	1-pole 1 NC	3RH29 11-1BA10	0.020	—	
	S00, S0, S2	1-pole 1 NO	3RH29 11-1BA01	0.020	—	
	S00, S0, S2	2-pole 1 NO + 1 NC	3RH29 11-1MA11	0.050	—	
	S00, S0, S2	2-pole 2 NO	3RH29 11-1MA20	0.050	—	
	S3	2-pole 1 NO + 1 NC	3RH19 11-1MA11	0.075	—	
	S3	2-pole 2 NO	3RH19 11-1MA20	0.075	—	
	S3	2-pole 2 NC	3RH19 11-1MA02	0.075	—	
Cable entry from two sides  3RH29 11-1FA22	S00, S0, S2	4-pole 2 NO + 2 NC	3RH29 11-1FA22	0.060	3RH29 11-2FA22	0.049
	S3	4-pole 2 NO + 2 NC	3RH19 21-1FA22	0.075	—	
	S3	1-pole 1 NO	3RH19 21-1CA10	0.020	—	
	S3	1-pole 1 NC	3RH19 21-1CA01	0.020	—	
	S00	2-pole 1 NO + 1 NC	3RH29 11-1DA11	0.039	3RH29 11-2DA11	0.050
	S00	2-pole 2 NC	3RH29 11-1DA02	0.039	3RH29 11-2DA02	0.050
	S0, S2	2-pole 1 NO + 1 NC	3RH29 21-1DA11	0.039	3RH29 21-2DA11	0.050
	S0, S2	2-pole 2 NC	3RH29 21-1DA02	0.041	3RH29 21-2DA02	0.050
	S0, S2	2-pole 2 NO	3RH29 21-1DA20	0.041	3RH29 21-2DA20	0.050
Laterally mountable auxiliary switch blocks for contactors						
 3RH29 11-1DA11	S00	2 NC	3RH29 11-1DA02	0.020	3RH29 11-2DA02	0.050
	S00	1 NO + 1 NC	3RH29 11-1DA11	0.040	3RH29 11-2DA11	0.050
	S00	1 NO	3RH29 11-1DA20	0.040	3RH29 11-2DA20	0.050
	S0, S2	2 NC	3RH29 21-1DA02	0.050	3RH29 21-2DA02	0.050
	S0, S2	1 NO + 1 NC	3RH29 21-1DA11	0.050	3RH29 21-2DA11	0.050
	S0, S2	2 NO	3RH29 21-1DA20	0.050	3RH29 21-2DA20	0.050
Connection modules for contactors with screw terminals						
Adaptors for contactors						
 3RT19 26-4RD01	Ambient temperature $T_{u \max} = 60^\circ\text{C}$					
	S00	Rated operational current I_e at AC-3/400 V: 20A	3RT19 16-4RD01	0.020	—	
	S0	Rated operational current I_e at AC-3/400 V: 25A	3RT19 26-4RD01	0.020	—	
Plugs for contactors						
 3RT19 00-4RE01	S00, S0		3RT19 00-4RE01	0.025	—	

Combination Starters & Starters for Group Installation

3RA1 / 3RA2 Accessories

• Revised •
10/15/15

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Terminals

Selection and ordering data

For Conductors Size	Version	Screw Terminals Order No.	Weight approx. kg
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Auxiliary switch blocks for snapping on the front for contactors



3RV29 28-1H

Note: UL 508 demands for "Combination Motor Controller Type E" 1" air gaps and 2" creepage distances at lineside. The following terminal blocks must be used in S3 MSP's 3RV10. The S2 MSP 3RV10 conforms with stipulated air gaps and creepage distances without terminal block. Terminal blocks are not required for use according to CSA. With size S0 these terminal blocks cannot be used in combination with 3-phase busbars 3RV19.5. This also applies to size S3 in combination with transverse auxiliary switches.



3RV29 28-1K

Terminal block type E

for extended air/creepage distance (1" and 2")

S00, S0	3RV29 28-1H	0.120
S00, S0	3RV29 28-1K	0.120
S2	3RV29381K	0.120
S3	3RT19 46-4GA07	0.120




3RT19 46-4GA07

Selection and ordering data

For Conductors Size	Version	Rated control supply voltage U_s		Surge Suppressors Order No.	Weight approx. kg
		AC V	DC V		


Auxiliary switch blocks for snapping on the front for contactors

Size S00 — For plugging onto the front side of the contactors with and without auxiliary switch blocks

	3RT2.1	Varistors	24 ... 48 AC	24 ... 70 DC	3RT29 16-1BB00	0.010
			48 ... 127 AC	70 ... 150 DC	3RT29 16-1BC00	0.010
	3RT2.1	RC elements	24 ... 48 AC	24 ... 70 DC	3RT29 16-1CB00	0.010
			48 ... 127 AC	70 ... 150 DC	3RT29 16-1CC00	0.010
	3RT2.1	Noise suppression		12 ... 250 DC	3RT29 16-1DG00	0.010
	3RT2.1	Diode assemblies (diode and Zener diode) for DC operation and short break times		12 ... 250 DC	3RT29 16-1EH00	0.010



3RT29 16-1EH00

Size S0 — For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)

	3RT2.2	Varistors	24 ... 48 AC	24 ... 70 DC	3RT29 26-1BB00	0.010
			48 ... 127 AC	70 ... 150 DC	3RT29 26-1BC00	0.010
	3RT2.2	RC elements	24 ... 48 AC	24 ... 70 DC	3RT29 26-1CB00	0.010
			48 ... 127 AC	70 ... 150 DC	3RT29 26-1CC00	0.010
	3RT2.2	Diode assemblies for DC operation and short break times		24 DC	3RT29 26-1ER00	0.010
				30 ... 250 DC	3RT29 26-1ES00	0.010


3RT29 26-1BB00

Sizes S2

	3RT2.3	Varistors	24 ... 48 AC	24 ... 70 DC	3RT29 36-1BB00	0.010
			127 ... 240 AC	150 ... 250 DC	3RT29 36-1BD00	0.010
			48 ... 127 AC	70 ... 150 DC	3RT29 36-1BC00	0.010
	3RT2.3	RC elements	24 ... 48 AC	24 ... 70 DC	3RT29 36-1CB00	0.010
			127 ... 240 AC	150 ... 250 DC	3RT29 36-1CD00	0.010
			48 ... 127 AC	70 ... 150 DC	3RT29 36-1CC00	0.010
	3RT2.3	Diode assemblies	--	24 DC	3RT29 36-1ER00	0.010
			--	30 ... 250 DC	3RT29 36-1ES00	0.010

3RT2936-1E00

Sizes S3

	3RT10 4.	Varistors	24 ... 48 AC	24 ... 70 DC	3RT19 36-1BB00	0.025
			48 ... 127 AC	70 ... 150 DC	3RT19 36-1BC00	0.025
	3RT10 4.	RC elements	24 ... 48 AC	24 ... 70 DC	3RT19 36-1CB00	0.040
			48 ... 127 AC	70 ... 150 DC	3RT19 36-1CC00	0.040
	3RT10 4.	Diode assemblies for DC operation and short break times, can be plugged in at bottom		24 DC	3RT19 36-1TR00	0.025
				30 ... 250 DC	3RT19 36-1TS00	0.025

3RT19 36-1CC00

For additional surge suppression, [see page 2/73](#)

Combination Starters & Starters for Group Installation

3RA1 / 3RA2 Accessories


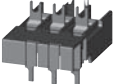
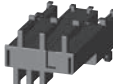


Surge suppressors, link modules

• Revised •
10/15/15

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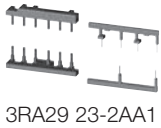
Selection and ordering data

		For MSP Size	For contactors	Actuating voltage of contactor	Screw Terminals Order No.		Pack Qty.	Weight approx. kg	
Auxiliary switch blocks for snapping on the front for contactors									
Electrical and mechanical link between motor starter protector and contactor									
 3RA29 11-2AA00	Single-unit packaging	S00, S0	S00	AC and DC	3RA19 21-1DA00				
		S00, S0	S0	AC	3RA29 21-1AA00	1 unit	0.055		
		S00, S0	S0	DC	3RA29 21-1BA00	1 unit	0.068		
		S2	S2	AC and DC	3RA29 31-1AA00	1 unit	0.104		
		S3	S3	AC	3RA19 41-1AA00	1 unit	0.090		
		S3	S3	DC	3RA19 41-1BA00	1 unit	0.088		
	Multi-unit packaging	S00, S0	S00	AC and DC	3RA19 21-1D	10 unit	0.021		
		S00, S0	S0	AC	3RA29 21-1A	10 unit	0.001		
		S00, S0	S0	DC	3RA29 21-1B	10 unit	0.001		
		S2	S2	AC and DC	3RA29 31-1A	5 unit	0.104		
 3RA29 11-2AA00					Spring-type Terminals 				
					Order No.				
	Single-unit packaging	S00	S00	AC and DC	3RA29 11-2AA00				
		S0	S0	AC ¹⁾ and DC	3RA29 21-2AA00	1 unit	0.040		
	Multi-unit packaging	S00	S00	AC and DC	3RA29 11-2A	10 unit	0.400		
		S0	S0	AC ¹⁾ and DC	3RA29 21-2A	10 unit	0.770		
	Hybrid link modules from motor starter protector to contactor								
	For mechanical and electrical connection between motor starter protector with screw terminals and contactor with spring-type terminals								
	 3RA29 11-2FA00	Single-unit packaging	S00	S00	AC and DC	3RA29 11-2FA00	1 unit	0.029	
			S0	S0	AC ¹⁾ and DC	3RA29 21-2FA00	1 unit	0.056	
Multi-unit packaging		S00	S00	AC and DC	3RA29 11-2F	10 unit	0.290		
		S0	S0	AC ¹⁾ and DC	3RA29 21-2F	10 unit	0.560		

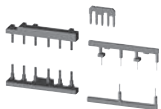
¹⁾ A spacer for height compensation on AC contactors with spring-type terminals, size S0 is optionally available, [see page 4/52](#).

Accessories

Wiring kits for contactors



3RA29 23-2AA1



3RA29 23-2BB1

For Conductors Size	Version	Screw Terminals Order No.	Pack Qty.	Weight approx. kg
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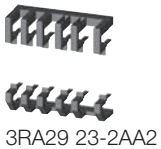
Reversing

S00	Electrical and mechanical connection for reversing contactors, optionally with integrated electrical and mechanical interlock	3RA29 13-2AA1	1 unit	0.001
S0		3RA29 23-2AA1	1 unit	0.001
S2	The kit contains: 2 connecting pins for 2 contactors, wiring modules on the top and bottom • for main and auxiliary circuits	3RA29 33-2AA1	1 unit	0.120

Wye-delta starting

S00	Electrical and mechanical link for three contactors of same size	3RA29 13-2BB1	1 unit	0.001
S0		3RA29 23-2BB1	1 unit	0.001
S2-S2-S0		3RA29 33-2C	1 unit	0.070
S2-S2-S2		29RA2933-2BB1	1 unit	0.160

Spring-type Terminals



3RA29 23-2AA2

Reversing Duty

S00	Electrical and mechanical connection for reversing contactors, optionally with integrated electrical and mechanical interlock	3RA29 13-2AA2	1 unit	0.001
S0		3RA29 23-2AA2	1 unit	0.001
S2	The kit contains: 2 connecting pins for 2 contactors, wiring modules on the top and bottom • for main circuits only	3RA29 33-2AA2	1 unit	0.001

Wye-delta starting

S00	Electrical and mechanical link for three contactors of same size	3RA29 13-2BB2	1 unit	0.001
S0		3RA29 23-2BB2	1 unit	0.001
S2-S2-S0		3RA29 33-2C	1 unit	0.001
S2-S2-S2		3RA29 33-2BB2	1 unit	0.001

Screw Terminals

Wiring kits for contactors



3RA29 16-1A

Reversing

S00	Switches 2 contactors in series	3RA29 16-1A	1 unit	0.001
S0		3RA29 26-1A	1 unit	0.001
S2		3RA29 36-1A	1 unit	0.001

Combination Starters & Starters for Group Installation

3RA1 / 3RA2 Accessories






Mounting kits for Fast Bus

• Revised •
10/15/15

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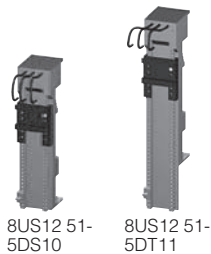


Accessories

	For Conductors Size	For MSPs Size	Version	Screw Terminals Order No.	Pack Qty.	Weight approx. kg
Mechanical interlocks						
	S2	--	For reversing contactors, laterally mounted, no electrical connections (each contactor has 1NO/1NC auxiliaries)	3RA29 34-2B		0.010
	S3	--	For reversing contactors, laterally mounted with 1 auxiliary contact (1 NC) each per contactor.	3RA19 24-2B		0.040
Terminals for contactor coil						
	S3	--	For A1 and A2 of reversing contactors (includes 2 x A1 and 1 x A2)	3RA19 23-3B		0.020
Standard mounting rail adapters						
			For mechanical fixing of motor start protector and contactor; for snapping onto standard mounting rail or for screw fixing.			
	S00, S0	S00, S0	Single-unit packaging	3RA29 22-1AA00	1 unit	0.001
	S2	S2		3RA19 31-1AA00	1 unit	0.020
	S3	S3		3RA19 41-1AA00	1 unit	0.250
	S00, S0	S00, S0	Multi-unit packaging	3RA29 22-1A	5 units	0.001
Side modules for standard mounting rail adapters						
	S00 ...S3	S00 ...S3	For standard mountin rail adaptors 10 mm wide, 96 mm long, for widening standard mounting rail adaptors when using lateral auxiliary switches, For size S00 to S2: 2 units required. For size S3: 3 units required	3RA19 02-1B	10 units	0.009
RH assembly kits for reversing duty and standard rail mounting						
			RH assembly kits for screw terminals			
	S0	S0	Comprising: • Wiring kits	3RA29 23-1BB1	1 unit	0.001
	S2	S2	• 2 standard mounting rail adaptors	3RA19 33-1B	1 unit	0.560
	S3	S3	• 2 connecting wedges	3RA19 43-1B	1 unit	0.810
			Link modules may be ordered separately.			
			RH assembly kits for spring-type terminals	Spring-type Terminals		
	S0	S0	Comprising: • Wiring kits	3RA29 23-1BB2	1 unit	0.001
			• 2 standard mounting rail adaptors			
			• 2 connecting wedges			
			• Spacers			
			Link modules may be ordered separately.			

For motor starter protector	For contactors	Version	Order No.	Std. pack qty.	Weight approx.
Size	Size				kg

Busbar adapters for 60 mm systems



For flat copper profiles according to DIN 46433
Width: 12 mm and 30 mm Thickness: 5 mm and 10 mm
also for T and double-T special profiles

For motor starter protectors and contactors with screw terminals

S00	S00	Rated current 16 A, 45 mm wide, 200 mm long
S0	S0	Rated current 32 A, 45 mm wide, 260 mm long
S2	S2	Up to 65A, 55mm wide, 260mm long

Screw terminals



8US12 51-5DS10	1 unit	0.183
8US12 51-5NT10	1 unit	0.183
8US12 61-6MT10	1 unit	0.572

For motor starter protectors and contactors with spring-type terminals

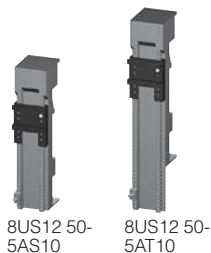
S00	S00	Rated current 16 A, 45 mm wide, 260 mm long
S0	S0	Rated current 32 A, 45 mm wide, 260 mm long

Spring-type terminals



8US12 51-5DT11	1 unit	0.183
8US12 51-5NT11	1 unit	0.183

Device holders for lateral mounting onto busbar adapters for 60 mm system



S00, S0	S00, S0	Up to 25 A, 45 mm wide, 200 mm long
S0	S0	Up to 40 A, 45 mm wide, 260 mm long
S2	S2	Up to 65A, 118mm wide, 260mm long (includes 8US1261-6MT10 adapter)

8US12 50-5AS10	1 unit	0.183
8US12 50-5AT10	1 unit	0.183
8US12 11-6MT10	1 unit	0.873

Side modules for widening busbar adapters

--	--	Including connecting wedges, for widening busbar adapters or device holders, 9 mm wide, 200 mm long
----	----	---

8US19 98-2BJ10	1 unit	0.023
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Spacers for fixing the motor starter onto the busbar adapter

--	S00, S0	(1 pack = 100 units)
----	---------	----------------------

8US19 98-1BA10	1 pack	0.183
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Vibration and shock kits for high vibration and shock loads

--	S00, S0	
----	---------	--

8US19 98-1CA10	1 unit	0.183
-----------------------	--------	-------

RS assembly kits for reversing duty for 60 mm busbar systems



3RA29 23-1DB1
only Busbar adapter
pictured

RS assembly kits for screw terminals

S00, S0	S00	Comprising:
S0	S0	• Wiring kits
S00	S0	• Busbar adapters
S2	S2	• Device holders
		• 2 connecting wedges
		• Side modules
		Link modules must be ordered separately.

Screw terminals



3RA29 13-1DB1	1 unit	0.001
3RA29 23-1DB1	1 unit	0.001
3RA29 23-1EB1	1 unit	0.001
3RA29 33-1DB1	1 unit	1.235



3RA29 23-1DB2
only Busbar adapter
pictured

RS assembly kits for spring-type terminals

S00	S00	Comprising:
S0	S0	• Wiring kits
		• Busbar adapters
		• Device holders
		• 2 connecting wedges
		• Spacers
		• Side modules
		Link modules must be ordered separately.

Spring-type terminals



3RA29 13-1DB2	1 unit	0.001
3RA29 23-1DB2	1 unit	0.001

Combination Starters & Starters for Group Installation

3RA1 / 3RA2 Accessories

• Revised •
10/15/15

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Connecting wedges, spaces, and tools

For motor starter protector Size	For contactors Size	Version	Order No.	Std. pack qty.	Weight approx. kg
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Connecting wedges



8US19 98-1AA00

For mechanical linking of busbar adapters and device holders or of standard mounting rail adapters (2 units per combination required)

8US19 98-1AA00

100 units

0.100

Spacers



3RA29 11-1CA00

For height compensation on AC contactors size S0 with spring-type terminals

S0 S0

Single-unit packaging

S0 S0

Multi-unit packaging

Spring-type terminals



3RA29 11-1CA00

1 unit

0.001

3RA29 11-1C

5 units

0.001

Version	Order No.	Std. pack qty.	Weight approx. kg
---------	-----------	----------------	----------------------

Tools for opening spring-type terminals by hand



3RA29 08-1A

Screwdrivers

for all SIRIUS devices with spring-type terminals

Length approx. 200 mm,
3.0 mm x 0.5 mm,
titanium gray/black,
partially insulated

Spring-type terminals

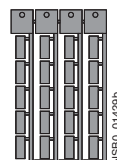


3RA29 08-1A

1 unit

0.045

Blank labels



3RT19 00-1SB20

Unit labeling plates¹⁾

for SIRIUS devices
20 mm x 7 mm,
pastel turquoise

3RT29 00-1SB20

340 units

0.200

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systems, Inc. www.murrplastik.com.

Selection and ordering data

For MSPs Size	For Conductors Size	Version	Order No.	Std. Pack Qty.	Weight approx. kg
Push-in lugs for screw fixing					
S00	--	For screwing the motor starter protector onto mounting plates; for each motor starter protector, 2 units are required.	3RV29 28-0B	10 units	0.100



3RV29 28-0B

Combination Starters & Starters for Group Installation

SIRIUS



Components for IEC types of coordination 1 and 2 at AC 500 V

1

2

3

4

Technical data

Three-phase standard motor ¹⁾ 4-pole at AC 500 V		Setting range Inverse-time delayed overload release	Motor starter protector	Contactor ²⁾	Size
Standard output <i>P</i> kW	Motor current (guide value) <i>I</i> A		Type	Type	

IEC Type of coordination 1 at $I_q = 50$ kA/AC 400 V Normal starting Class 10

1.5	3.6	3.5 ... 5	3RV20 11-1FA10	3RT20 15-1AP00	S00
2.2	4.9	4.5 ... 6.3	3RV20 11-1GA10		
3	6.5	5.5 ... 8	3RV20 11-1HA10		
4	8.5	7 ... 10	3RV20 11-1JA10	3RT20 16-1AP01	
5.5	11.5	9 ... 12.5	3RV20 11-1KA10	3RT20 17-1AP01	
7.5	15.5	11 ... 16	3RV20 11-4AA10	3RT20 18-1AP01	

IEC Type of coordination 2 at $I_q = 50$ kA/AC 400 V Normal starting Class 10

0.06	0.2	0.14 ... 0.2	3RV20 11-0BA10	3RT20 15-1AP01	S00
0.06	0.2	0.18 ... 0.25	3RV20 11-0CA10		
0.09	0.3	0.22 ... 0.32	3RV20 11-0DA10		
0.09	0.3	0.28 ... 0.4	3RV20 11-0EA10		
0.12	0.4	0.35 ... 0.5	3RV20 11-0FA10		
0.18	0.6	0.45 ... 0.63	3RV20 11-0GA10		
0.18	0.6	0.55 ... 0.8	3RV20 11-0HA10		
0.25	0.85	0.7 ... 1	3RV20 11-0JA10		
0.37	1.1	0.9 ... 1.25	3RV20 11-0KA10		
0.55	1.5	1.1 ... 1.6	3RV20 11-0AA10		
0.75	1.9	1.4 ... 2	3RV20 11-1BA10		
0.75	1.9	1.8 ... 2.5	3RV20 11-1CA10		
1.1	2.7	2.2 ... 3.2	3RV20 11-1DA10		
1.5	3.6	2.8 ... 4	3RV20 11-1EA10		
1.5	3.6	3.5 ... 5	3RV20 11-1FA10	3RT20 24-1AP01	S0
2.2	4.9	4.5 ... 6.3	3RV20 11-1GA10		
3	6.5	5.5 ... 8	3RV20 11-1HA10		
4	8.5	7 ... 10	3RV20 11-1JA10		
5.5	11.5	9 ... 12.5	3RV20 11-1KA10		
7.5	15.5	11 ... 16	3RV20 21-4AA10	3RT20 26-1AP01	
7.5	15.5	14 ... 20	3RV20 21-4BA10		
11	22	17 ... 22	3RV20 21-4CA10	3RT20 27-1AP01	
11	22	20 ... 35	3RV20 21-4DA10		
15	29	27 ... 32	3RV20 21-4EA10		

1) Selection depends on the actual startup and rated data of the protected motor.

2) Rated control supply voltage 120 V AC. Other voltages are possible.


Combination Starters & Starters for Group Installation

Components for IEC types of coordination 1 and 2 at AC 500 V

• Revised •
10/15/15



Technical data

Three-phase standard motor ¹⁾ 4-pole at AC 500 V		Setting range Inverse-time delayed overload release	Motor starter protector	Contactor ²⁾	Size
Standard output <i>P</i> kW	Motor current (guide value) <i>I</i> A	 A	Type	Type	
IEC Type of coordination 1 at <i>I</i> _q = 50 kA/AC 500 V Normal starting Class 10					
On request			3RV2031-4DA10	3RT20 35-1AK60	S2
On request			3RV2031-4EA10	3RT20 35-1AK60	
On request			3RV2031-4FA10	3RT20 35-1AK60	
On request			3RV2031-4GA10	3RT20 36-1AK60	
On request			3RV2031-4HA10	3RT20 36-1AK60	
37	53	45 ... 63	3RV1041-4JA10	3RT10 44-1AK60	S3
45	64	57 ... 75	3RV1041-4KA10	3RT10 44-1AK60	
55	78	70 ... 90	3RV1041...4LA10	3RT10 45-1AK60	
IEC Type of coordination 2 at <i>I</i> _q = 50 kA/AC 500 V Normal starting Class 10					
On request			3RV20 31-4AA10	3RT20 35-1AK60	S2
On request			3RV20 31-4BA10	3RT20 35-1AK60	
On request			3RV20 31-4DA10	3RT20 35-1AK60	
On request			3RV20 31-4EA10	3RT20 35-1AK60	
On request			3RV20 31-4FA10	3RT20 35-1AK60	
On request			3RV20 31-4GA10	3RT20 36-1AK60	
On request			3RV20 31-4HA10	3RT20 36-1AK60	
37	53	45 ... 63	3RV20 31-4JA10	3RT10 44-1AK60	S3
45	64	57 ... 75	3RV20 31-4KA10	3RT10 44-1AK60	
55	78	70 ... 90	3RV20 31-4LA10	3RT10 45-1AK60	

1) Selection depends on the actual startup and rated data of the protected motor.

2) Rated control supply voltage 120 V AC. Other voltages are possible.

Technical data

Three-phase standard motor 4-pole at AC 690 V ³⁾		Setting range MSP	Standard IEC circuit-breaker with limiting function	Subsequent MSP	Contactor ¹⁾	Size	Short-circuit switching capacity I_q at 690 V
Standard output	Motor current (guide value)		Type	Type	Type		
P kW	I A	A					kA

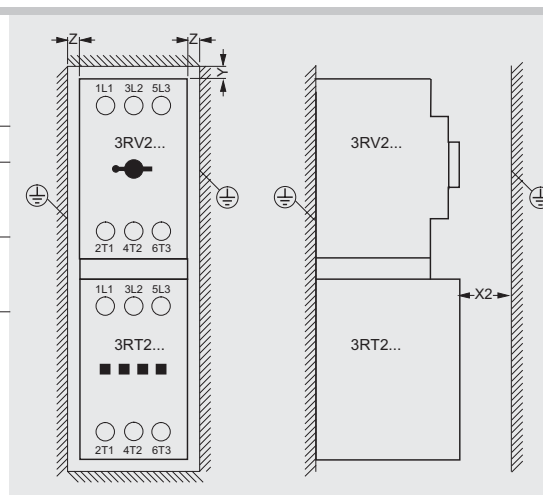
IEC Types of coordination 1 and 2 at AC 690 V Normal starting Class 10

On request	11 ... 16	3RV13 31-4HC10	3RV20 31-4AA10	3RT20 35-1AK60	S2	50
On request	14 ... 20	Size S2	3RV20 31-4BA10	3RT20 35-1AK60		
On request	18 ... 25	$I_n = 50$ A	3RV20 31-4DA10	3RT20 35-1AK60		
On request	22 ... 32		3RV20 31-4EA10	3RT20 35-1AK60		
On request	28 ... 40		3RV20 31-4FA10	3RT10 44-1AK60 ²⁾	S2/S3	50
On request	36 ... 45		3RV20 31-4GA10	3RT10 44-1AK60 ²⁾		
On request	40 ... 50		3RV20 31-4HA10	3RT10 45-1AK60 ²⁾		

Installation guidelines for AC 400/500 V

The following distances from earthed components must be observed when installing combinations:

Motor starter protectors in combination with contactors			Distances from earthed or live parts		
MSP	Contactor	Rated operational voltage	Y mm	X2 ⁴⁾ mm	Z mm
3RV2. 1 with	3RT20 1	400/500 V	20	10	9
3RV2. 2 with	3RT20 1	400/500 V	30	10	9
	3RT2 . 2	400/500 V	30	10	9
	3RT2 . 3	400/500 V	30	10	9
3RV2. 3 with	3RT20 2	400/500 V	50	10	10
	3RT2 . 3	400/500 V	50	10	10
	3RT10 4	400/500 V	50	10	10
3RV1. 4 with	3RT10 4	400 V	90	10	12
	3RT10 4	500 V	220	10	20



- No upstream circuit-breaker required; short-circuit proof up to 100 kA.

- Rated control supply voltage 120 V AC. Other voltages are possible.
- With these combinations, the distance between the subsequent MSP and the contactor must be at least 10 cm.
- Selection depends on the specific startup and rated data of the protected motor.
- Minimum distance to contactor at front. For the MSP, no minimum distance at the front must be maintained.

Combination Starters & Starters for Group Installation

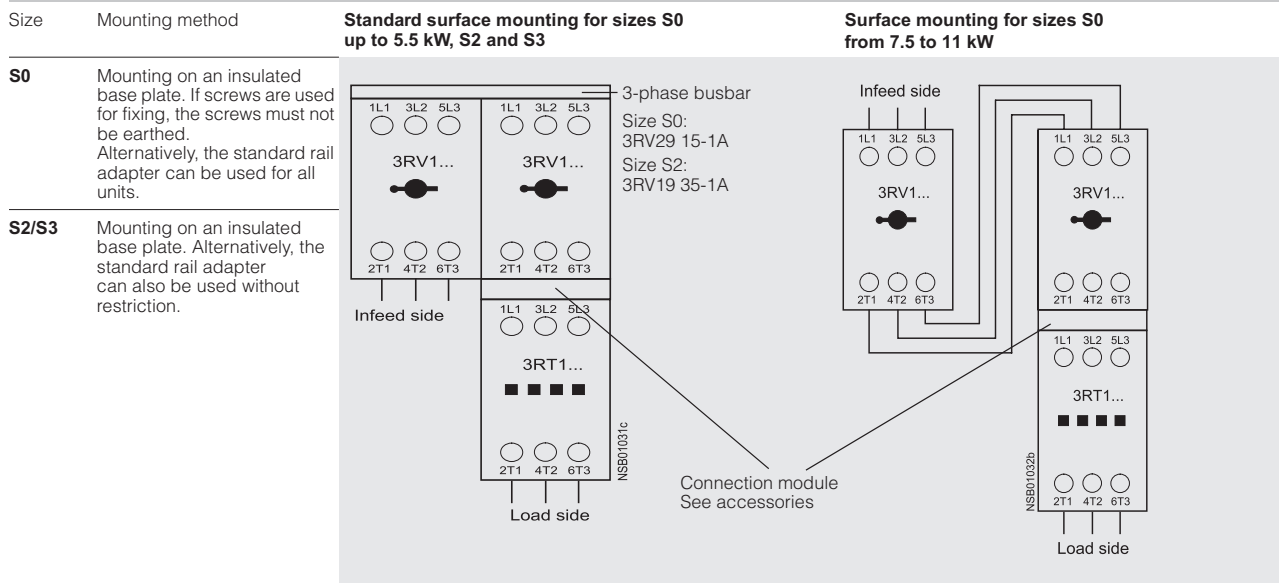
3RA1 / 3RA2
up to 100 A

• Revised •
10/15/15



Technical data

Installation guidelines for AC 690 V

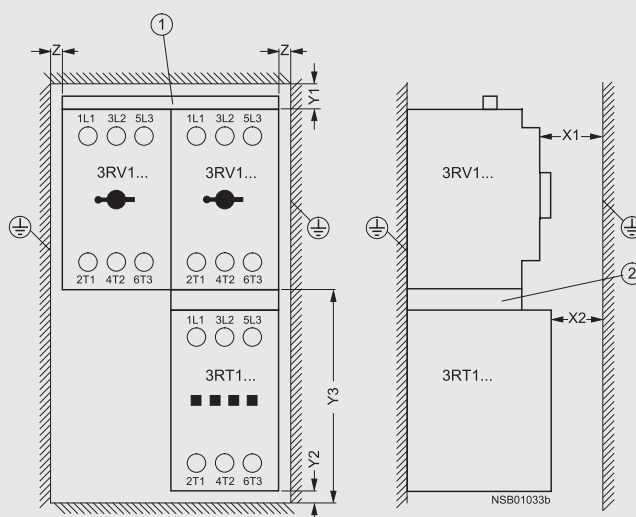


The following distances from earthed components must be observed when installing combinations:

Two MSPs in combination with contactors			Distances from earthed or live components					
MSP	Contactor	Rated operational voltage	Y1 mm	Y2 mm	Y3 mm	X1 mm	X2 mm	Z mm
3RV2. 2 with	3RT20 2	690 V	80	10	95	20	14	20
3RV2. 3 with	3RT20 3	690 V	50	10	120	10	32	10
	3RT10 4	690 V	50	10	120	10	40	10

a 3-phase busbar:

Size S0: 3RV29 15-1A
Size S2: 3RV19 35-1A



b In combination with size S2 MSPs and size S3 contactors, a spacing of 100 mm must be maintained.



Combination Starters & Starters for Group Installation

• Revised •

10/15/15

3RA1 / 3RA2
up to 100 A

1

2

3

4

Technical data

General data

Specifications		IEC 60 947-1, EN 60 947-1 (VDE 0660 Part 100) IEC 60 947-2, EN 60 947-2 (VDE 0660 Part 101) IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)			
Type		3RA2. 1	3RA2. 2	3RA2. 3	3RA1.4
Size		S00	S0	S2	S3
Number of poles		3	3	3	3
Max. rated current I_{nmax} (= max. rated operational current I_e)	A	16	32	65	100
Permissible ambient temperature	°C for storage/transport °C for operation	-55 ... +80 -20 ... +60 (restrictions apply at more than +60 °C)		-50 ... +80 -20 ... +60	
Rated operational voltage U_o	V	690			
Rated frequency	Hz	50/60			
Rated insulation voltage U_i	V	690			
Rated impulse withstand voltage U_{imp}	kV	6			
Release class (CLASS)	acc. to IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)	10			
Rated fused short-circuit current I_{cs} at 50/60 Hz AC 400 V acc. to IEC 60 947-4-1, DIN EN 60 947-4-1 (VDE 0660 Part 102)	kA	150		100	50
Types of coordination to IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)		1)			
Power losses P_{vmax} of all main conducting paths depending on the rated current I_n (upper current setting range)	<ul style="list-style-type: none">• Up to 1.25 A• 1.6 - 6.3 A• 8 - 12 A• 16 A• 5 - 6.3 A• 8 - 12 A• 16 - 32 A• 25 - 32 A• 40 A• 45 - 50 A• 63 A• 75 - 90 A• 100 A	<ul style="list-style-type: none">WWWWWWWWWWWWW	<ul style="list-style-type: none">22.33.54.3	<ul style="list-style-type: none">2.33.54.3	<ul style="list-style-type: none">16.217.221 <

1) See selection and ordering data on pages 4/36 to 4/43.

Combination Starters & Starters for Group Installation

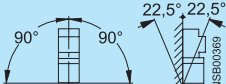
**3RA1 / 3RA2
up to 100 A**

• Revised •
10/15/15



Technical data

Conductor cross-sections of main circuit

Specifications		IEC 60 947-1, EN 60 947-1 (VDE 0660 Part 100) IEC 60 947-2, EN 60 947-2 (VDE 0660 Part 101) IEC 60 947-4-1, EN 60 947-4-1 (VDE 0660 Part 102)			
Type		3RA2. 1	3RA2. 2	3RA2.3	3RA11 4
Size		S00	S0	S2	S3
Number of poles		3	3	3	3
Connection type		Screw terminal M3 Posidrive size 2	Screw terminal M3 Posidrive size 2	Screw Terminals M6 Pozidriv size 2	Box terminals Allen screw
Terminal screw					
Conductor cross-sections (min./max) 1 or 2 conductors can be connected					
• Solid and stranded	mm ² mm ² mm ²	2 x (0.5 ... 1.5) ²⁾ only for contactors 2 x (0.75 ... 2.5) ²⁾ max. 2 x 4		2 x (1 ... 25) ²⁾ 1 x (1 ... 35) ²⁾ 2 x (1 ... 35) ²⁾ 1 x (1 ... 50) ²⁾	
• Finely stranded without end sleeve	mm ²	–			
• Finely stranded with end sleeves (DIN 46 228 T1)	mm ²	2 x (0.5 ... 1.5) ²⁾ 2 x (0.75 ... 2.5) ²⁾		2 x (1 ... 16) ²⁾ 1 x (1 ... 25) ²⁾ 2 x (1 ... 25) ²⁾ 1 x (1 ... 35) ²⁾	
• AWG cables, solid or stranded	AWG AWG AWG	2 x (20 ... 16) ²⁾ 2 x (18 ... 14) 2 x 12		2 x (18 ... 3) ²⁾ 1 x (18 ... 2) ²⁾ 2 x (18 ... 2) ²⁾ 1 x (18 ... 1) ²⁾	
Minimum/maximum conductor cross-sections					
• flexible with ferrule – 1 conductor	mm ²			0.75/25	2.5/50 ¹⁾
– 2 conductors	mm ²			0.75/16	2.5/35 ¹⁾
• solid or stranded – 1 conductor	mm ²			0.75/35	2.5/70 ¹⁾
– 2 conductors	mm ²			0.75/25	2.5/50 ¹⁾
Ribbon cable				yes	yes
Bus connection				–	yes
• solid or stranded	AWG			2 x (30 ... 2)	–
• stranded	AWG			–	2 x (10 ... 1/0)
Connection type		Spring Loaded connection			
• Solid and stranded	mm ²	2 x (0.5 ... 2.5)	–	2 x (0.5 ... 2.5)	
• Finely stranded without end sleeve	mm ²			2 x (0.5 ... 2.5)	
• Finely stranded with end sleeves	mm ²			2 x (0.5 ... 2.5)	
• AWG cables, solid or stranded	AWG	2 x (20 ... 12)		2 x (20 ... 14)	
Permissible mounting position		 <p>Attention: acc. to DIN 43 602 Start command "I" right-hand or above</p>			

1) Cable-lug and busbar connection possible after removing the box terminals.

2) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.



Overview

The 3RA combination starters consist of the 3RV MSP and the 3RT contactor. MSP and contactor are prewired and mechanically connected with preassembled kits (link modules, connection assembly kits and mounting rail or busbar adapters).

As the 3RA combination starters are constructed from 3RV MSPs and 3RT contactors, the same accessories can be used for the combination starter as for these MSPs and contactors.

Pre-assembled link modules are available as accessories for the power spectrum up to 75 HP. The desired combination starter can thus be assembled quickly and economically by the customer. A time saving is also achieved with the link modules as – unlike with conventional wiring systems – there is no need to rectify possible wiring errors.

As a combination starter rated for tap conductor protection for group installation the 3RV MSP is responsible for overload and short-circuit protection in the motor circuit. Back-up protective devices, such as fuses or SIEMENS Sentron circuit breakers are required as per NEC 430-53 guidelines for group installations for multiple motor applications

The 3RT contactor is ideal for extremely complex switching tasks requiring durable components.

The permissible ambient temperature is 60 °C with butt-mounting and without derating (70 °C possible subject to certain restrictions).

3RA combination starters are available for motors up to 75 Hp at 460 V AC and setting ranges from 0.14 A to 100 A.

3RA combination starters are supplied in four different sizes:

Size	Overall width mm	Max. rated current $I_{n\ max}$ A	For three-phase motors up to HP
S00	45	8	5
S0	45	22	15
S2	55	50	40
S3	70	100	75

Operating conditions

3RA combination starters are climate-proof. They are intended for use in enclosed rooms in which no severe conditions (such as dust, caustic vapors, hazardous gases) prevail. Suitable enclosures must be provided for installation in dusty and damp locations.

Accessories

The accessories for the special equipment, such as auxiliary contacts and undervoltage trips, can also be used for the 3RA combination starters.

In addition, certain accessories have been optimized for the combination starters. They include the top-connected, transverse auxiliary contact on the MSP with one changeover contact or one NO contact + one NC contact. Special auxiliary contact blocks that can be snapped on from below are available for the contactor.

These two accessories enable the combination starters to be wired easily without having to route cables via the equipment.

The special accessories for 3RA combination starters take the form of link modules for 3RV MSPs and 3RT contactors.

Technical data

For technical data, see pages 4/56-4/58. Additional details are contained in the respective tables for the 3RV MSPs and 3RT contactors.

Configuration

Overload tripping times

All the 3RA combination starters described here are designed for normal starting, in other words for overload tripping times of less than 10 s (CLASS 10). At rated-load operating temperature the tripping times are shorter, depending on the particular equipment and the setting range. The exact values can be derived from the tripping characteristics of the MSPs.

Classification types

DIN VDE 0660 Part 102 and IEC 60 947-4-1 make a distinction between two different types of coordination (types 1 and 2). Any short-circuits that occur are cleared safely by both types of coordination. The only differences concern the extent of the damage caused to the equipment by a short-circuit.

IEC Type of coordination 1

The combination starter may be non-operational after a short-circuit has been cleared. Damage to the contactor or to the overload relay is permissible. In 3RA load feeders, the MSP itself always achieves type of coordination 2.

IEC Type of coordination 2

There must be no damage to the overload trip or to any other components after a short-circuit has been cleared. The 3RA combination starter can resume operation without needing to be renewed. At most, it is permissible to weld the contactor contacts if they can be disconnected easily without any significant deformation.

Mounting

Complete equipment

The 3RA combination starters can be ordered as complete equipment for direct starting or for reversing mode. Control supply voltages of 50 Hz AC 230 V or DC 24 V and assembly on a 35 mm standard mounting rail or in a 40 or 60 mm busbar system are possible.

Special equipment for customer assembly can be ordered if other rated control supply voltages are required. The link modules simplify customer assembly of the load feeders.

The corresponding distances from earthed or live parts, as detailed in the technical data, must be observed.

Customer assembly

The standard devices can be combined optimally in terms of both technical data and dimensions, thanks to the modular system of the SIRIUS series.

The combination starters can thus be assembled easily by the customer. It is simply necessary to assemble the standard 3RV MSP and 3RT contactor and the appropriate link module together.

For the order numbers for special equipment and link modules, see the selection and ordering data.

For the link modules for direct starting or reversing mode and assembly on a standard mounting rail or busbar, see accessories.

If a MSP with a rotary operating mechanism is required for the lower setting ranges up to 12 A, the S0 MSP can also be assembled with an S00 contactor. A special connecting module is available for this purpose.

For the installation of feeders, it is imperative to use standard rail adapters, as from size S2 for direct starting and as from size S0 for reversing, to ensure the necessary mechanical strength. A standard rail adapter is not necessary if a busbar adapter is used.

Assembly

3RA combination starters are available for assembly on standard mounting rails in accordance with EN 50 022-35 x 15 or on busbar adapters with a busbar centre-line spacing of 40 or 60 mm and a busbar thickness of 5 or 10 mm.

The combination starters are also suitable for screw fixing.

Size S00 and S0 can be screwed on with the aid of plug-in clips (see accessories on page 4/47).

Combination Starters & Starters for Group Installation

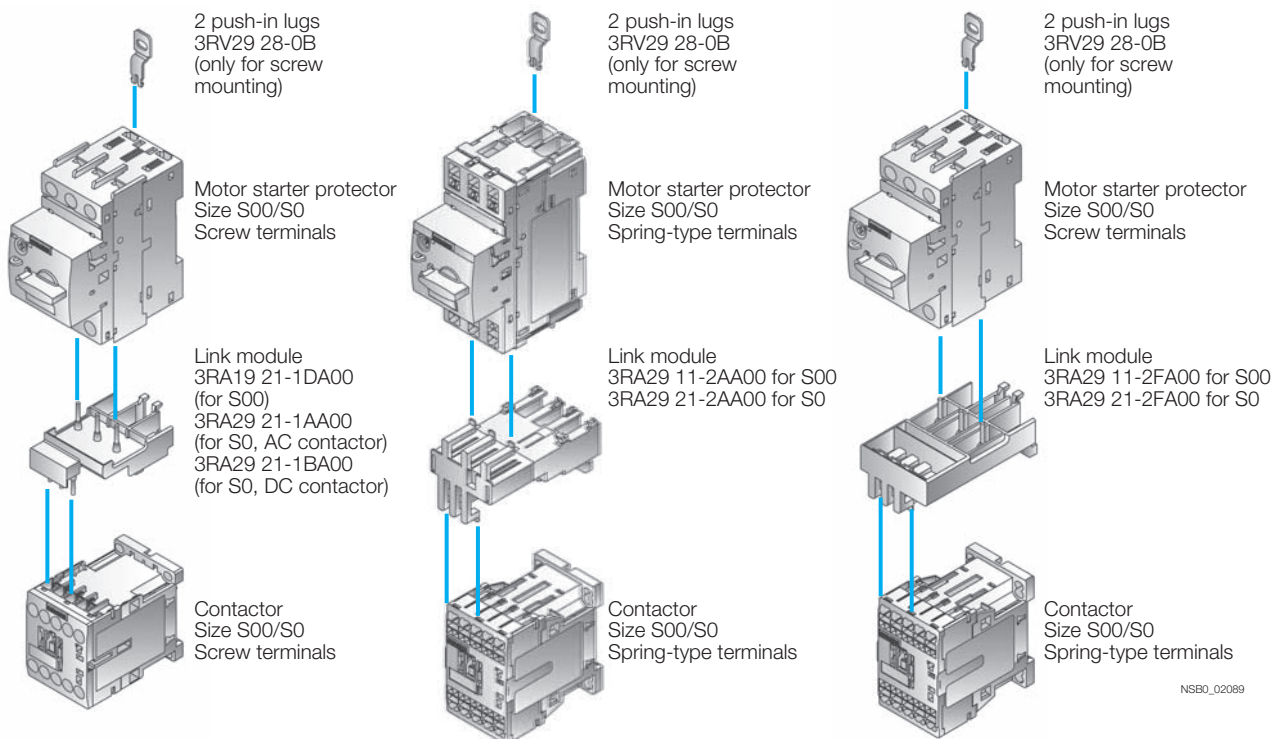
3RA1 / 3RA2
up to 100 A

• Revised •
10/15/15



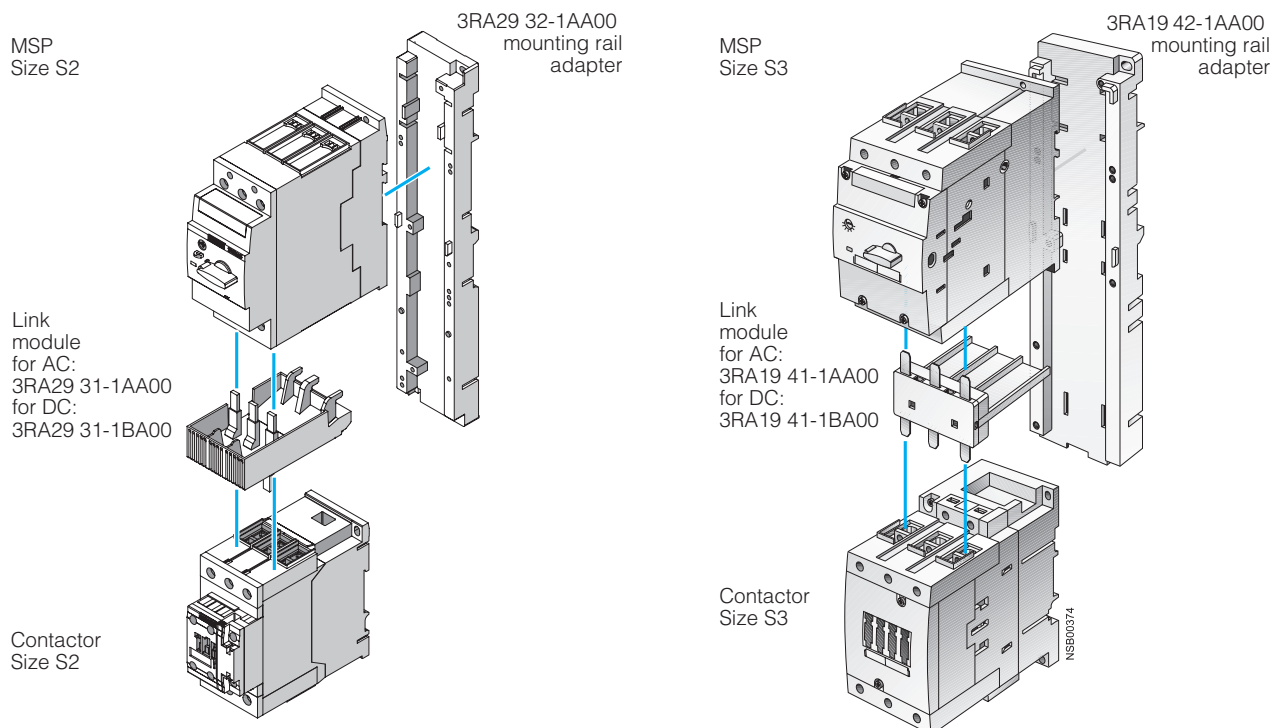
Mounting

Direct-on-line starting • For standard rail mounting or screw fixing • Sizes S00 and S0



Left: 3RA21 motor starter with screw connection
Center: 3RA21 motor starter with spring-type connection
Right: Motor starter protector combination with screw connection, with contactor with spring-type connection

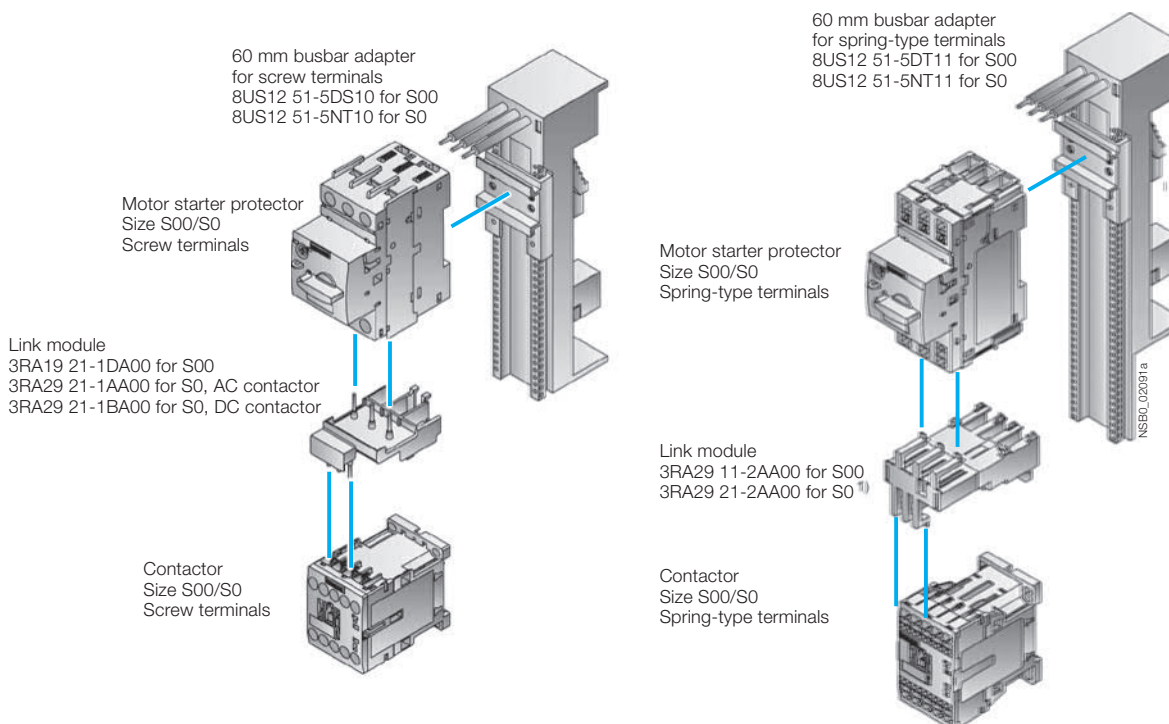
Direct-on-line starting • for standard rail mounting • size S2 and S3



These graphical overviews are shown without small mounting hardware (screws etc.).

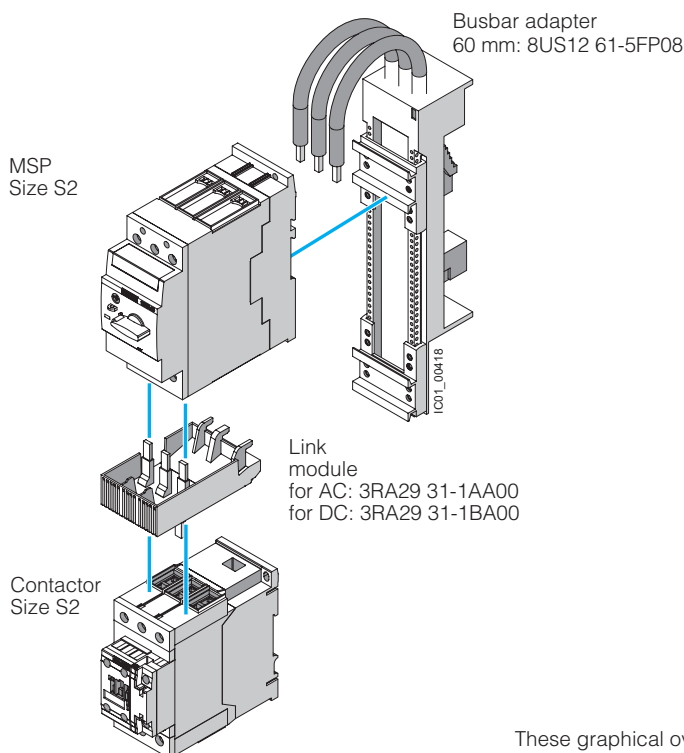
Mounting

DOL starting · for 60 mm busbar systems · size S00 and S0



¹⁾ Additional 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

DOL starting · for 40 mm and 60 mm busbar systems · size S2

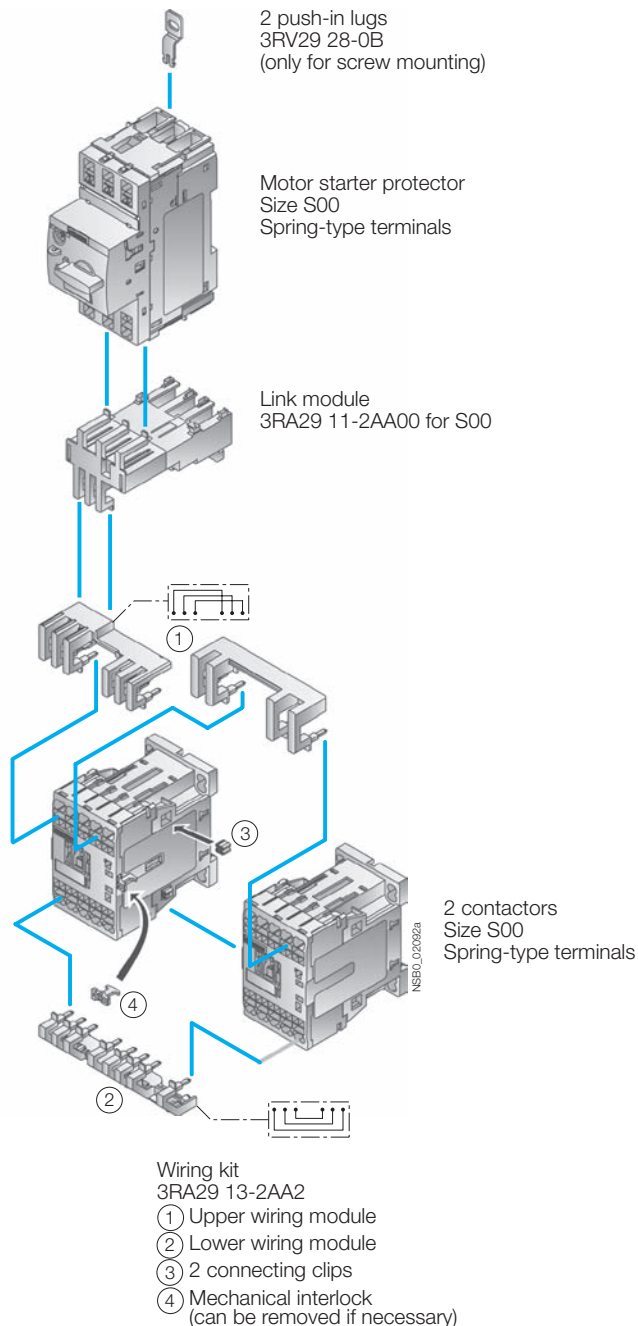
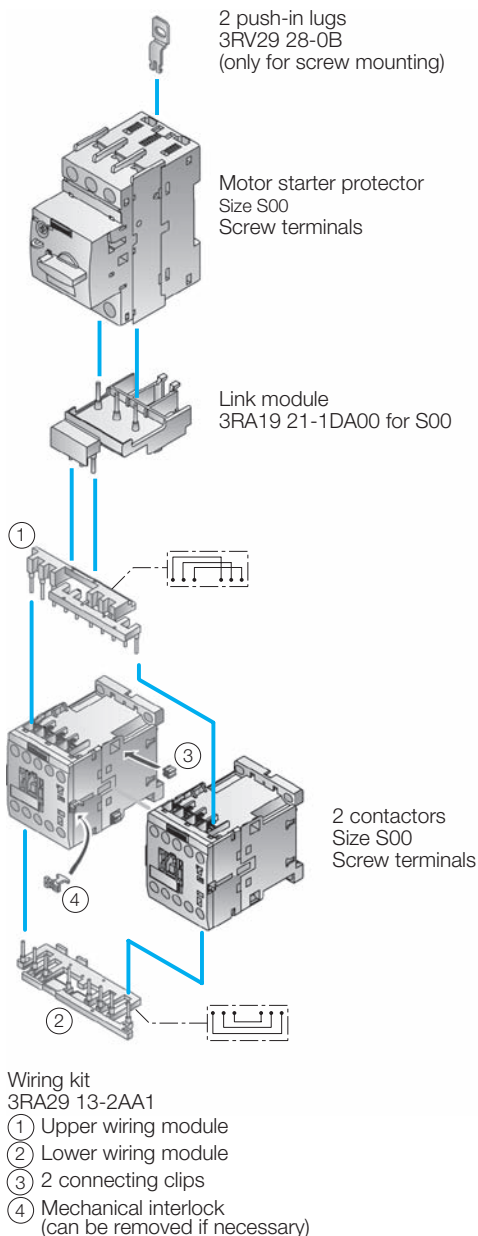


These graphical overviews are shown without small mounting hardware (screws etc.).

**3RA1 / 3RA2
up to 100 A**

Mounting

Reversing duty • For standard rail mounting or screw fixing • Size S00



Left: 3RA22 motor starter with screw connection, push-in lugs, 2 contactors for reversing duty and 3RA29 13-2AA1 wiring kit for connecting the contactors (incl. mechanical interlocking and connecting clips)

Right: 3RA22 motor starter with spring-type connection, push-in lugs, 2 contactors for reversing duty and 3RA29 13-2AA2 wiring kit (incl. mechanical interlocking and connecting clips)



Mounting

Reversing duty • For standard rail mounting • Size S0

RH assembly kit for reversing duty and standard rail mounting in size S0

For screw terminals:

3RA29 23-1BB1

For spring-type terminals:

3RA29 23-1BB2¹⁾

Comprising:

1 wiring kit

2 standard mounting rail adapters

2 connecting wedges

¹⁾ Also includes 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

Motor starter protector
Size S0
Screw terminals/
spring-type terminals

Link module

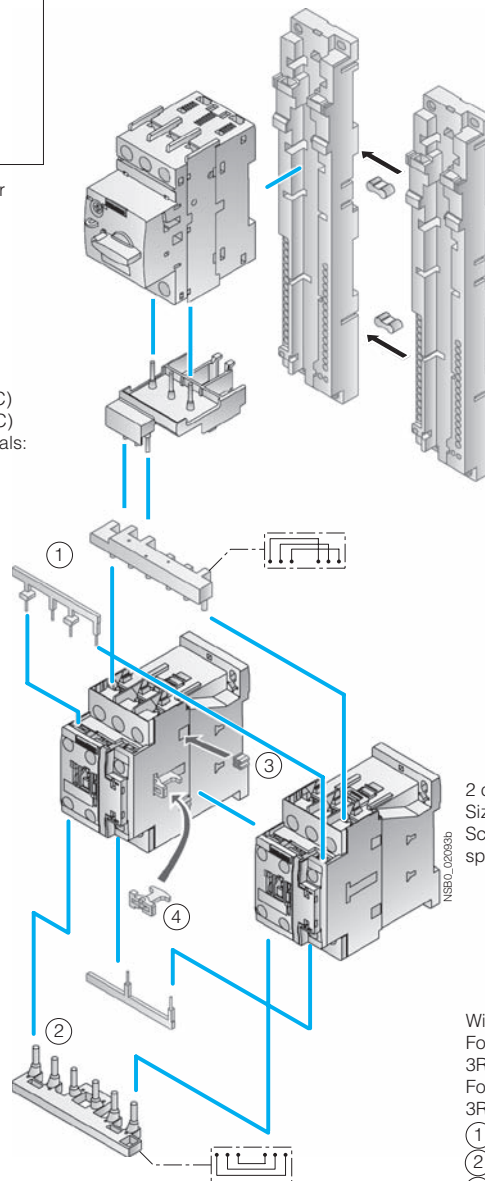
For screw terminals:

3RA29 21-1AA00 (AC)

3RA29 21-1BA00 (DC)

For spring-type terminals:
3RA29 21-2AA00²⁾

2 standard mounting
rail adapters
3RA29 22-1AA00
with 2 connecting wedges
8US19 98-1AA00



2 contactors
Size S0
Screw terminals/
spring-type terminals

Wiring kit

For screw terminals:

3RA29 23-2AA1

For spring-type terminals:

3RA29 23-2AA2

① Upper wiring module

② Lower wiring module

③ 2 connecting clips

④ Mechanical interlock
(can be removed if necessary)

²⁾ Additional 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals

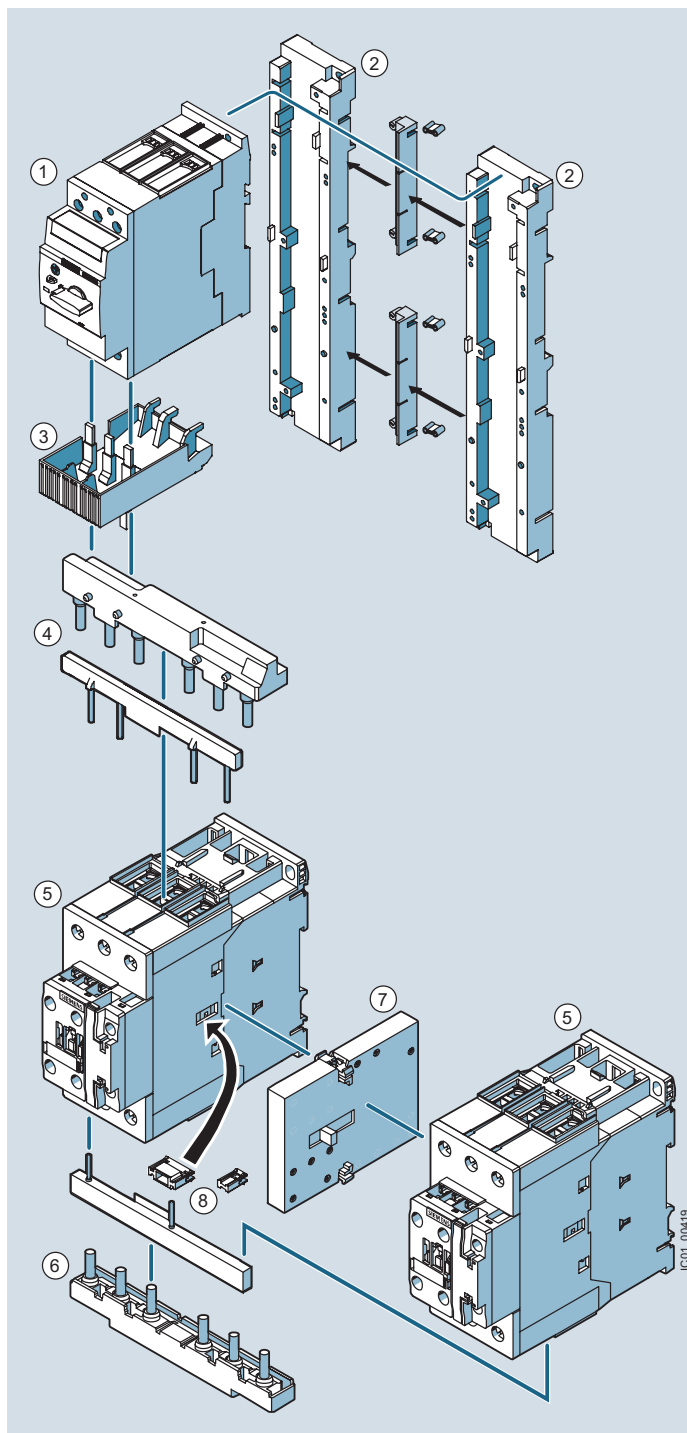
3RA22 motor starter for reversing duty and standard rail mounting in size S0
(the version with screw connection is shown in the picture)

3RA1 / 3RA2
up to 100 A

• Revised •
10/15/15



Reversing duty • For standard rail mounting • Size S2



RH assembly kit for reversing duty and standard rail mounting in size S2

3RA2933-1BB1

Comprising:

- 1 Wiring kit for main and auxiliary circuits
- 2 Rail adapters
- 2 Side modules
- 4 Connecting wedges
- 1 Mechanical locking device
- 2 Connecting pins for 2 contactors
- Fixing screws

1 Motor starter protector

Size S2
Screw terminals

2 Standard mounting rail adapter

3RA2932-1AA00
with 4 connecting wedges
8US1998-1AA00
and 2 side modules
3RA1902-1B

3 Link module

3RA2931-1AA00
Screw terminals

5 Contactor size S2

Screw terminals

Wiring kit

For screw terminals
3RA2933-2AA1

4 Upper wiring module

6 Lower wiring module

7 Mechanical interlock
3RA2934-2B

8 2 Connecting pins

Load feeder for reversing duty and standard rail mounting in size S2
(the version with screw terminals is shown in the picture)

Combination Starters & Starters for Group Installation



• Revised •
10/15/15

3RA1 / 3RA2
up to 100 A

1

2

3

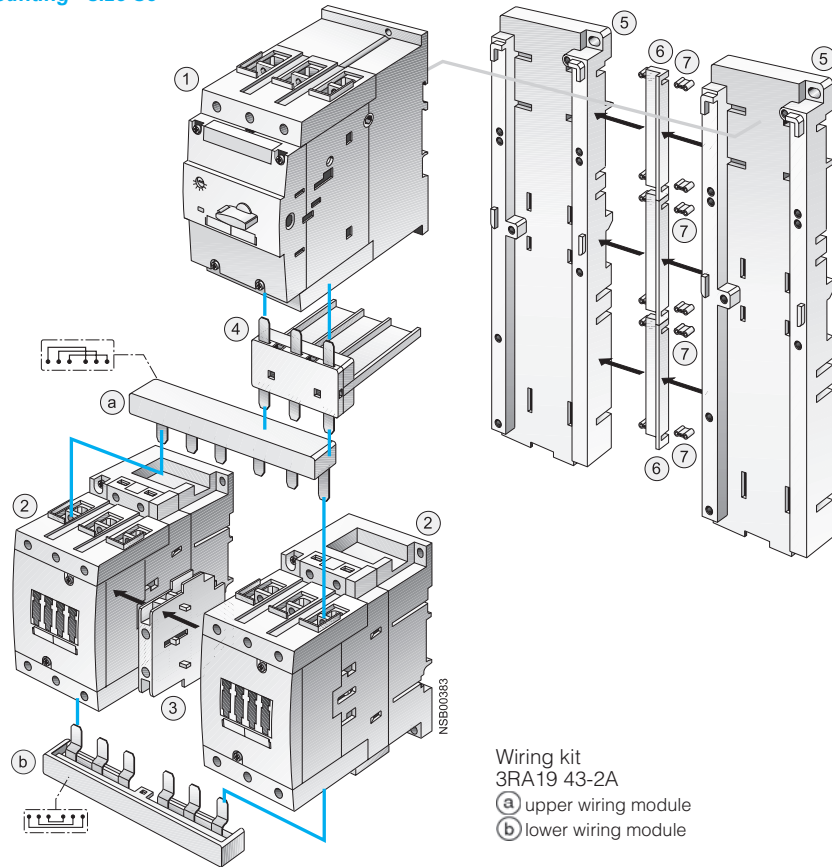
4

Reversing duty · for standard rail mounting · size S3

Assembly kit (RH)
for reversing duty
for rail mounting
3RA19 43-1B
consisting of:
1 wiring kit
2 adapters for rail
mounting ⑤
3 side modules ⑥
6 link wedges ⑦

- ① MSP size S3
- ② 2 contactors size S3
- ③ Mechanical interlock 3RA19 24-2B
- ④ Link module for AC: 3RA19 41-1AA00 for DC: 3RA19 41-1BA00
- ⑤ Adapters for rail mounting 3RA19 42-1AA00
- ⑥ 3RA19 02-1B side modules for adapter for rail mounting
- ⑦ Link wedges 8US19 98-1AA00

These graphical overviews are shown without small mounting hardware (screws etc.).



Wiring kit
3RA19 43-2A
a upper wiring module
b lower wiring module

Combination Starters & Starters for Group Installation

3RA1 / 3RA2
up to 100 A

• Revised •
10/15/15



Mounting

Reversing duty • For 60 mm busbar systems • Sizes S00 and S0

RS assembly kit for reversing duty and busbar mounting

Screw connection:

3RA29 13-1DB1 for S00
3RA29 23-1DB1 for S0

For spring-type connection:

3RA29 13-1DB2 for S00
3RA29 23-1DB2 for S0

Comprising:

1 wiring kit
1 busbar adapter
1 device holder
2 connecting wedges

¹⁾ Also includes 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

Motor starter protector
Size S00/S0
Screw terminals/
spring-type terminals

Link module

For screw terminals:

3RA19 21-1DA00 for S00
3RA29 21-1AA00 for S0, AC contactor
3RA29 21-1BA00 for S0, DC contactor

For spring-type terminals:²⁾

3RA29 11-2AA00 for S00
3RA29 21-2AA00 for S0

60 mm busbar adapter

For screw terminals:

8US12 51-5DS10 for S00

8US12 51-5NT10 for S0

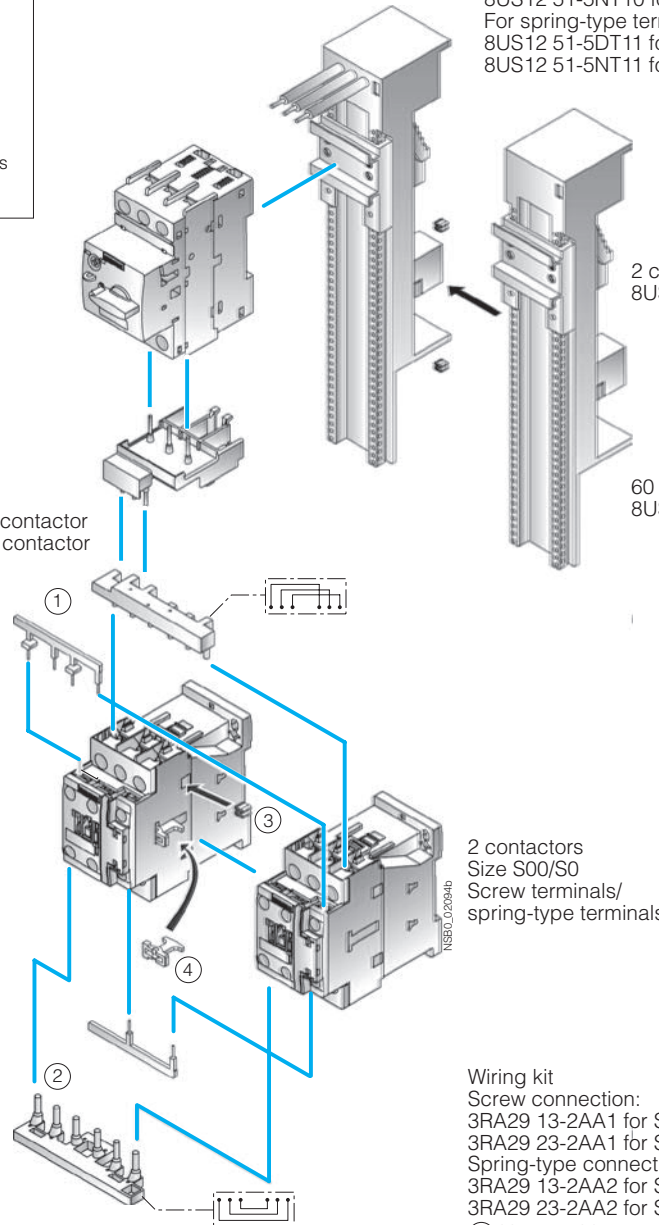
For spring-type terminals:

8US12 51-5DT11 for S00

8US12 51-5NT11 for S0

2 connecting wedges
8US19 98-1AA00

60 mm device holder
8US12 50-5AS10



2 contactors
Size S00/S0
Screw terminals/
spring-type terminals

Wiring kit

Screw connection:

3RA29 13-2AA1 for S00

3RA29 23-2AA1 for S0

Spring-type connection:

3RA29 13-2AA2 for S00

3RA29 23-2AA2 for S0

① Upper wiring module

② Lower wiring module

③ 2 connecting clips

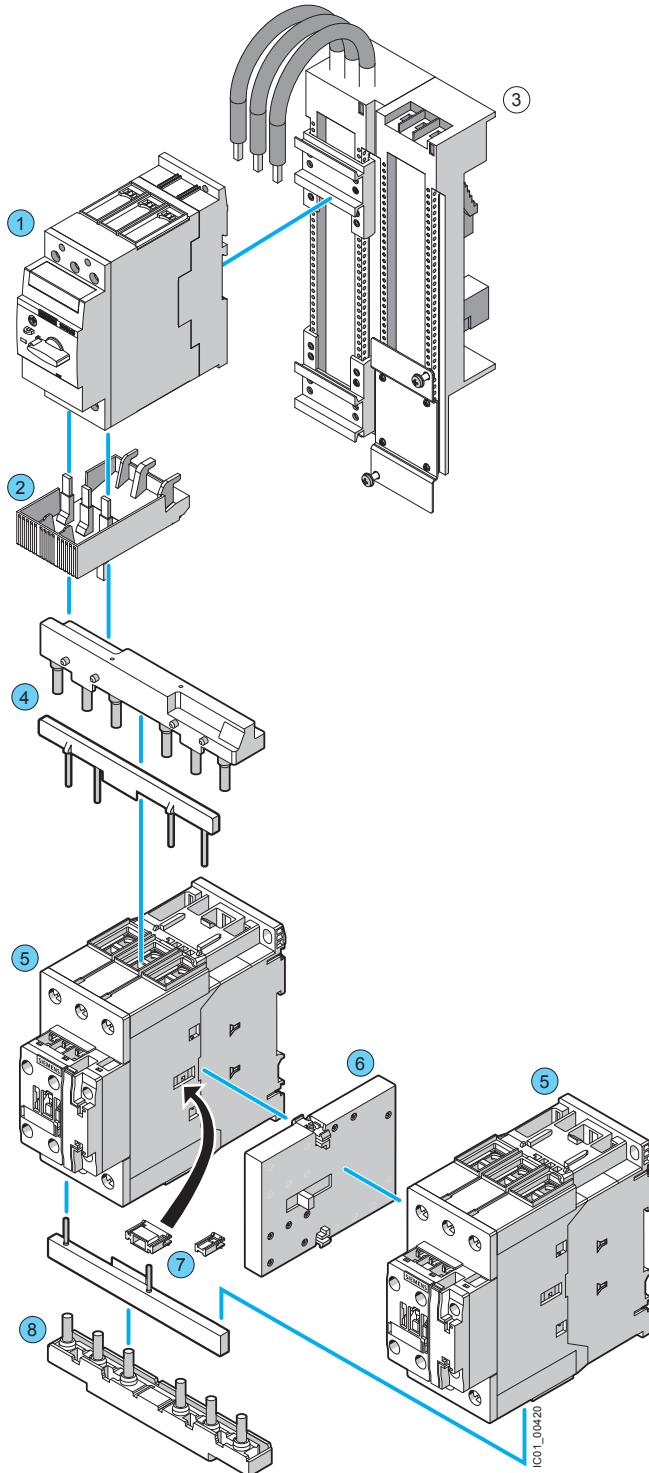
④ Mechanical interlock
(can be removed if necessary)

²⁾ Additional 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

3RA22 motor starter for reversing duty and 60 mm standard mounting rail in size S00/S0 (the version with screw connection is shown in the picture)

Mounting

Reversing duty · For 60 mm busbar systems · Size S2



RS assembly kit for reversing duty for busbar mounting

3RA2933-1DB1

Comprising:

- 1 Wiring kit for main and auxiliary circuits
- 1 busbar adapter and device holder
- 1 mechanical locking device
- 2 connecting pins for 2 contactors
- Fixing screws

- ① **Motor starter protector**
Size S2
Screw terminals
- ② **Link module**
3RA2931-1AA00
Screw terminals
- ③ **Busbar adapter 60 mm**
8US1211-6MT10
- ⑤ **Contactor**
Size S2
Screw terminals

Wiring kit

For screw terminals
3RA2933-2AA1

- ④ Upper wiring module
- ⑧ Lower wiring module
- ⑦ 2 connecting pins
- ⑥ Mechanical interlock
3RA2934-2B

Load feeder for reversing duty and 60 mm busbar in size S2
(the version with screw terminals is shown in the picture)

3RA1 / 3RA2
up to 100 A

Components for Fast Bus mounting

- ① Link module
for AC: 3RA19 41-1A
for DC: 3RA19 41-1B
- ② Mechanical
interlock
3RA19 24-2B

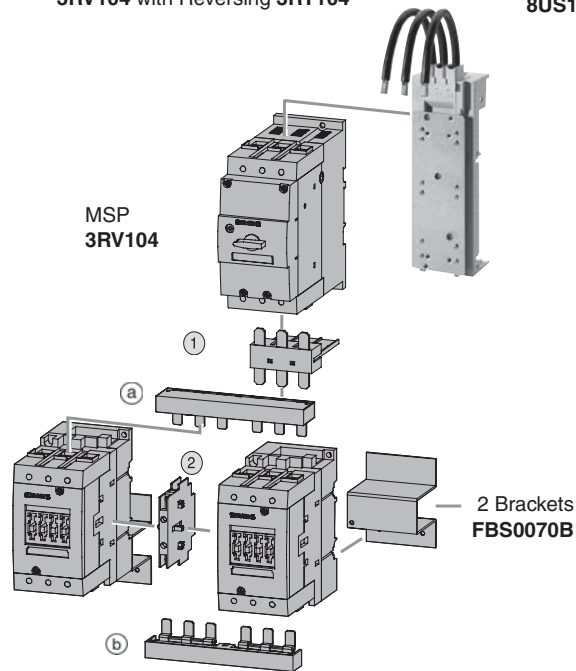
3RA1943-2A Wiring kit

- a Upper wiring module
- b Lower wiring module

2 Contactors
3RT104

3RV104 with Reversing 3RT104

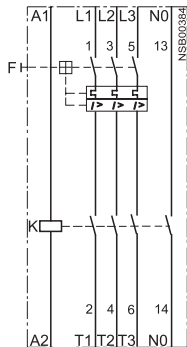
Adapter shoe
8US1211-4TR00



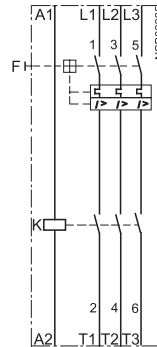
Circuit diagrams

Direct-on-line starting

Size S00: 3RA21.1

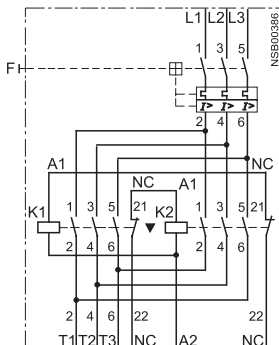


Sizes S0, S2 and S3: 3RA11/21 2, 3RA11/21 3

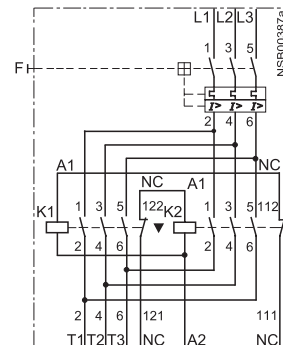


Reversing duty

Size S00: 3RA22



Size S0: 3RA22





3RA1 / 3RA2
up to 100 A

1

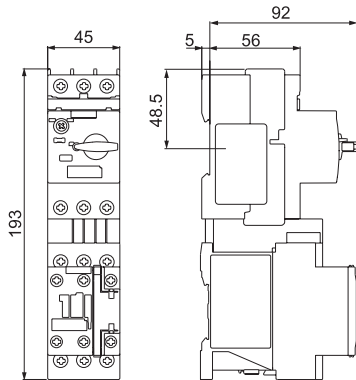
2

3

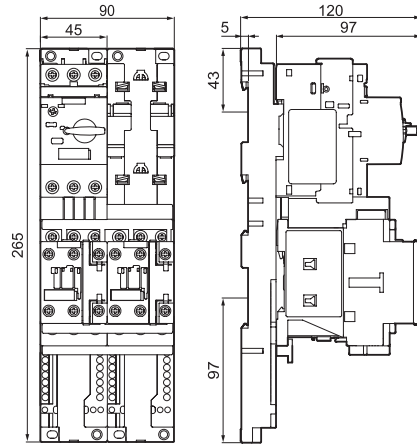
4

Dimension drawings

Size S00 · for standard rail mounting

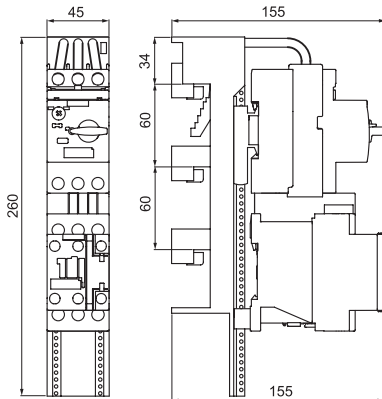


S0 direct-on-line starter,
AC, screw-type connection system
3RA2120-..A

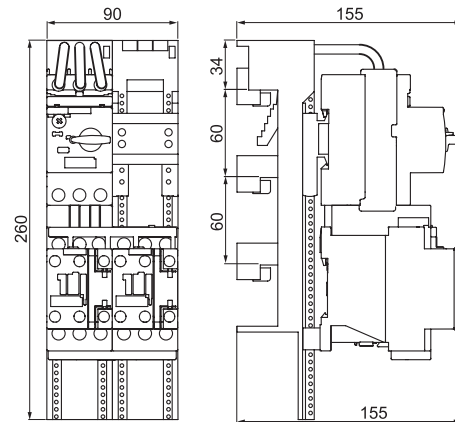


S0/S0 and S00/S0 reversing starters,
AC, screw-type connection system
3RA2220-..B...0AP0

Size S00 · for 40 mm and 60 mm busbar systems



S0/S0 and S00/S0 direct-on-line starters,
AC, screw-type connection system
3RA2120-..D...0AP0



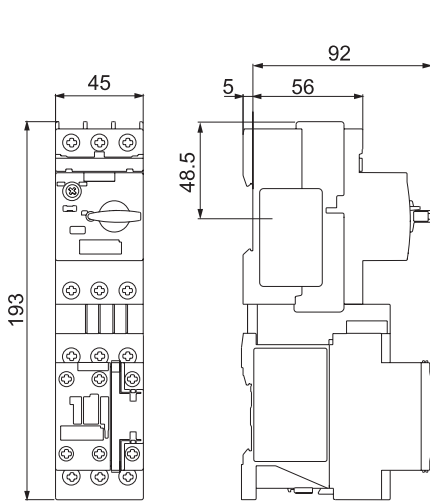
S0/S0 and S00/S0 reversing starters,
AC, screw-type connection system
3RA2220-..D...0AP0

When mounting the combinations, observe the installation guidelines (page 4/60-4/61).

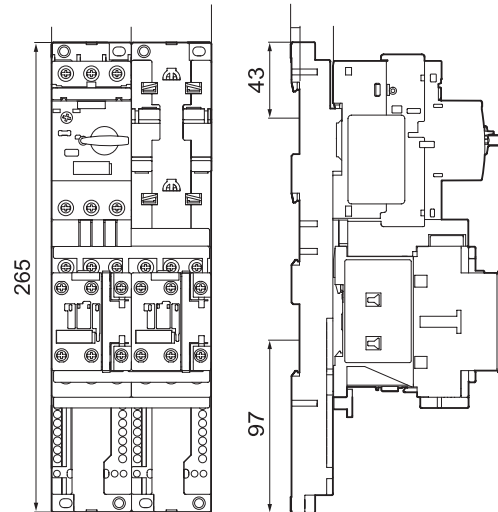
3RA1 / 3RA2
up to 50 A

Dimension drawings

Size S0 · for standard rail mounting

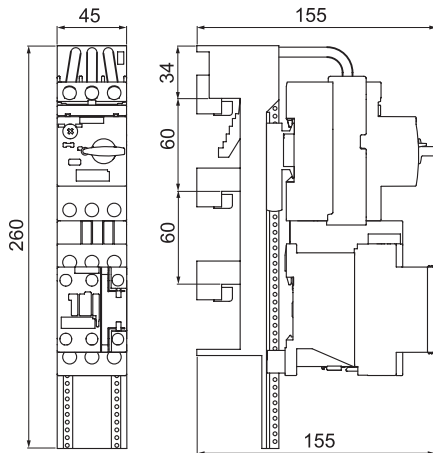


S0 direct-on-line starter, AC, screw-type connection system
3RA2120-..A

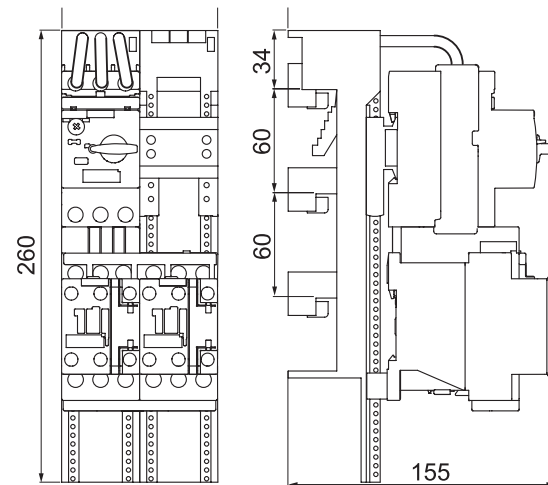


S0/S0 and S00/S0 reversing starters, AC, screw-type connection system
3RA2220-..B..-0AP0

Size S0 · for 40 mm and 60 mm busbar systems



S0/S0 and S00/S0 direct-on-line starters, AC, screw-type connection system
3RA2120-..D..-0AP0



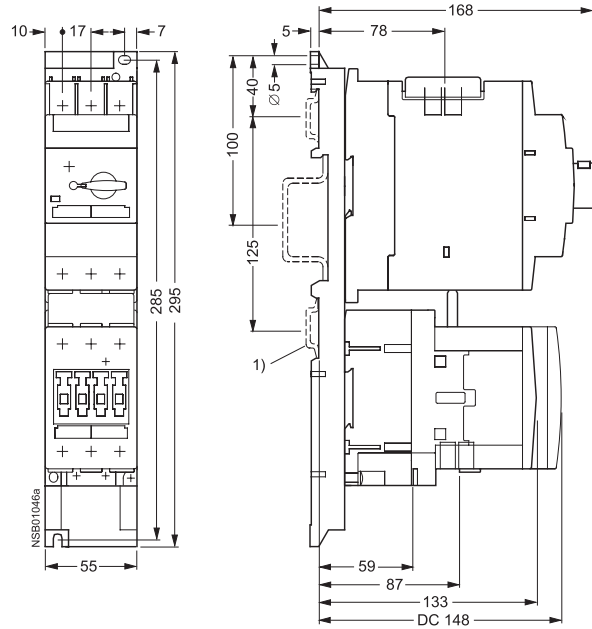
S0/S0 and S00/S0 reversing starters, AC, screw-type connection system
3RA2220-..D..-0AP0

When mounting the combinations, observe the installation guidelines (page 4/60-4/61).

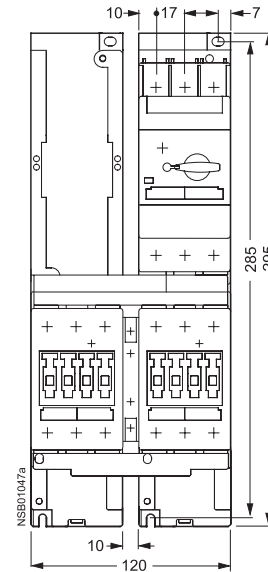
Dimension drawings

Size S2 · for standard rail mounting

Direct-on-line starting



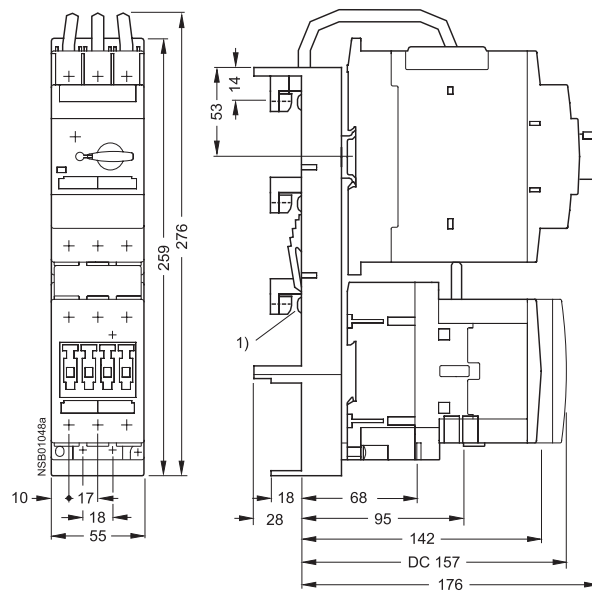
Reversing duty



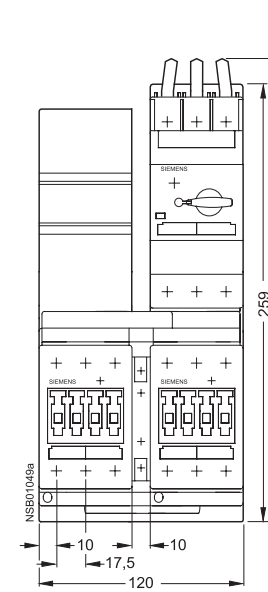
- 1) Alternative fixing methods
a) 2 35 mm mounting rails
acc. to DIN EN 50022
Spacing: 125 mm
Depth: 7.5 or 15 mm.
b) 1 75 mm mounting rail
acc. to DIN EN 50 023.

Size S2 · for 40 mm and 60 mm busbar systems

Direct-on-line starting



Reversing duty



- 1) Busbar adapter
suitable for rail thicknesses
of 5 and 10 mm
with chamfered edges.

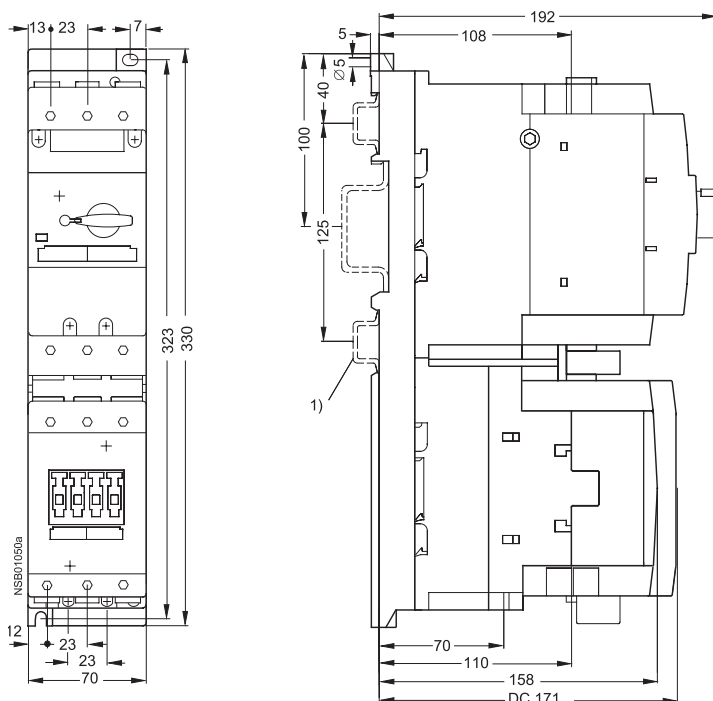
When mounting the combinations, observe the installation guidelines (page 4/60-4/61).

3RA1 / 3RA2
up to 100 A

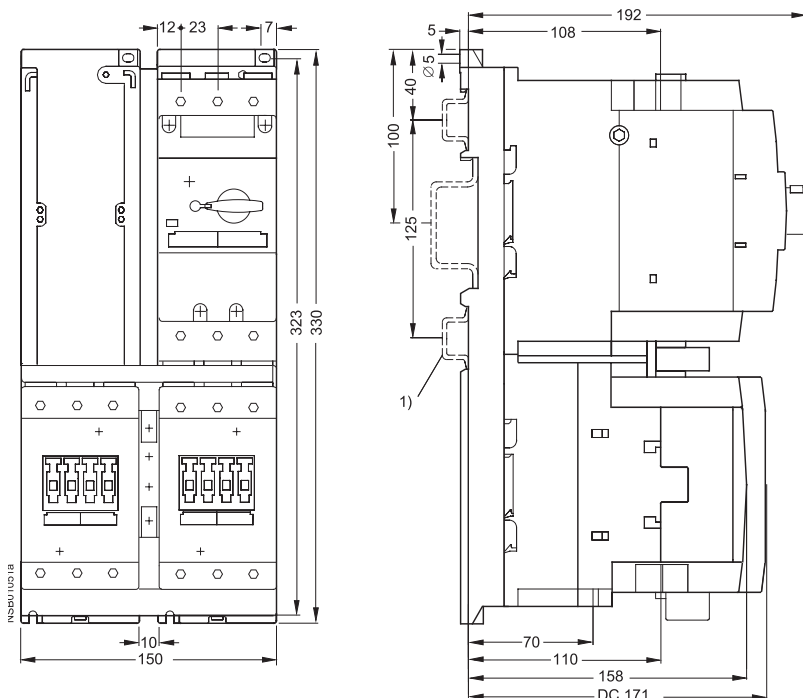
Dimension drawings

Size S3 · for standard rail mounting

Direct-on-line starting



Reversing duty

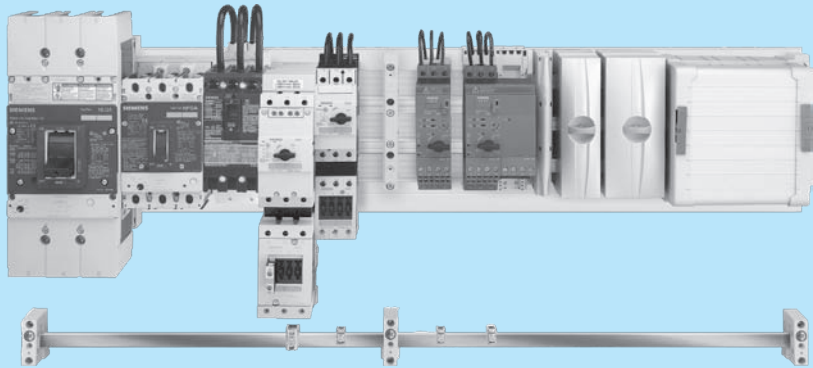


- 1) Alternative fixing methods
- a) 2 35 mm mounting rails acc. to DIN EN 50 022
Spacing: 125 mm
Depth: 7.5 or 15 mm.
 - b) 1 75 mm mounting rail acc. to DIN EN 50 023.

When mounting the combinations, observe the installation guidelines (page guidelines 4/60-4/64).

Contents

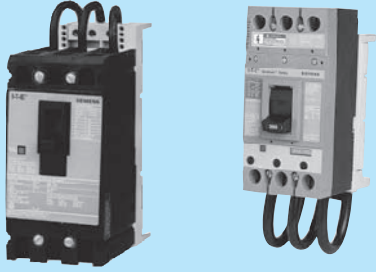
Fast Bus busbar adapter system



60 mm system	Page
Selection and ordering data	
• Busbar holders	5/9
• Fast Bus adapter shoes	5/11
• Incoming supply terminals	5/6
• Copper busbar	5/6
• Busbar covers	5/6
• Other accessories	5/6

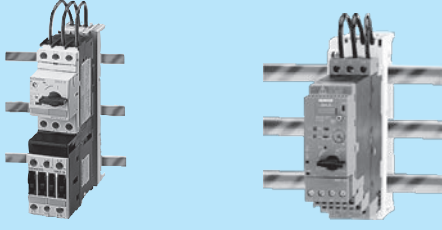
Overview	5/2
Introduction	5/3
Technical Data	5/3
Dimension drawings	5/10-5/15

FBCB Fast Bus circuit breakers



FBCB Fast Bus main and feeder circuit breakers	Page
Selection and ordering data	
• Fast Bus circuit breakers assemblies and kits	5/7
• Fast Bus adapter shoes for VL breakers	5/8

Fast Bus combination starters



- 3RA1 Fast Bus combination starters**
- 3RA2 Fast Bus combinations starters**
- 3RA6 Fast Bus compact starters**

Selection and ordering data
• See Section 4

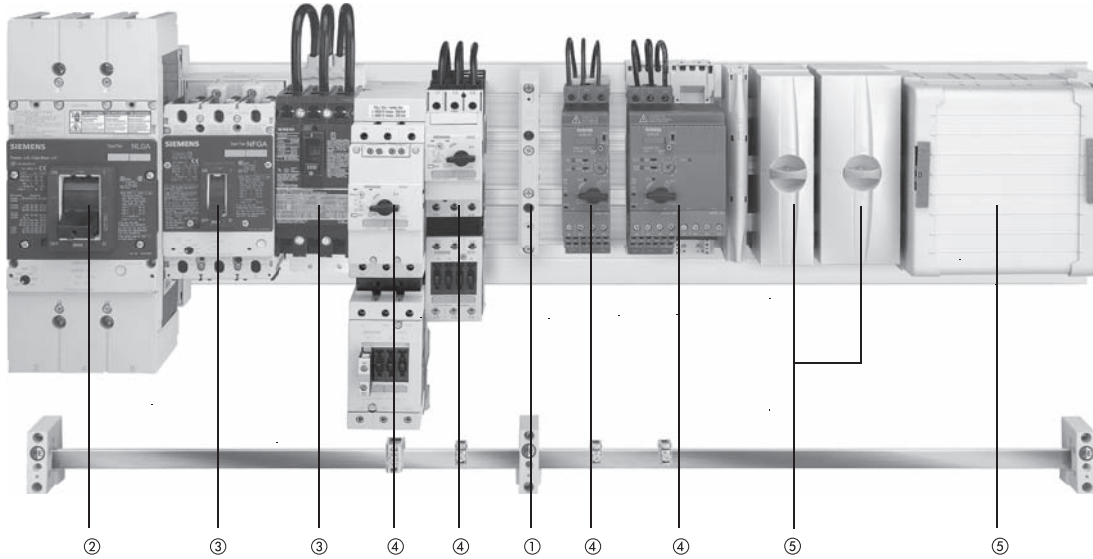
Fast Bus

Fast Bus Busbar Adapter System

Overview

Busbar adapter systems

Busbar adapter systems
with busbar centerline spacing of 60 mm



60 mm busbar system

for sharp-edged copper busbars
to DIN 46 433,
width 20 mm to 30 mm,
thickness 5 mm and 10 mm

- ① **Busbar holder**
End and intermediate holders
for flat copper profiles 5/6
- ② **Fast Bus main circuit breakers** 5/7
from 50 to 500A

- ③ **Fast Bus circuit breakers** 5/7
from 15 to 600A
- ④ **3RA1 Combination Starters** see
section 4

- ⑤ **Incoming supply terminals** 5/6

Fast Bus

Fast Bus Busbar Adapter System

Introduction

1

2

3

4

5

General

The Fast Bus Multi-Motor Control system is a 3-phase insulated busbar system and is ideal for space saving in panel designs. The system saves considerable line side wiring and space for multi-motor panels. It is also ideal for panels where several feeder breakers are used and will save significant wiring space and wiring labor. The system is also ideal for future expansion planning, when building control panels. SIRIUS 3RV/3RT starter combinations and Siemens circuit breakers are all adaptable to Fast Bus for convenient mounting and faster replacement times.

Fast Bus is ideal for industrial applications where system availability is important.

Features

- Simple economical installation
- Compact design
- Requires fewer mounting holes
- Domestic and International approvals
- Touch safe
- Modular design
- Provision for system expansion
- Clip-on shoes provide mechanical and electrical connections to panel mounted busbars
- Main and Feeder breakers mount to busbars

Benefits

- Saves installation time
- Reduces space requirements
- Minimizes layout time
- Allows flexibility for domestic and export business
- Protection for maintenance personnel
- Improves equipment mounting density
- Reduces time and costs associated with system expansion
- Reduces mounting and wiring time and provides trouble free connections
- Allows for quick retrofitting of breakers

How to Select Fast Bus

- 1) Determine the required load.
- 2) Select method to power Fastbus.

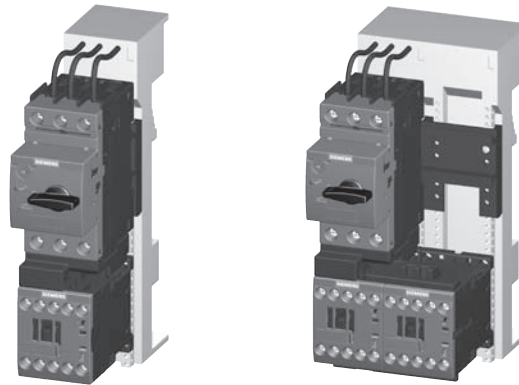
—Main lug up to 800A

—Circuit breakers, 15A to 500A

If load exceeds 500A, the CB must be separately panel mounted and fed to a main lug infeed module.

- 3) Select 3RV MSP & 3RT contactor components and appropriate adapter shoe or select preassembled 3RA starters. See section 4.

- 4) Select appropriate length busbar, busbar holders, insulation covers and any other required components.



General Ratings of Fastbus System

	IEC	Domestic
Rated operating voltage	690V	600V
Rated insulation voltage, IEC VDE	AC 1000V	N/A
Temperature stability	Up to 105 degrees C	N/A
Busbar support and adapter shoe material	Glass-reinforced polyamide	Same
Color	RAL 7035, light gray	Same

Ampacity

Busbar thickness and width		
5 x 20 mm	3/16" x 3/4"	362A
5 x 25 mm	3/16" x 1"	432A
5 x 30 mm	3/16" x 1 1/8"	500A
10 x 20 mm	3/8" x 3/4"	564A
10 x 25 mm	3/8" x 1"	660A
10 x 30 mm	3/8" x 1 1/8"	756A
720mm ²	---	1400A

For technical information on E and F frame circuit breakers used as main and feeder breakers, see section 17

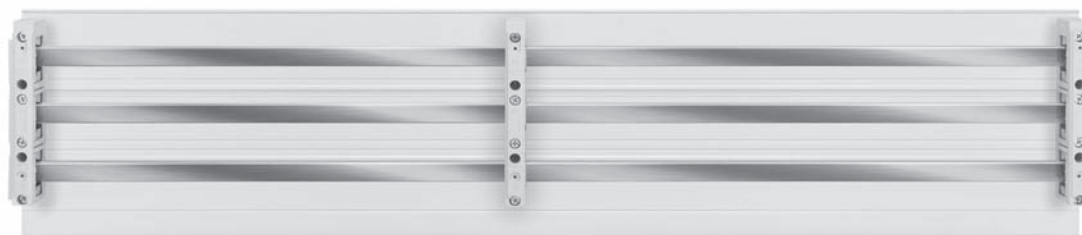
Thermal busbar currents, E-Cu, bare, at 35 °C ambient temperature in accordance with DIN 43 6711

Busbar dimensions	System	Thermal current at		
		65 °C	85 °C	105 °C
mm	mm	Busbar temperature A	Busbar temperature A	A
20 x 5	60	274	362	430
25 x 5	60	327	432	513
30 x 5	60	379	500	595
20 x 10	60	427	564	670
30 x 10	60	573	756	900

Fast Bus

Fast Bus Busbar Adapter System

Introduction



Fast Bus set-up

The Fast Bus system is designed to be easy to use and to save set up time.

8US Busbar holders

The 8US busbar holders are designed to accommodate ampacities up to 1400A. In some cases, the busbar holder will accept busbars in either 5mm or 10mm widths. Refer to page 5/6 for selection details.

High quality material

Busbar supports and fuse bases are manufactured from glass-fiber reinforced, thermoplastic polyester with the color RAL 7035, light gray. The material ensures excellent mechanical, chemical and electrical properties. Furthermore, the material has an extremely low flammability and meets the requirements of UL 94 V0.

8WC Busbar and busbar systems

The most common size busbar for applications in the US is the 8WC5053 (20 mm x 5 mm), however there are other styles available depending on your application.

Busbar systems with 60 mm busbar center-to-center clearance have now become firmly established in the US market.

The permissible busbar temperature is a decisive factor when dimensioning the busbars. The busbar temperature is dependent on the current, the current distribution, the busbar cross-section, the busbar surface, the position of the busbar, the convection and the ambient temperature. The values stated in the table on page 5/3 can only be considered as reference values because the conditions vary with each location. The values are based on constant current over the whole busbar length.

The trend toward busbars proves most advantageous when the incoming supply is centrally located and the load is distributed symmetrically on both sides.

For the assemblies of a busbar system in the feeder circuit the UL directives specify components with large clearance in air and creepage distances (see the table below). Components of the 8US1 busbar system which meet this requirement can be found in this chapter.

Note:

The design of an 8US1 busbar system for use in the feeder circuit always presumes the use of the UL base plate (8US19 22-2UA01) so that the clearance in air and creepage distance requirements are met.

Feeder/branch circuit according to UL 508A

The feeder circuit is that part of a circuit which comes in front of the last short circuit protection device (SCPD). The branch circuit is that part of the circuit which follows after the last short circuit protection device. When the 8US1 busbar system is used in a switchgear which must comply with UL directives, it is important to establish whether it is to be used in the feeder circuit or the branch circuit. Components used in the feeder circuit require larger clearance in air and creepage distances than in the branch circuit.

Simple Fast Bus system

The two illustrations above show the very basic items needed when setting up a Fastbus system.

- ① 8US1 Busbar holder (5/6)
- ② 8US1 Ground busbar support (shown attached however can be mounted separately 5/6)
- ③ Ground busbar available in 5 x 20 mm to 10 x 30 mm
- ④ 8WC Busbar (8WC5053 shown) FBB36 Busbar (5/6)

Short-circuit strength

The short-circuit strength of the busbar system is dependent on the spacing of the busbar holders and on the busbar cross-section.

The short-circuit strength of the whole system is dependent on the short-circuit strength of the busbar system and the components that are mounted to the system.

Applications

The 8US Fast Bus distribution system is ideal for control panel builders with multiple motor applications. These applications are most common in the material handling, automotive, food processing, pharmaceutical and paper processing industries.

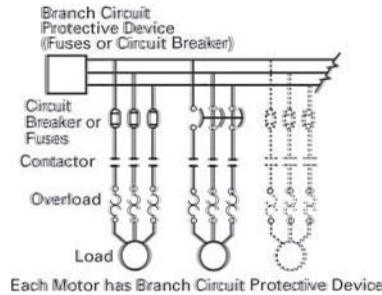
	Clearance in air	Creepage distance
Between live parts	25.4 mm (1 inch)	50.8 mm (2 inch)
Between live parts and grounded, non-insulated metal parts	25.4 mm (1 inch)	25.4 mm (1 inch)

Fast Bus combination starters and group installation assemblies

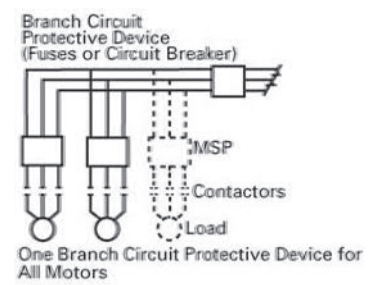
Ratings for Group Installations per NEC 430-53

Group Installation is an approach to building multiple motor control systems in accordance with Section 430-53 of the National Electrical Code. In Group installation, multiple motor starters can be grouped under one short circuit protective device. The 3RV MSP's have been UL listed for use in Group Installations both with and without 3RT contactors when mounted on the Fast Bus system. A 3RT contactor is added when remote operation of the motor is required.

Standard Installation, NEC 430-52



Group Installation, NEC 430-53



MSP Type	FLA Amp Range	FLA Amp Range	Maximum rating of Group Branch Circuit Protective Device		Short Circuit Current Ratings ^{1) 2)}		
			Fuse	Circuit Breaker	240V	480V	600V
3RV201	S00	0.11-12.5	The main fuse should be selected based on the FUSE selection procedure listed below.	The main CB should be selected based on the CIRCUIT BREAKER selection procedure listed below.	65kA	—	30kA
3RV201	S00	0.11-16			65kA	65kA	—
3RV202	S0	3.5-12.5			65kA	—	30kA
3RV202	S0	3.5-25			65kA	65kA	—
3RV202	S0	28-32			65kA	50kA	—
3RV202	S0	36-40			65kA	12kA	—
3RV103	S2	11-50			65kA	65kA	25kA
3RV104	S3	28-100			65kA	65kA	30kA

The selection of components for Group Installation is a simple process of the following three steps:

1. Selection of the Branch Circuit Protective Device, fuse or circuit breaker.
2. Selection of the 3RA Motor Starter based on the motor Full Load Amps.

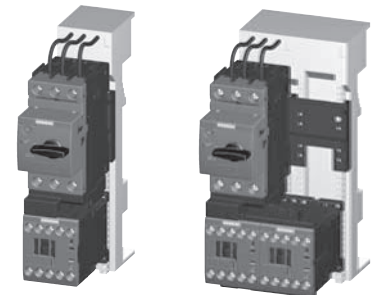
Circuit Breaker Selection

Select a circuit breaker (CB) between:
Minimum CB size (per NEC430-110):
Sum of all motor FLC (per NEC table 430-150) x 115%.
Maximum CB size (per NEC430-53c):
250% x FLC of the largest motor + FLC of all other motors.

Fuse Selection

Calculate the maximum fuse size per NEC430-53c.
Max Fuse Size = 175% x FLC of largest motor + FLC of all other motors (FLC's from NEC table 430-150).

Assembled Starter Type	Starter Frame Size	FLA Amp Range	Short Circuit Current Ratings (Type E) ¹⁾		
			240V	480Y/277V	600Y/347V
3RA201	S00	0.11-12.5	—	—	30kA
3RA201	S00	0.11-16	65kA	65kA	—
3RA202	S0	0.45-12.5	—	—	30kA
3RA202	S0	0.45-25	65kA	65kA	—
3RA202	S0	28-32	50kA	50kA	—
3RA103	S2	11-50	65kA	65kA	25kA
3RA104	S3	28-75	—	—	30kA
3RA104	S3	28-100	65kA	65kA	—



¹⁾ Branch Circuit Protective Device for 480V-Ratings: The appropriate BCPD need to be determined in accordance with the National Electrical Code, Article 430-53 and the application. The following devices are permitted:

Fuses: Classes RK1, RK5, J, G, T, CC or Circuit breakers: Listed Siemens type, with a marked short-circuit rating equal or larger than the available short-circuit current rating. These devices were tested for group installation use at the above levels without any upstream branch circuit device.

²⁾ 3RA2 used as Manual Motor Controller; Branch Circuit Protective Device for 600V-Ratings: Max. Class J 50A

³⁾ Starter sizes S00, S0 and S3 require additional type E line side terminal adaptors on the MSP for type F applications. See section 1 accessories

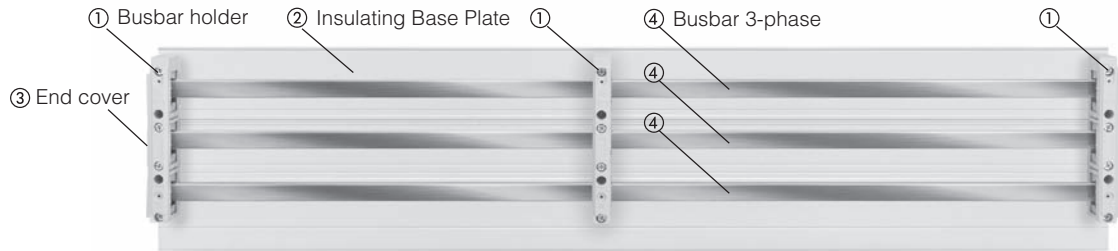
Fast Bus

Fast Bus Busbar Adapter System

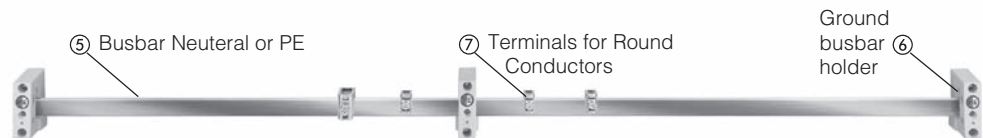
• Revised •
09/30/14










60 mm system

Selection and ordering data



- ① Busbar holder
- ② Insulating Base Plate
- ③ End cover
- ④ Busbar 3-phase
- ⑤ Busbar Neutral or PE
- ⑥ Ground busbar holder
- ⑦ Terminals for Round Conductors



	Description	UL Current rating	UL508A Compliance ¹⁾	Order No.	Pack Units
	Base plate ②				
8US1922-2UA01	3-pole system flat 230 mm x 1100 mm	—	required	8US19 22-2UA01	
	Copper Busbar with tin plating				
8WC5	20 mm x 5 mm x 914 mm (36") for 60 mm systems	362A	yes	FBB36	3 pcs
	20 mm x 5 mm x 1524 mm (60") for 60 mm systems	362A	yes	FBB60	3 pcs
	20 mm x 5 mm x 2000 mm (78.74") for 60 mm systems	362A	yes	8WC5053	
8US1948-2AA00	25 mm x 5 mm x 2000 mm (78.74") for 60 mm systems ⁴⁾	432A	yes	8WC5054	
	30 mm x 5 mm x 2000 mm (78.74") for 60 mm systems	500A	yes	8WC5055	
	20 mm x 10 mm x 2000 mm (78.74") for 60 mm systems	564A	yes	8WC5063	
	30 mm x 10 mm x 2000 mm (78.74") for 60 mm systems	756A	yes	8WC5065	
	720 mm ² x 2400 mm (94.49") Twin T (TT) Busbar	1400A	yes	8US19 48-2AA00	
	Busbar holder (end and intermediate) ①				
8US1922-1AC00	3-pole with inside mounting for 20 mm and 30 mm x 5 mm or 10 mm	—	yes	8US19 23-3UA01	
	3-pole with inside mounting for 25 mm x 5 mm or x 10 mm	—	—	8US19 23-3AA00	
8US1923-3UA01	3-pole with inside mounting for Twin T (TT) w/ end cover	—	yes	8US19 43-3AA01	
	Busbar holder end cover ③				
	3-pole end cover fits 8US19 23-3UA01 and 8US1923-3AA01		required	8US19 22-1AC00	
	Ground Busbar holder ⑥				
8US1923-1AA01	1-pole with inside mounting for 20 mm - 30 mm x 5 mm or 10 mm ²⁾		n/a	8US19 23-1AA01	
	Cover profiles for Busbars				
	for 5 mm busbars up to 30 mm wide 1000 mm length	—	required	8US19 22-2AA00	
	for 10 mm busbars up to 30 mm 1000 mm length	—	required	8US19 22-2BA00	
8US1922-2AA00	for Twin T (TT) busbar 1000 mm length	—	required	8US19 22-2DA00	
	Reserve Space Cover (for covering round terminals placed on 3-phase busbar)				
	Holder for reserve space cover 32mm height	—	required	8US1922-2EA00	4 pcs
	Holder for reserve space cover 107 mm height	—	required	8US1922-2EA01	8 pcs
8US1922-2EB00	Reserve space cover 195mm height / 700mm length	—	required	8US1922-2EB00	
	Feeder Lugs (mounts to all busbar sizes on this page)				
5SH3538	3-pole terminal plate with cover 20 mm x 200 mm 16-4 AWG	80A	yes	5SH3538	
8US1921-1BA00	3-pole terminal plate with cover 54 mm x 200 mm 10-2/0 AWG	300A	yes	8US19 21-1BA00	
	3-pole terminal plate with cover 81 mm x 200 mm 2 AWG-250 MCM	440A	yes	8US19 21-1AA00	
	3-pole terminal plate with cover 180 mm x 200 mm 250-600 MCM	560A	yes	FBT600F	
	3-pole terminal plate 154 mm x 184 mm 300-600 MCM	560A	yes	8US19 41-2AA03	
	3-pole terminal plate 160 mm x 184 mm for flat bars up to 32 mm x 20 mm	800A	yes	8US19 41-2AA04	
	Cover for 8US19 41-2AA03 and 04 180 mm x 200 mm x 90 mm	—	yes	8US19 22-1GC00	

1) UL 508A labeled panels require the use of components that meet the creepage and air distances of 1" air clearance and 2" creepage distance. N/A = not applicable for given item.

2) Current rating dependent on size of busbar used. Refer to busbar selection data.

Selection and ordering data

Description

FBCB Fast Bus circuit breakers

Offer a full range of feeder circuit breakers from 15A to 250A. All kits 125A and under are pre-assembled on 60 mm Fast Bus adaptor shoes and ready to place on the busbar. Circuit breakers

150A and higher are pre-packaged kits for fast user assembly and must be torqued down to the busbar prior to assembly. For VL breakers, adaptors are available for up to 500A breakers

(both main and feeder orientation).
See page 5/8.


1


2

3

4

5

				Available in 2014 ²⁾				
Design	UL Current Rating	Breaker Frame (SCCR Rating ¹⁾)						
Feeders Circuit Breakers		ED (25kA)	HHED (65kA)	FXD (35kA)	NGG (25kA)	HGG (35kA)	LGG (65kA)	
	3 pole/600V fully assembled breakers and adaptors that quickly snap onto the Busbar.	15A	FBCB015	—	—	FBCB015NGG	FBCB015HGG	FBCB015LGG
		20A	FBCB020	FBCB020H	—	FBCB020NGG	FBCB020HGG	FBCB020LGG
		25A	FBCB025	FBCB025H	—	FBCB025NGG	FBCB025HGG	FBCB025LGG
		30A	FBCB030	FBCB030H	—	FBCB030NGG	FBCB030HGG	FBCB030LGG
		35A	FBCB035	FBCB035H	—	FBCB035NGG	FBCB035HGG	FBCB035LGG
		40A	FBCB040	FBCB040H	—	FBCB040NGG	FBCB040HGG	FBCB040LGG
		45A	FBCB045	FBCB045H	—	FBCB045NGG	FBCB045HGG	FBCB045LGG
		50A	FBCB050	FBCB050H	—	FBCB050NGG	FBCB050HGG	FBCB050LGG
		60A	FBCB060	—	—	FBCB060NGG	FBCB060HGG	FBCB060LGG
		70A	FBCB070	—	—	FBCB070NGG	FBCB070HGG	FBCB070LGG
		80A	FBCB080	—	—	FBCB080NGG	FBCB080HGG	FBCB080LGG
		90A	FBCB090	—	—	FBCB090NGG	FBCB090HGG	FBCB090LGG
		100A	FBCB100	—	—	FBCB100NGG	FBCB100HGG	FBCB100LGG
		110A	FBCB110	—	—	FBCB110NGG	FBCB110HGG	FBCB110LGG
		125A	FBCB125	—	—	FBCB125NGG	FBCB125HGG	FBCB125LGG
	3 pole/600V kitted components for customer assembly that require the adaptor to be torqued down to the Busbars prior to assembly.	150A	—	—	FBCB150	—	—	—
		175A	—	—	FBCB175	—	—	—
		200A	—	—	FBCB200	—	—	—
		225A	—	—	FBCB225	—	—	—
		250A	—	—	FBCB250	—	—	—

Design	UL Current Rating	Breaker Frame (SCCR Rating)					
Main Circuit Breakers		FXD (25kA) ³⁾	HFXD (65kA)				
 <p>FBCB250M</p>	3 pole/600V kitted components for customer assembly that require the adaptor to be torqued down to the Busbars prior to assembly.	100A	FBCB100M	FBCB100M-HB	—	—	—
		125A	FBCB125M	FBCB125M-HB	—	—	—
		150A	FBCB150M	FBCB150M-HB	—	—	—
		175A	FBCB175M	FBCB175M-HB	—	—	—
		200A	FBCB200M	FBCB200M-HB	—	—	—
		225A	FBCB225M	FBCB225M-HB	—	—	—
		250A	FBCB250M	FBCB250M-HB	—	—	—

1) UL Short Circuit Current ratings are based on 480V. Contact Siemens for 600 V ratings.

2) Check Industry Mall for availability.






3) FBCB100M -125M SCCR = 25kA @ 480V
FBCB150M -250M SCCR = 65kA @ 480V

Fast Bus

Fast Bus Busbar Adapter System

60 mm system
Busbar adapters and device holders

Selection and ordering data










	Busbar device adapters	Number of mounting rails (35 mm)	Rated current	Connecting cables	Adapter length	Adapter width	Rated voltage UL	UL508A ¹⁾ compliance	Order No.	Pack units	Weight per PU approx .	
			A	AWG	mm	mm	V				kg	
	For SIRIUS								8US12 51-5DM07	100 units		
	Size S00/S0											
	MSP's	1	25	12	182	45	600	yes				0.183
	Contactors + Overload relays	1	25	12	182	45	600	yes				0.183
	Direct start load feeders	1	25	12	182	45	600	yes				0.183
	Reversing feeders											
	Busbar adapters	1	25	12	182	45	600	yes				0.183
	+ Device holders	1	--	--	182	45	600	yes	8US12 50-5AM00		0.158	
	+ Connecting plates	--	--	--	--	--	--	yes	8US19 98-1AA00		0.100	
	Size S00/S0 Cage Clamp								8US12 51-5CM47			
	Direct start load feeders	1	12	14	182	45	600	yes				0.190
	Size S2								8US12 61-5FM08 8US12 61-5FM08 8US12 61-5FP08 8US12 61-5FP08 8US12 60-5AM00 8US12 60-5AP00 8US19 98-1AA00	100 units		
	MSP's	1	50	8	182	55	600	yes				0.263
	Contactors + Overload relays	1	50	8	182	55	600	yes				0.263
	Direct start load feeders	1	50	8	245	55	600	yes				0.292
	Reversing feeders											
	Busbar adapters	1	50	8	242	55	600	yes				0.292
	Busbar adapters	1	--	--	242	55	600	yes				0.202
	+ Device holders	--	--	--	242	55	600	yes				0.243
	+ Connecting plates	--	--	--	--	--	--	yes				0.100
	Size S3											8US12 11-4TR00 FBS100723R FBS100722
	For VL UL circuit breakers ²⁾								8US12 13-4AQ03 8US12 13-4AQ03 8US12 13-4AH00 8US12 13-4AH00			
	VL150 UL, DG frame	--	150	Tubular contacts	190	105	600	yes				1.020
	VL250 UL, FG frame	--	250	Tubular contacts	190	105	600	yes				1.020
	VL400 UL, JG frame	--	400	Tubular contacts	296	140	600	yes				1.900
	VL400X UL, LG frame	--	540 ³⁾		296	140	600	yes				1.900
			Tubular	contacts								

¹⁾ UL 508A labeled panels require the use of components that meet the creepage and air distances of 1" air clearance and 2" creepage distance.
N/A = not applicable for given item.

²⁾ For use with 10mm x 30mm and twin T (TT) busbars only. Adaptors can be configured for main or feeder breakers applications.

³⁾ For use with maximum 500A circuit breaker. Circuit breakers greater than 500A must be panel mounted off the busbar system and fed to the busbars via an infeed module. See page 5/6.

Selection and ordering data

	Description	Max Amps	Width	UL508A Compliance ¹⁾	Order No.	List Price \$	Pack Units
Terminals for round conductors							
 Terminals	5 mm busbar thickness³⁾						
	12 mm x 5 mm	180		16 - 6 AWG	8US19 21-2AA00		100
	15 mm x 5 mm	270		12 - 2 AWG	8US19 21-2AB00		50
	20 mm x 5 mm	400		6 - 2/0 AWG	8US19 21-2AD00		50
	25 mm x 5 mm	440		6 - 250 MCM	8US19 21-2AC00		50
	30 mm x 5 mm	180		16 - 6 AWG	8US19 21-2AA01		15
		270		12 - 2 AWG	8US19 21-2AB01		15
		400		6 - 2/0 AWG	8US19 21-2AD01		15
		440		6 - 250 MCM	8US19 21-2AC01		15
	20 mm x 5 mm, 25 mm x 5 mm	500		3/0 - 350 MCM	8US19 41-2AA01		6
	30 mm x 5 mm	600		300 - 600 MCM	8US19 41-2AA02		3
 Terminals	10 mm bar thickness						
	12 mm x 10 mm ³⁾	180		16 - 6 AWG	8US19 21-2BA00		100
	15 mm x 10 mm ³⁾ , 20 mm x 10 mm	270		12 - 2 AWG	8US19 21-2BB00		50
	25 mm x 10 mm, 30 mm x 10 mm	400		6 - 2/0 AWG	8US19 21-2BD00		50
		440		6 - 250 MCM	8US19 21-2BC00		50
		180		16 - 6 AWG	8US19 21-2BA01		15
		270		12 - 2 AWG	8US19 21-2BB01		15
		400		6 - 2/0 AWG	8US19 21-2BD01		15
		440		6 - 250 MCM	8US19 21-2BC01		15
	20 mm x 10 mm, 25 mm x 10 mm	500		3/0 - 600 MCM	8US19 41-2AA01		6
	30 mm x 10 mm	600		300 - 600 MCM	8US19 41-2AA02		3
 8US19 22-1GA00	Terminal covers for circular conductors (mounts to busbars)						
	For terminals up to 250 MCM 200 mm long, 84 mm wide				8US19 22-1GA00		10
	For terminals up to 600 MCM 200 mm long, 270 mm wide				8US19 22-1GA02		1
	For terminals up to 600 MCM 200 mm long, 135 mm wide				FBC135		
Accessories for busbar adapters and device holders							
 Mounting Rail	Mounting rail (35 mm) - plastic complete with mounting screws	45 mm		n/a	8US1998-7CA15		10
		55 mm		n/a	8US1998-7CA16		10
		70 mm		n/a	8US1998-4AA00		10
		90 mm		n/a	8US1998-7CA08		10
		110 mm		n/a	8US1998-7CA10		10
 8US1998-1BA00	Connection holder (for vertical busbar assembly) fixes the MSP to the mounting rail ³⁾ (for SIRIUS sizes S00/S0)	-		n/a	8US1998-1DA00		20
	Screw holder for supplementary screw fixing of the feeder (for SIRIUS sizes S00/S0)	-		n/a	8US1998-1CA00		20
 FBC20	Spacer fixes the busbar adapter to the device holder (for SIRIUS sizes S00/S0)	-		n/a	8US1998-1BA00		100
		-		n/a	8US1998-1BA01		1
 Load Side Terminal	Connection wedges for mechanical linking of adapters and switching device holders (2 units required per combination)	-		n/a	FBC20		20
Outgoing terminal rail for busbar adapters							
 8US1998-2BM00	Plug-type terminal (complete with supporting element for attaching to busbar adapter and switching device holder. Spring loaded terminals.)						
	3 x 14 AWG (400 V) and 4 x 16AWG (250 V)	91 mm	45 mm	n/a	8US1998-8AM07		
	7 x 14 AWG (400 V)	91 mm	54 mm	n/a	8US1998-8AA10		
Accessories for busbar adapters and device holders							
 8US1998-2BM00	Side module for busbar adapter expansion For adapters w/182 mm	182 mm	10 mm	n/a	8US1998-2BM00		
	Side module for busbar adapter expansion For adapters w/200 mm	200 mm	9 mm	n/a	8US1998-2BJ10		

¹⁾ UL508A labeled panels require the use of components that meet the creepage and air distances of 1" air clearance and 2" creepage distance.

N/A = not applicable for given item.

²⁾ Terminals must be manually spaced on the busbar to comply with UL508A distances of 1" air clearance and 2" creepage distance.

³⁾ Cannot be used on Twin T (TT) profile up to 1400 A.

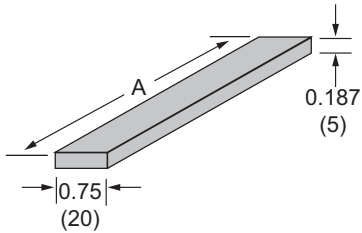
Fast Bus

Fast Bus Busbar Adapter System

60 mm system

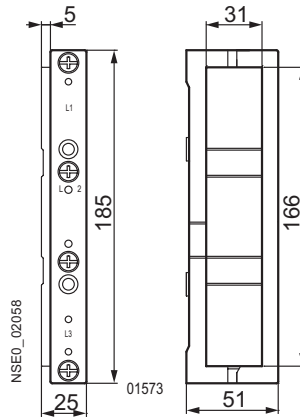
Dimension drawings

FBF36/FBF60 Copper Busbar

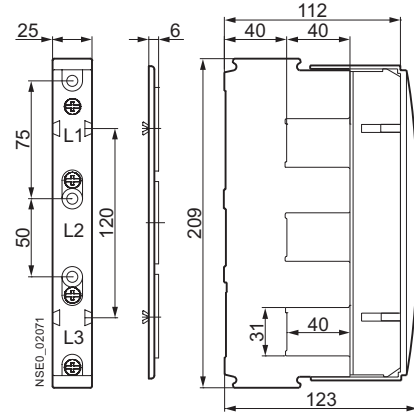


Dimension	A
FBF36	36 (914)
FBF60	60 (1524)

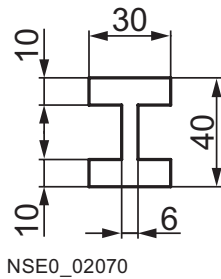
8US19 23-3UA01



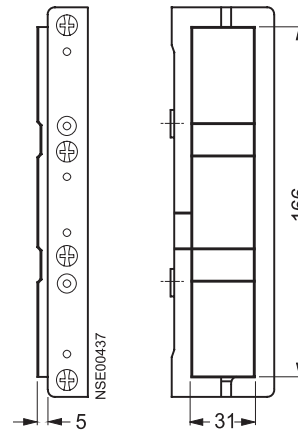
8US19 43-3AA00



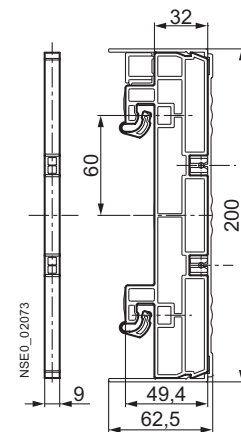
Copper Busbar/TT profile, 8US19 48-2AA00



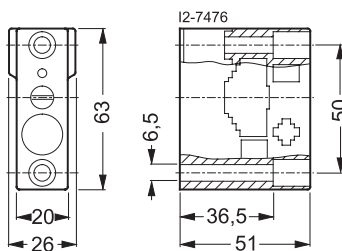
8US19 22-1AC00 with 8US19 23-3UA01
8US19 22-1AC00 with 8US19 23-3AA01



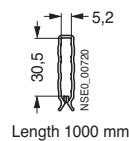
Support for blanking covers,
8US1922-2EA00



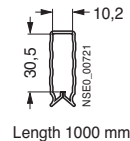
8US19 23-1AA01



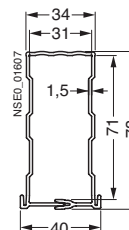
8US19 22-2AA00



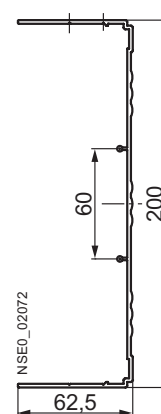
8US19 22-2BA00



8US19 22-2DA00

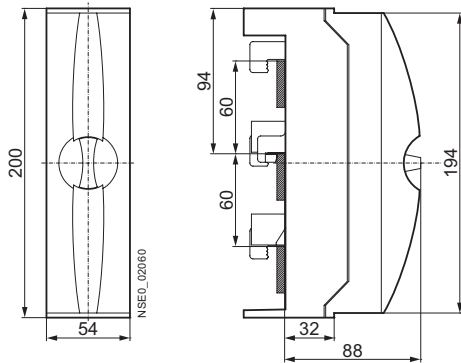


Blanking cover, 8US1922-2EB00

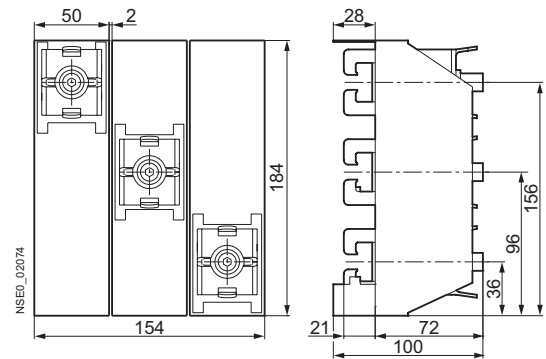


Dimension drawings

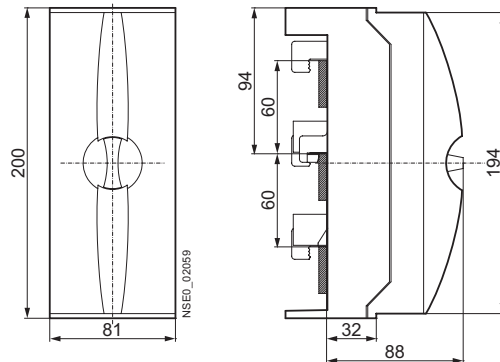
Infeed, 8US19 21-1BA00



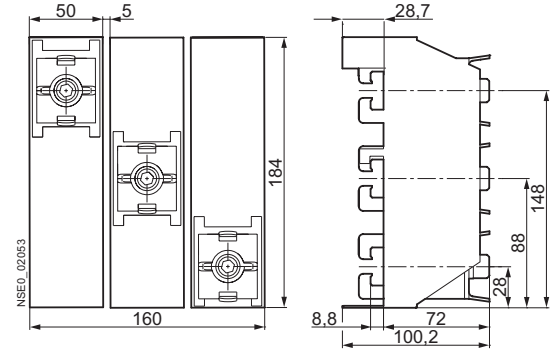
Infeed, 8US19 41-2AA03



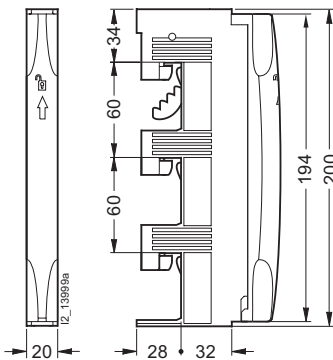
Infeed, 8US19 21-1AA00



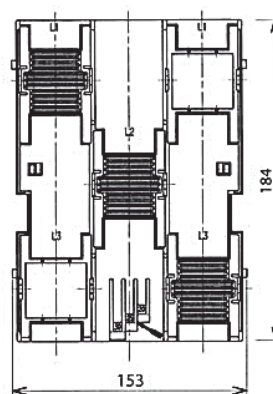
Infeed, 8US19 41-2AA04



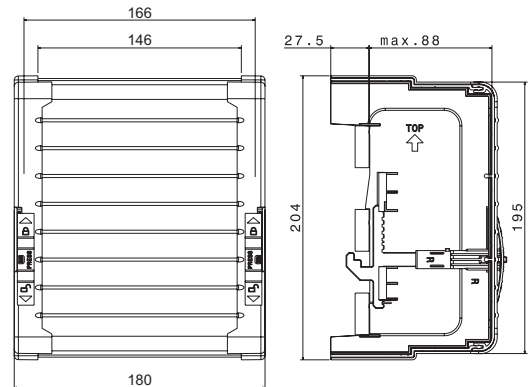
Infeed 5SH3538



FBT600F (supplied with cover)



FBT600F Cover



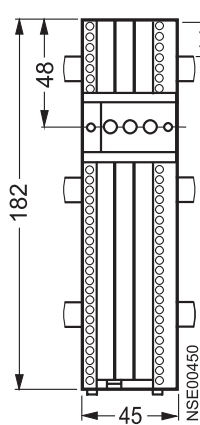
Fast Bus

Fast Bus Busbar Adapter System

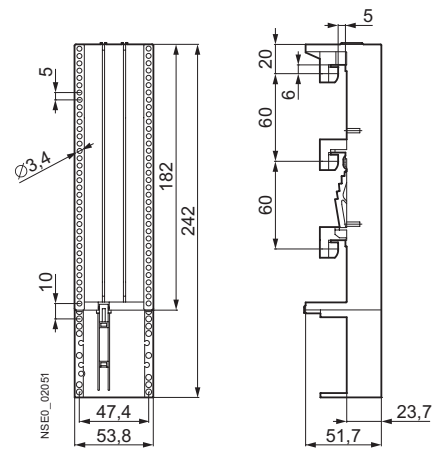
60 mm system

Dimension drawings

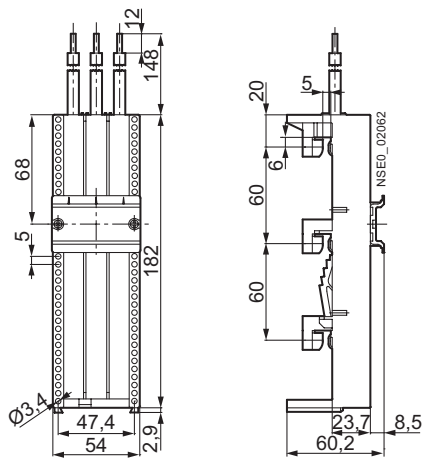
Busbar device adapter, 8US12 50-5AM00



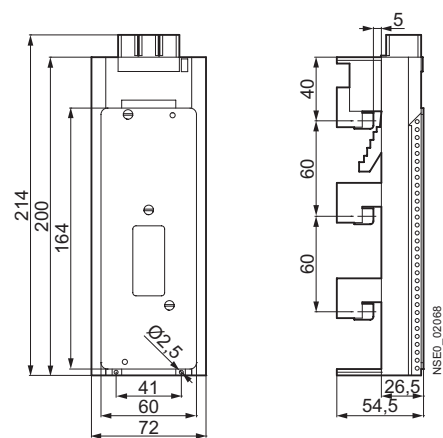
Busbar device adapter, 8US12 60-5AP00



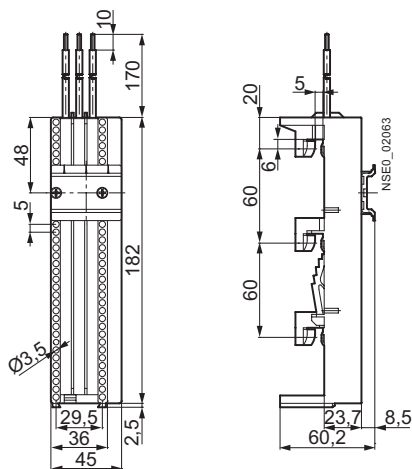
Busbar device adapter, 8US12 61-5FM08



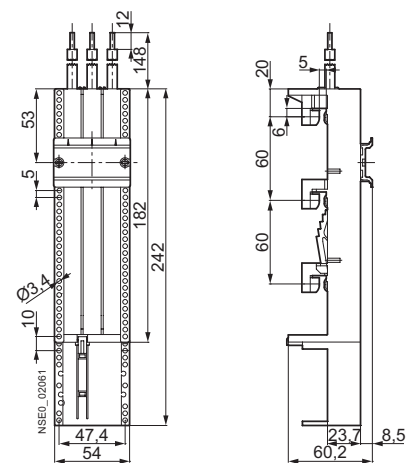
Busbar device adapter, 8US12 11-4TR00



Busbar device adapter, 8US12 51-5DM07

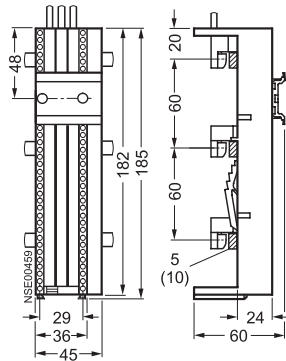


Busbar device adapter, 8US12 61-5FP08

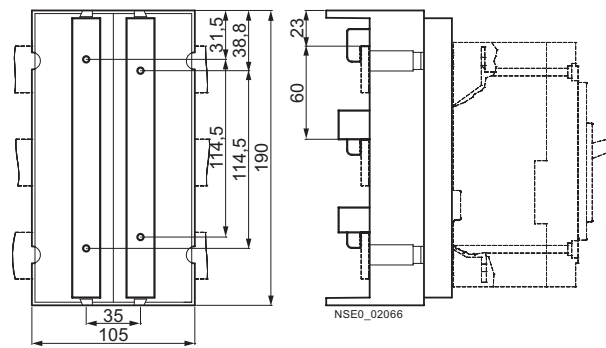


Dimension drawings

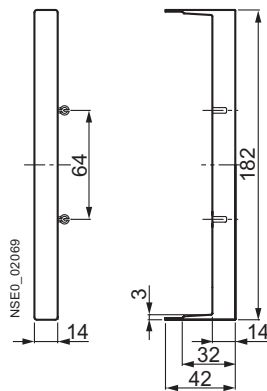
Busbar device adapter, 8US12 51-5CM47



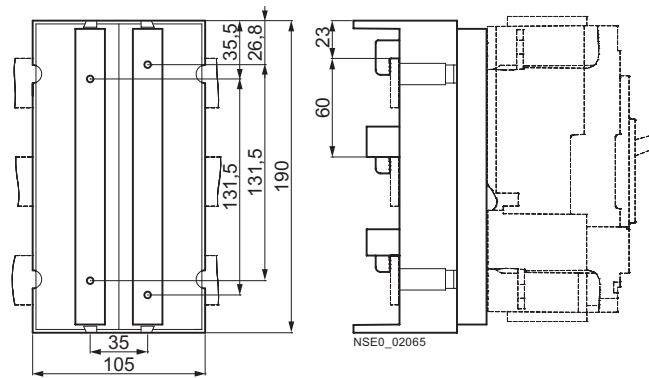
Busbar device adapter, 8US12 13-4AQ01



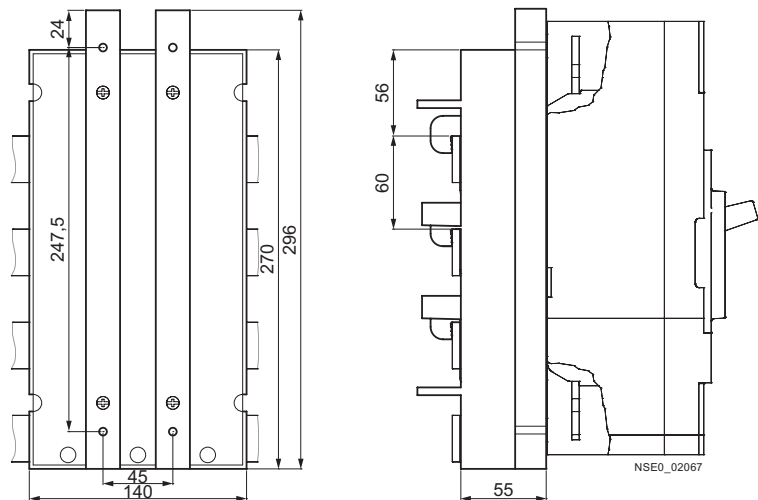
8US19 98-2BM00



Busbar device adapter, 8US12 13-4AQ03



Busbar device adapter, 8US12 13-4AH00



Fast Bus

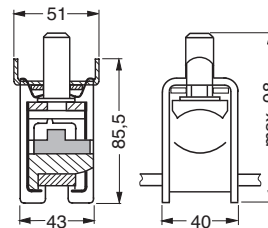
Fast Bus Busbar Adapter System

60 mm system

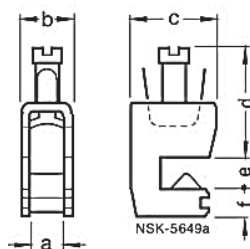
Dimension drawings

	Type	a	b	c	d	e	f	Max tightening torque
5mm	8US1921-2AA0.	7.5	11.5	22.5	25	5	10	4 Nm
	8US1921-2AB0.	10.5	15.5	29	35	5	10	6 Nm
	8US1921-2AC0.	17	23.5	36	55	5	12	15 Nm
	8US1921-2AD0.	14.5	20.5	32	42	5	12	10 Nm
10mm	8US1921-2BA0.	7.5	11.5	22.5	25	10	10	4 Nm
	8US1921-2BB0.	10.5	15.5	29	35	10	10	6 Nm
	8US1921-2BC0.	17	23.5	36	55	10	12	15 Nm
	8US1921-2BD0.	14.5	20.5	32	42	10	12	10 Nm

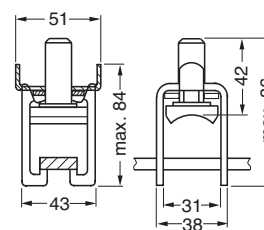
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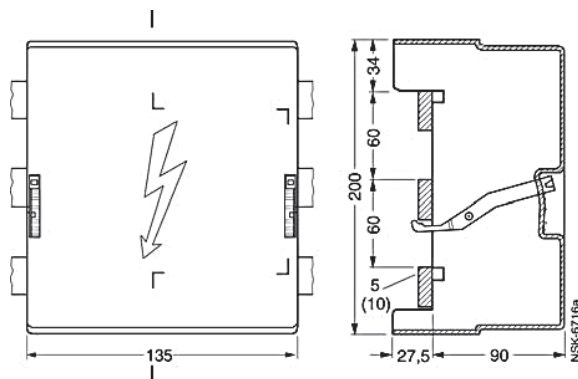
8US1921-2A / -2B



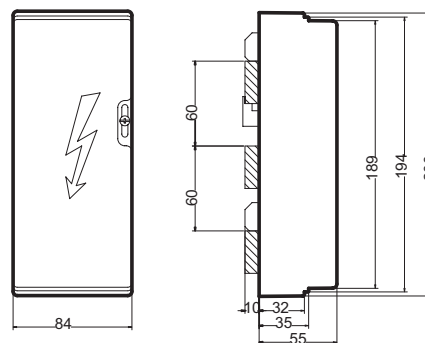
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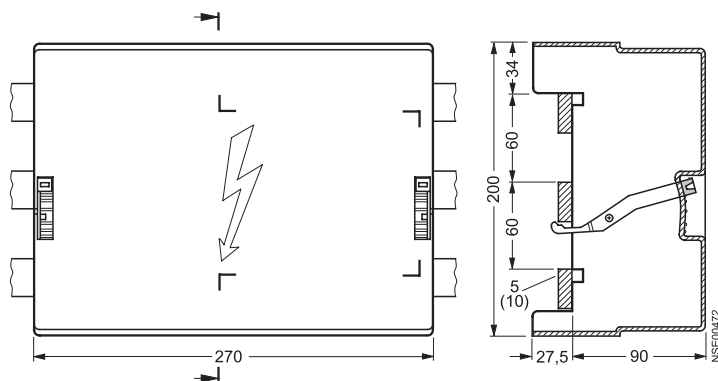
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8US1922-1GA00

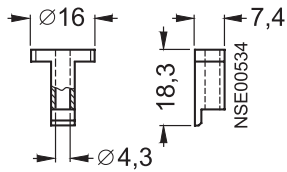


8US19 22-1GA02

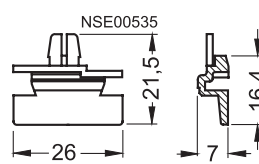


Dimension drawings

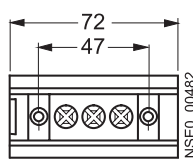
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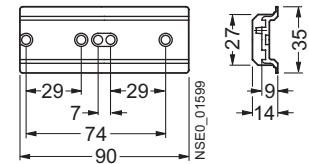
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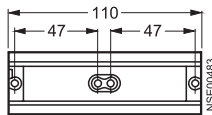
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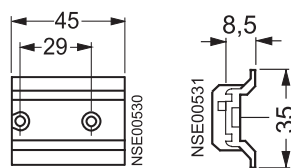
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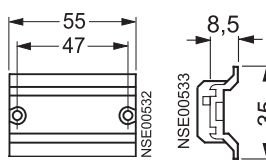
8US19 98-7CA10



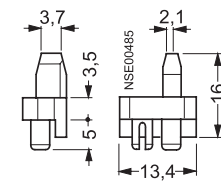
8US19 98-7CA15



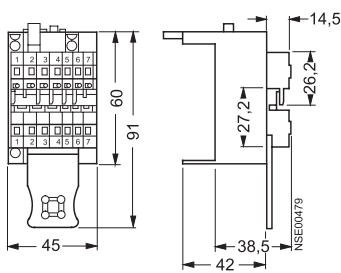
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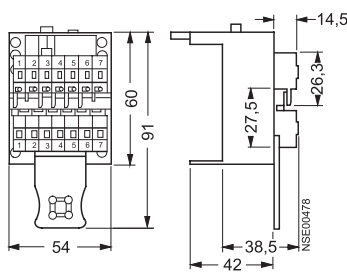
8US19 98-1BA00



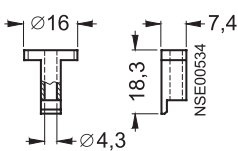
8US19 98-8AM07



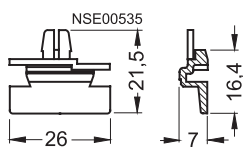
8US19 98-8AA10



8US19 98-1CA00



8US19 98-1DA00



Fast Bus

SIRIUS 3RA Fast Bus Combination Starters and Group Installation Assemblies

General data

Order No. scheme

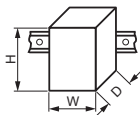
Digit of the Order No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th
	□□□	□	□	□	0	-	□	□	□	□	-	□	□	□
SIRIUS starters	3 R A													
SIRIUS 2nd generation	2													
Type of starter (direct-on-line starter = 1, reversing starter = 2)	□													
Size (S00 = 1, S0 = 2)	□													
Setting range for overload release	□ □													
Design type and connection method	□													
Rated power at 460 V AC	□ □													
Integrated auxiliary switches of the contactor	□													
Operating range / solenoid coil circuit (contactor)	□													
Rated control supply voltage (contactor)	□ □													
Example	3 R A	2	1	1	0	-	0	B	A	1	5	-	1	A K 6

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers. For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Technical specifications

Direct-on-line starters/ reversing starters	Size	Connection methods	Mounting	Control voltage	Width W	Height H	Depth D
					mm	mm	mm
Mounting dimensions							
Direct-on-line starters 3RA21.	S00	Screw terminals	Standard mounting rails	AC/DC	45	167	97
			Busbar adapters	AC/DC	45	200	155
		Spring-type terminals	Standard mounting rails	AC/DC	45	198	97
			Busbar adapters	AC/DC	45	260	155
	S0	Screw terminals	Standard mounting rails	AC	45	193	97
			Busbar adapters	DC	45	193	107
		Spring-type terminals	Standard mounting rails	AC/DC	45	243	107
			Busbar adapters	AC/DC	45	260	165
Reversing starters 3RA22.	S00	Screw terminals	Standard mounting rails	AC/DC	90	170	97
			Busbar adapters	AC/DC	90	200	155
		Spring-type terminals	Standard mounting rails	AC/DC	90	204	97
			Busbar adapters	AC/DC	90	260	155
	S0	Screw terminals	Standard mounting rail adapters	AC	90	265	120.3
			Busbar adapters	DC	90	265	130
			Busbar adapters	AC	90	260	155
			Busbar adapters	DC	90	260	165
		Spring-type terminals	Standard mounting rail adapters	AC/DC	90	270	131
			Busbar adapters	AC/DC	90	260	165
			Busbar adapters	AC/DC	90	260	165
			Busbar adapters	AC/DC	90	260	165



Type		3RA2. 1	3RA2. 2
Size		S00	S0
Number of poles		3	3
Mechanics and environment			
Permissible ambient temperature			
• During operation	°C	-20 ... +60	
• Storage and transport	°C	-55 ... +80	
Weight	kg	0.6 ... 1.5	0.8 ... 2.3
Permissible mounting positions			
		Important: Acc. to DIN 43602 start command "I" at the right or top	
Shock resistance (sine-wave pulse)	Acc. to IEC 60086 Part 2-27	g	Up to 6
Degree of protection	Acc. to IEC 60947-1	IP20	

Combination Starters & Starters for Group Installation

SIRIUS 3RA Motor Starters

General data

1

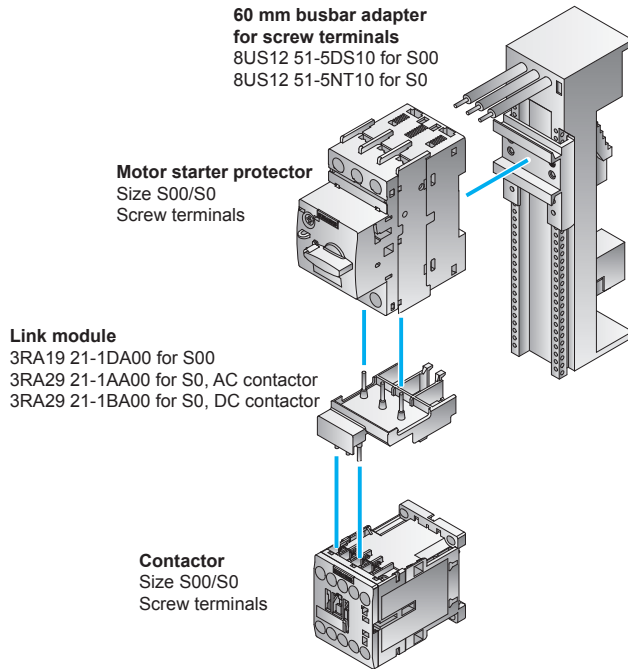
2

3

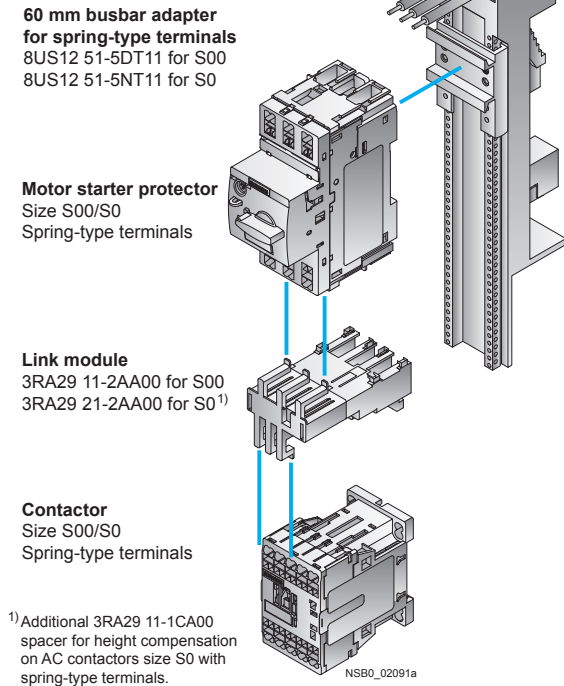
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5

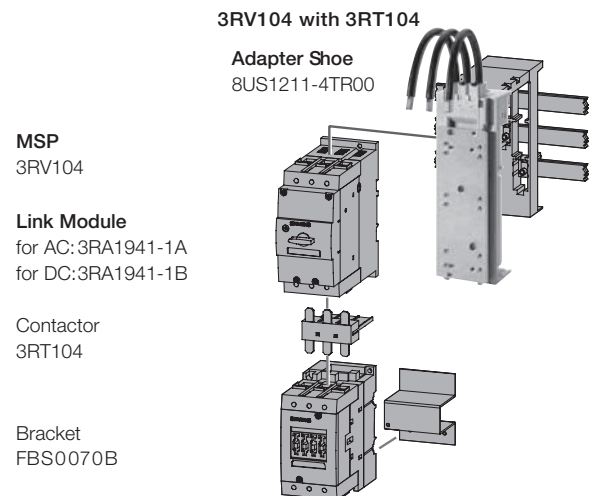
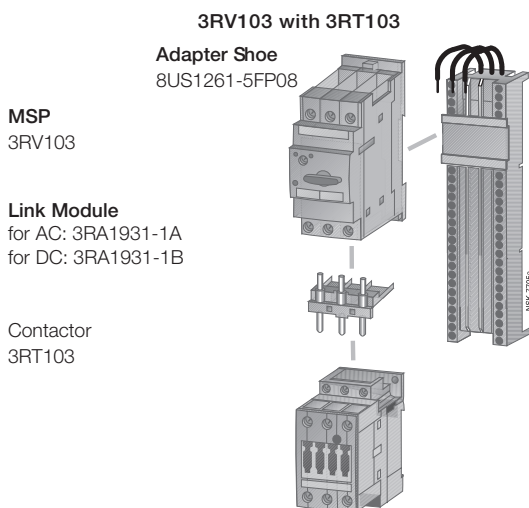
Direct-on-line starting • For 60 mm busbar systems • Sizes S00 and S0



Left: 3RA21 motor starter for direct-on-line starting with busbar adapters with screw connection



Right: 3RA21 motor starter for direct-on-line starting with busbar adapters with spring-type connection



Fast Bus

SIRIUS 3RA Fast Bus Combination Starters and Group Installation Assemblies

Selection

Reversing duty • For 60 mm busbar systems • Sizes S00 and S0

RS assembly kit for reversing duty and busbar mounting

Screw connection:

3RA29 13-1DB1 for S00

3RA29 23-1DB1 for S0

For spring-type connection:

3RA29 13-1DB2 for S00

3RA29 23-1DB2 for S0¹⁾

Comprising:

- 1 wiring kit
- 1 busbar adapter
- 1 device holder
- 2 connecting wedges

¹⁾ Also includes 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

Motor starter protector

Size S00/S0

Screw terminals/
spring-type terminals

Link module

For screw terminals:

3RA19 21-1DA00 for S00

3RA29 21-1AA00 for S0, AC contactor

3RA29 21-1BA00 for S0, DC contactor

For spring-type terminals:

3RA29 11-2AA00 for S00

3RA29 21-2AA00 for S0²⁾

60 mm busbar adapter

For screw terminals:

8US12 51-5DS10 for S00

8US12 51-5NT10 for S0

For spring-type terminals:

8US12 51-5DT11 for S00

8US12 51-5NT11 for S0

2 connecting wedges
8US19 98-1AA00

60 mm device holder
8US12 51-5AS10

2 contactors

Size S00/S0

Screw terminals/
spring-type terminals

Wiring kit

Screw connection:

3RA29 13-2AA1 for S00

3RA29 23-2AA1 for S0

Spring-type connection:

3RA29 13-2AA2 for S00

3RA29 23-2AA2 for S0

① Upper wiring module

② Lower wiring module

③ 2 connecting clips

④ Mechanical interlock
(can be removed if necessary)

²⁾ Additional 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

3RA22 motor starter for reversing duty and 60 mm standard mounting rail in size S00/S0 (the version with screw connection is shown in the picture)

Fast Bus

SIRIUS 3RA Fast Bus Combination Starters and Group Installation Assemblies

Selection

1

2

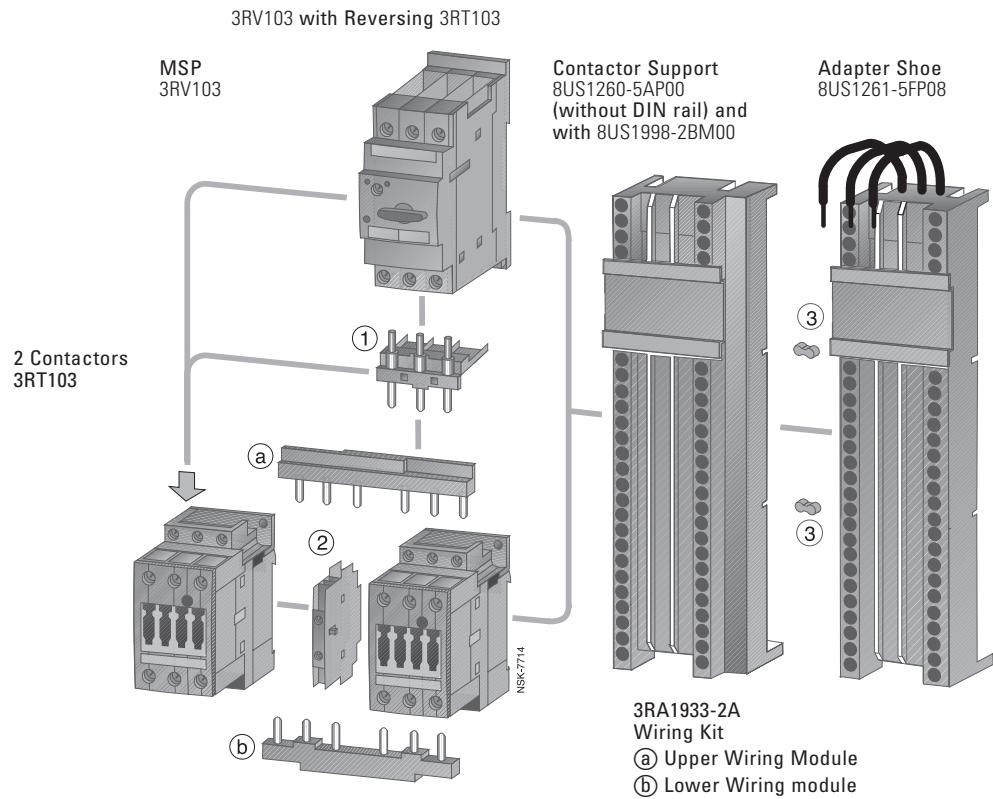
3

4

5

Required Components for Fast Bus Mounting

- ① Link Module
for AC: 3RA1931-1A
for DC: 3RA1931-1B
- ② Mechanical Interlock
3RA1924-2B
- ③ Fast Clips
FBC20

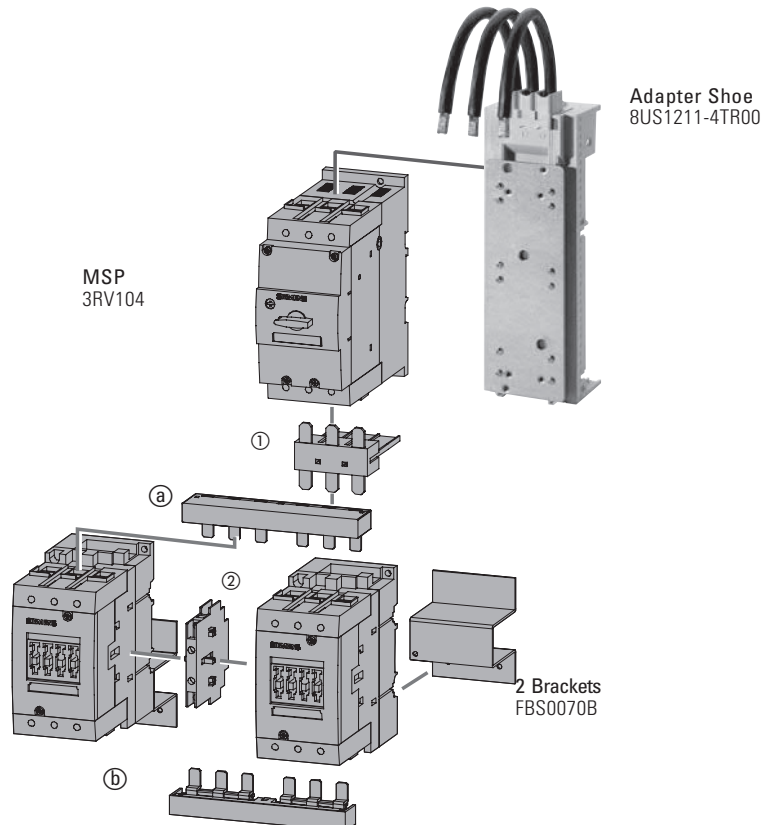


3RV104 with Reversing 3RT104

- ① Link Module
for AC: 3RA1941-1A
for DC: 3RA1941-1B
- ② Mechanical Interlock
3RA1924-2B

3RA1943-2A
Wiring Kit
a Upper Wiring Module
b Lower Wiring Module

2 Contactors
3RT104



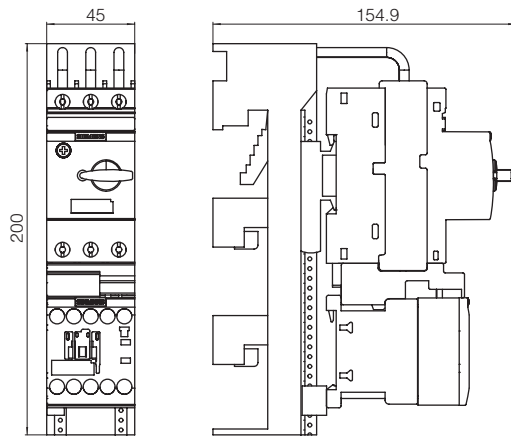
Fast Bus

SIRIUS 3RA Fast Bus Combination Starters and Group Installation Assemblies

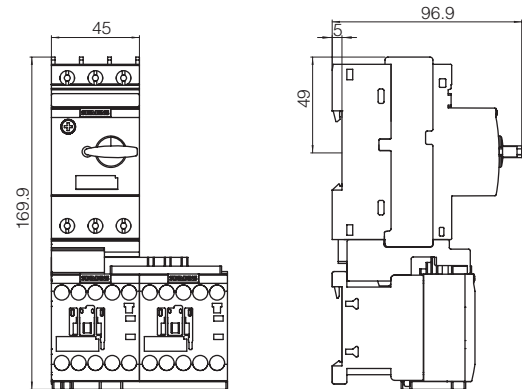
Dimensions

Dimensions, 3RV101 with 3RT101

3RA2110
Fast Bus Non-reversing



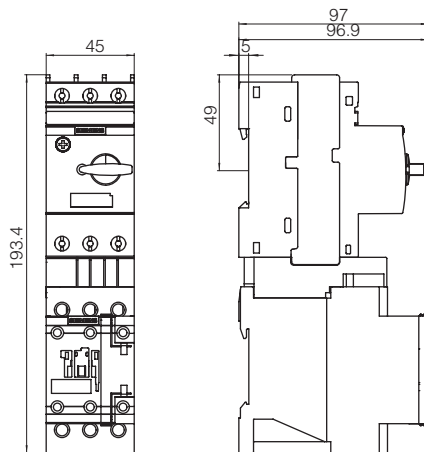
3RA2210
Fast Bus Reversing



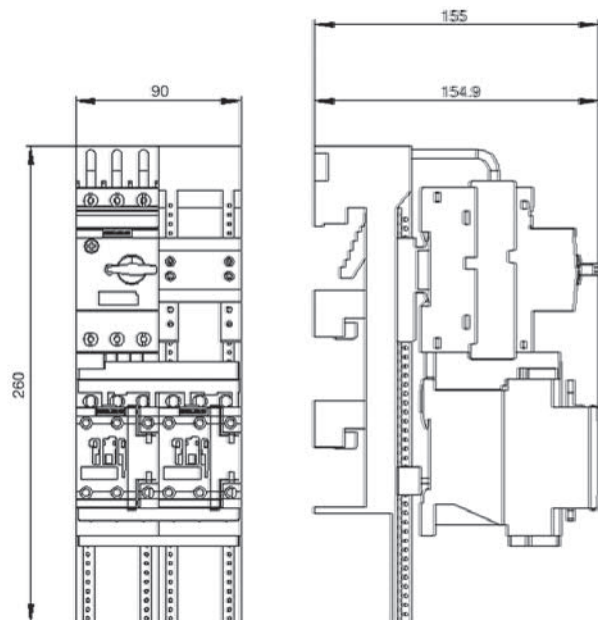
- 1) Lockable in OFF position. Padlock diameter 5 mm.
- 2) When a front auxiliary is installed on the contactor, add 44 mm to the depth of the contactor.

Dimensions, 3RV102 with 3RT101

3RA2120
Fast Bus Non-reversing



3RA2220
Fast Bus Reversing

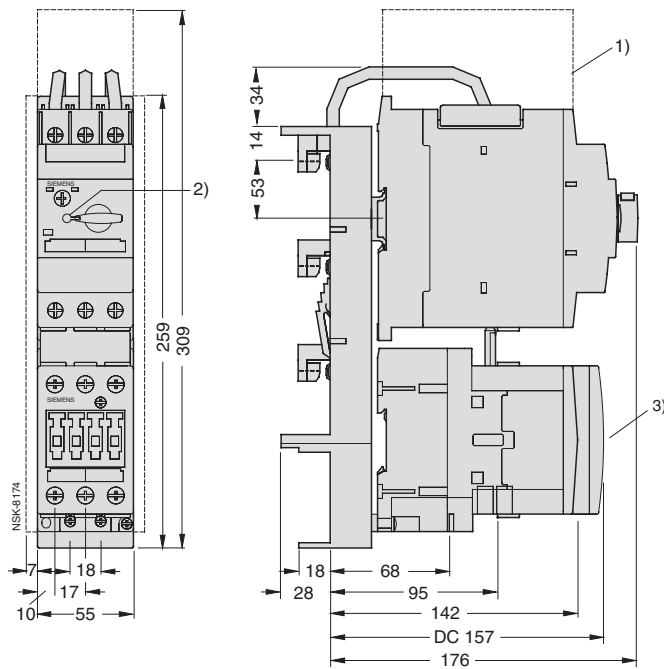


- 1) Lockable in OFF position. Padlock diameter 5 mm.
- 2) When a front mount auxiliary is installed on the contactor, add 44 mm to the depth of the contactor.

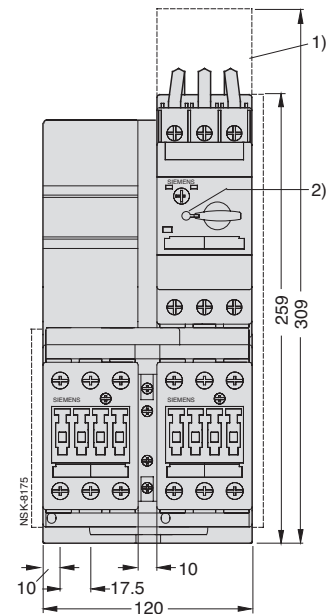
All dimensions shown in millimeters. For reference purposes only. Not to be used for design or construction purposes.

3RV103 with 3RT103

3RA1130
Fast Bus Non-reversing



3RA1230
Fast Bus Reversing



Lateral clearance to grounded components minimum 6 mm.

1) Arcing space

2) Lockable in OFF position with padlock diameter 5 mm.

3) When a front mount auxiliary is installed on the contactor, add 49 mm to the depth of the contactor.

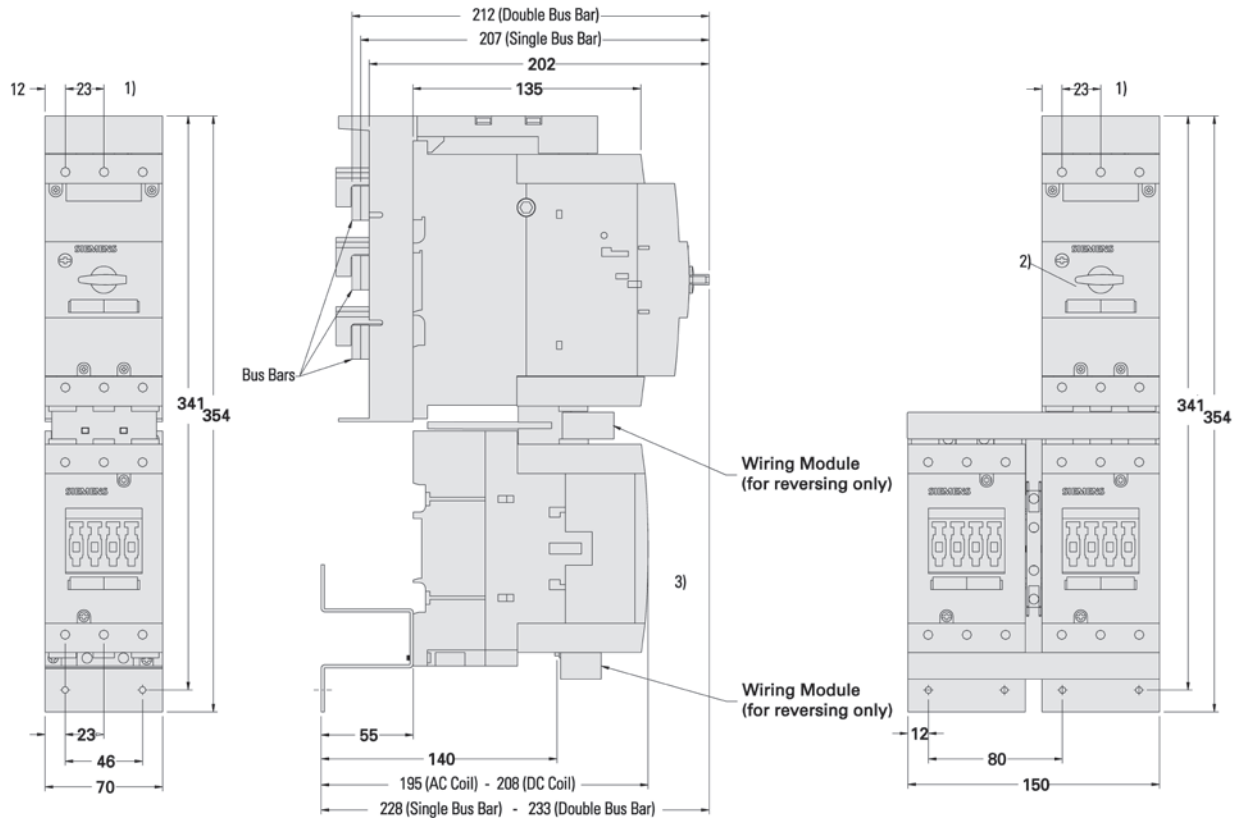
All dimensions shown in millimeters. For reference purposes only. Not to be used for design or construction purposes.

Fast Bus

SIRIUS 3RA Fast Bus Combination Starters and Group Installation Assemblies

Dimensions

3RV104 with 3RT104



Lateral clearance to grounded components minimum 6 mm.

- 1) Arcing space
- 2) Lockable in OFF position with padlock diameter 5 mm.
- 3) When a front mount auxiliary is installed on the contactor, add 49 mm to the depth of the contactor.

All dimensions shown in millimeters. For reference purposes only. Not to be used for design or construction purposes.



Contents

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3RM1 Compact - Hybrid Starters

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General Data	6/3
Selection and ordering data	6/4
Accessories	6/5 - 6/9
Technical Data	6/9 - 6/10



Overview

Overview



3RM12 motor starter with reversing functionality and electronic overload protection

SIRIUS 3RM1 motor starters are compact devices with a width of 22.5 mm, combining a large number of functions in a single enclosure. They consist of combinations of relay contacts, power semiconductors (hybrid technology), and a solid-state overload relay for operational switching of three-phase motors up to 3 HP (at 480 V).

Feature	Value
Rated current (wide setting range of the electronic overload release)	0.1 ... 0.5 A 0.4 ... 2.0 A 1.6 ... 7.0 A (UL=6.1A)
Rated operational voltage	48 ... 500 V
Rated frequency	50/60 Hz
Rated control supply voltage	24 V DC, 110 V DC, 110 ... 230 V AC
Trip class	CLASS 10A

The 3RM1 motor starters with overload protection with wide setting range are offered as 3RM10 direct-on-line starters and 3RM12 reversing starters and as versions with safety-related shutdown.

Characteristic	3RM10	3RM11	3RM12	3RM13
Direct-on-line starters	✓	✓	--	--
Reversing starters	--	--	✓	✓
Overload protection with wide setting range	✓	✓	✓	✓
ATEX certification overload protection	--	✓	--	✓
Safety-related shutdown up to SIL 3 / PLe	--	✓	--	✓

Hybrid technology

The 3RM1 motor starters combine the benefits of semiconductor technology and relay technology. This combination is also known as hybrid technology. The hybrid technology in the motor starter is characterized by the following features:

- The inrush current is conducted briefly via the semiconductors.
Advantage: protection of relay contacts, long service life due to low wear
- The continuous current is conducted via relay contacts.
Advantage: lower heat losses compared with the semiconductor.
- Shutdown is implemented again via the semiconductor.
Advantage: the contacts are only slightly exposed to arcs, and this results in a longer service life.

Functional density/space savings

The 3RM1 motor starters combine the functions direct/reversing starting and overload protection and safety-related shutdown in a single device, without changing the 22.5mm width.

For simple applications (such as starting and reversing three-phase loads with overload protection), motor starter combinations of power contactors and a solid-state overload relay, for example, can be replaced by a single 3RM1 starter. The more functions are required, the more devices can be replaced. The footprint area required for each motor starter in the control cabinet is reduced by values of 64 to 82%.

In the case of assemblies and grouped starter units there are further advantages.

Wiring overhead

By combining various functions in a single device, wiring overhead is reduced. The greater the number of starters, the greater the saving in wiring. Savings can be made in:

- mains wiring and space reduction with the use of the 3RM19 three phase infeed system
- wiring of the reversing contactor assembly thanks to the integrated design
- reduction of control cables for the coils in group applications with the 3ZY12 device connectors

These savings reduce the time required for the wiring itself, while at the same time reducing both the risk of wiring errors and the amount of testing required after control cabinets have been completed.

Configuration and inventory

The wide setting range of the electronic overload release (up to 1:5) reduces the cost of inventory and the considerations involved in configuration where the actual motor current to be expected is concerned. Compared with protection equipment with thermal overload protection, only 3 versions are now required to cover a current range of 0.1 to 7 A with 3RM1, instead of 17 versions.

Connection methods

The 3RM1 is available with screw terminal, push-in terminals or a combination of both..

Push-in terminals are a form of spring-type connection allowing fast wiring without tools for rigid conductors or conductors equipped with end sleeves.

Fine-stranded or stranded conductors with no end finishing are wired using a screwdriver (with a 3.0 x 0.5 mm blade).

As with other spring-type terminals, a screwdriver is also required to release the conductor. The same tool as above can be used for this purpose.

The advantages of the push-in terminals are found, as with all spring-type terminals, in speed of assembly and disassembly and vibration-proof connection. There is no need for the checking and tightening required with screw terminals.



Screw terminals



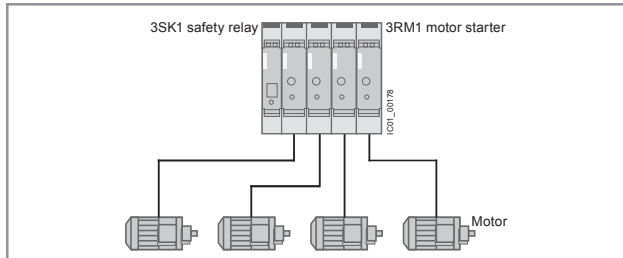
Spring-type terminals

The terminals are indicated in the corresponding tables by the symbols shown on blue backgrounds.



Safety-related shutdown/safety integration

Thanks to the redundant design of the main circuit and internal monitoring, safety-related shutdown in accordance with SIL 3 / PLe is possible by shutting down the control supply voltage with 3RM11 Failsafe and 3RM13 Failsafe motor starters. Additional safety relays are not required in the main circuit.



Combination of four SIRIUS 3RM1 Failsafe motor starters with SIRIUS 3SK1 safety relay to allow safety-related collective disconnection of connected motors

3RM1 motor starters are ideal for combining with the 3SK1 safety relay (see Chapter 13 "Safety Technology" → SIRIUS 3SK1 Safety Relays). They can be combined by means of:

- conventional wiring
- a special device connector

This makes it very simple to shut down connected motors collectively. The wiring, and ultimately the shutting down of the control supply voltage in Emergency Stop situations, is performed via the device connector. There is no further need for complex looping of the connecting cables.

Feedback to the control system

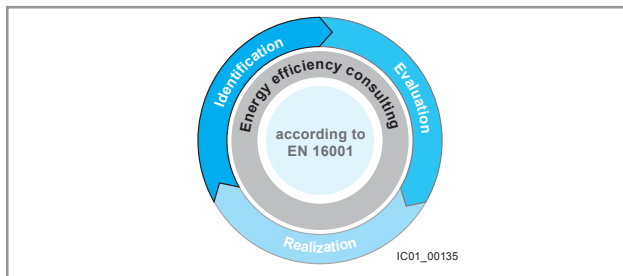
The electronic output in the 24 V DC control voltage version of the 3RM10 and 3RM12 motor starters allows the status of the connected motor to be reported to the higher-level control system. If the motor starter is controlled via inputs IN1 to 2, once the motor has been switched on and has started up correctly the output "OUT" is set.

Infeed system for the main circuit

The 3RM19 infeed system available as an accessory for the main circuit with three-phase busbars allows fast, virtually error-free wiring of motor starters on the mains connection side and may reduce the number of short-circuit protective devices.

Benefits

Advantages through energy efficiency



Overview of the energy management process

We offer you a unique portfolio for efficient industrial energy management, using an energy management system that helps to optimally define your energy needs. We split up our industrial energy management into three phases – identify, evaluate, and realize – and we support you with the appropriate hardware and software solutions in every process phase.

The innovative products of the SIRIUS Industrial Controls portfolio can also make a substantial contribution to a plant's energy efficiency (see www.siemens.com/sirius/energysaving).

With 3RM1 motor starters, control cabinets warm up less because power losses have been reduced by operation:

- Lower intrinsic power loss (than comparable motor starters with thermal overload trips) thanks to electronic current analysis
- Lower control circuit power losses (compared with conventional switching devices) as a result of electronic control of switching points
- Thanks to the above advantages, additional energy savings are possible because less cooling is required and a more compact design is possible

Product advantages

The SIRIUS 3RM1 motor starters offer a number of benefits:

- Greater endurance and reduced heat losses thanks to hybrid technology
- Less space required in the control cabinet (64 to 82%) as a result of higher functional density
- Less wiring and testing required as a result of integrating several functions into a single device
- Lower costs for stock keeping and configuration as a result of the wide setting range of the electronic overload release (up to 1:5)
- Fast wiring without tools for rigid conductors or conductors equipped with end sleeves thanks to push-in spring-type connections
- Motor status feedback to the higher-level control system in the case of 3RM10 and 3RM12 motor starters in the 24 V DC version
- Virtually error-free wiring on the mains connection side and reduction in short-circuit protective devices by means of 3RM19 comb busbar and infeed system

Compact – Hybrid Starters

Hybrid Starters

3RM1 up to 3HP

• Revised •
09/30/14



Selection and ordering data

- Direct and reversing starters in 22.5mm width
- Electronic overload protection — class 10
- Coil voltages 24VDC, 110-230VAC and 110VDC
- Screw Terminals or Spring Loaded Terminals
- Group Installation possible with fuse or UL489 breaker
- SCCR up to 100kA with J fuses
- Comb busbar accessories for easy group assembly
- Removeable terminals



3RM1007-1AA04 3RM1207-2AA04 3RM110.-1AA.4 3RM130.-1AA.4

3RM10 motor starter for direct-on-line starting with electronic overload protection

with

UL ratings at 480VAC		Amp ratings		Single-phase HP ratings ①			Three-phase HP ratings ①			Signaling contacts		All Screw Terminals	All Spring Loaded Terminals	Mixed ② Spring Loaded & Screw Terminals
FLA	LRA	AC53	AC51	115V	200V	230V	200V	230V	460V	NO	NC	Order No.	Order No.	Order No.
Rated control supply voltage $U_s = 24$ VDC														
0.5	3.5	0.5	—	—	—	—	—	—	—	1	1	3RM1□01-1AA04	3RM1□01-2AA04	3RM1□01-3AA04
2	14	2	—	—	—	1/8	1/8	1/8	3/4	1	1	3RM1□02-1AA04	3RM1□02-2AA04	3RM1□02-3AA04
6.1	43	7	10	1/4	1/2	1/2	1	1 1/2	3	1	1	3RM1□07-1AA04	3RM1□07-2AA04	3RM1□07-3AA04
Rated control supply voltage $U_s = 110-230$ VAC 50/60 Hz and 110 VDC														
0.5	3.5	0.5	—	—	—	—	—	—	—	1	1	3RM1□01-1AA14	3RM1□01-2AA14	3RM1□01-3AA14
2	14	2	—	—	—	1/8	1/8	1/8	3/4	1	1	3RM1□02-1AA14	3RM1□02-2AA14	3RM1□02-3AA14
6.1	43	7	10	1/4	1/2	1/2	1	1 1/2	3	1	1	3RM1□07-1AA14	3RM1□07-2AA14	3RM1□07-3AA14
Standard DOL Starter												0	0	0
Safety DOL Starter												1	1	1

3RM12 motor starter for reversing with electronic overload protection

with

UL ratings at 480VAC		Amp ratings		Single-phase HP ratings ①			Three-phase HP ratings ①			Signaling contacts		All Screw Terminals	All Spring Loaded Terminals	Mixed ② Spring Loaded & Screw Terminals
FLA	LRA	AC53	AC51	115V	200V	230V	200V	230V	460V	NO	NC	Order No.	Order No.	Order No.
Rated control supply voltage $U_s = 24$ VDC														
0.5	3.5	0.5	—	—	—	—	—	—	—	1	1	3RM1□01-1AA04	3RM1□01-2AA04	3RM1□01-3AA04
2	14	2	—	—	—	1/8	1/8	1/8	3/4	1	1	3RM1□02-1AA04	3RM1□02-2AA04	3RM1□02-3AA04
6.1	43	7	10	1/4	1/2	1/2	1	1 1/2	3	1	1	3RM1□07-1AA04	3RM1□07-2AA04	3RM1□07-3AA04
Rated control supply voltage $U_s = 110-230$ VAC 50/60 Hz and 110 VDC														
0.5	3.5	0.5	—	—	—	—	—	—	—	1	1	3RM1□01-1AA14	3RM1□01-2AA14	3RM1□01-3AA14
2	14	2	—	—	—	1/8	1/8	1/8	3/4	1	1	3RM1□02-1AA14	3RM1□02-2AA14	3RM1□02-3AA14
6.1	43	7	10	1/4	1/2	1/2	1	1 1/2	3	1	1	3RM1□07-1AA14	3RM1□07-2AA14	3RM1□07-3AA14
Standard Reversing Starter												2	2	2
Safety Reversing Starter												3	3	3

For detail product manuals, schematics and CAD files:
<http://www.usa.siemens.com/3RM1>

① Selection depends on motor full load amps.
Horsepower ratings are for reference only.

② Mixed terminal versions have spring loaded terminals for the control wiring and screw terminals on the mains.

This offers faster control wiring while still being able to use the 3RM19 comb busbar system on the mains.

For accessories, see page 6/6 and 6/8

For technical data, see page 6/9 and 6/10

For additional Compact Starters up to 25HP at 480V, see the 3RA6 series located in section 4



Overview

Accessories for 3RM1 motor starters

The following accessories are available for the 3RM1 motor starter:

- 3-phase infeed system for the main circuit
- Device connectors for the control circuit
- Spare terminals for main and control circuits
 - With screw terminals
 - With push-in spring-type terminals
- Push-in lugs for wall mounting the motor starters
- Sealable cover as protection against unauthorized access

Three-phase infeed system (3RM19 three-phase busbar system)

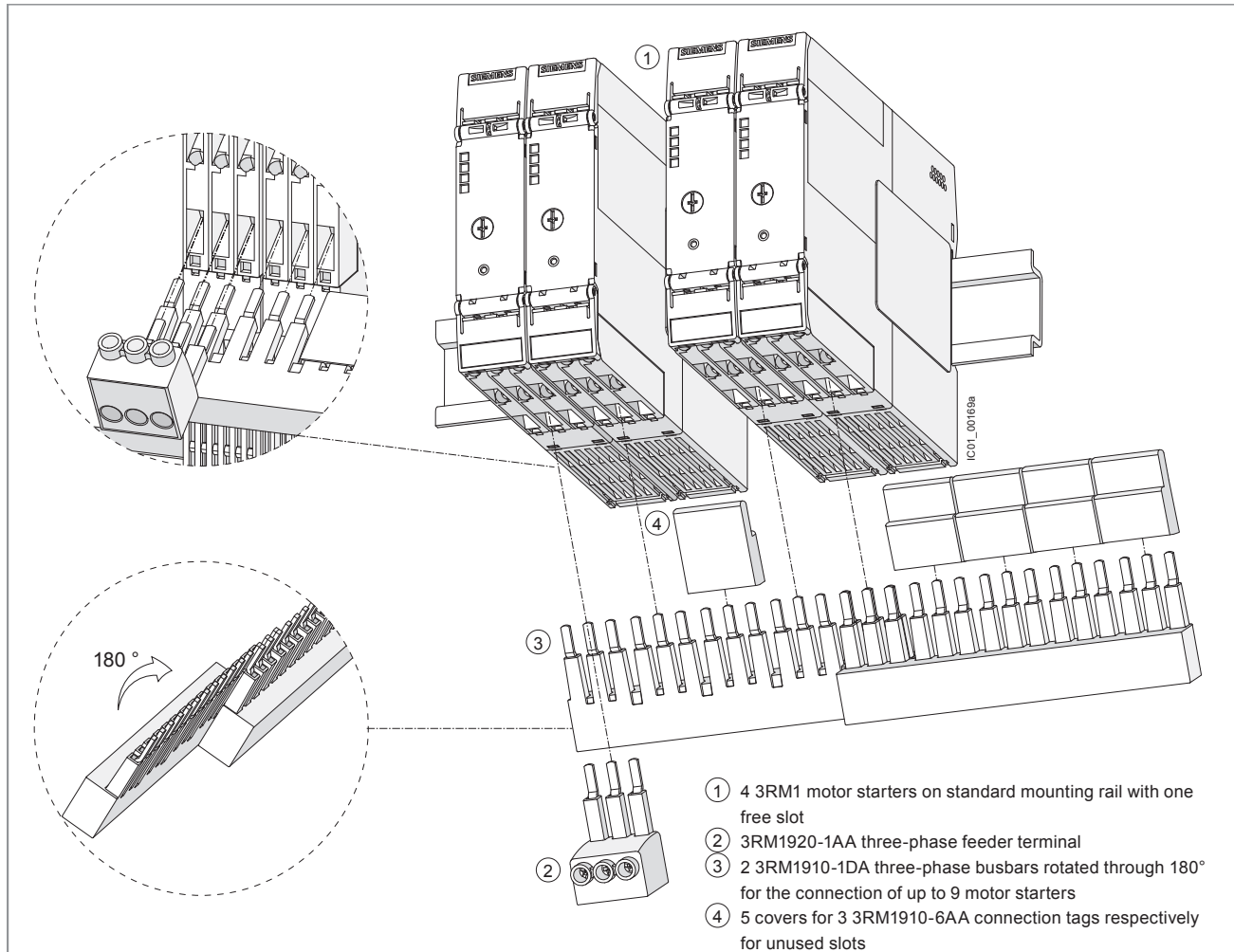
Special three-phase busbar systems can be used to provide an easy, time-saving and safe means of feeding two or more 3RM1 motor starters with screw terminals.

These busbars are available in three lengths, thus allowing 2, 3 or 5 motor starters (arranged side-by-side) to be connected at the same time. More than 5 devices can be connected by clamping the connection tags of an additional busbar rotated by 180° (e.g. 6 devices using one 5-pole busbar and one 2-pole busbar).

A single motor starter can be removed from the assembly without loosening the terminal screws of neighboring motor starters.

The maximum summation current must not exceed 25 A. Primary infeed is connected via a three-phase infeed terminal.

The three-phase busbars are finger-safe but empty connection tags must be fitted with covers.



3RM19 infeed system with three-phase infeed terminal: In the above example, two three-phase busbars (5-pole busbars) rotated through 180° allow up to 9 3RM1 motor starters to be connected. Contact with the unused connection tags in unoccupied positions is prevented safely by the covers.

Accessories

Device connectors for the control circuit

The outlay for cabling between the devices is reduced using device connectors snapped onto a mounting rail, or screwed onto a level mounting panel (one device connector per motor starter).

Using the device connectors only for feeding in the control supply voltage

By using device connectors, several motor starters can be jointly supplied with a control supply voltage of 24 V DC. This requires the control supply voltage to be applied to the A1 and A2 terminals of only one motor starter.

Up to ten motor starters can be connected with device connectors. The 24 V DC control supply voltage must be within the operating range of 0.9 to 1.1 for this purpose. If the full operating range of 0.8 to 1.25 is to be used, no more than five motor starters can be used.

If the motor starters are not to be interconnected side-by-side, device daisy chain connectors must be used for the gaps.

When removing a motor starter, the corresponding device connector must be replaced by a device daisy chain connector if the control voltage is not to be interrupted for motor starters on the right.

The last motor starter in a row can be placed on a device termination connector. Flush termination of the configuration is thus possible.

Using device connectors in conjunction with 3SK1 safety relays

Interconnection of several Standard or Failsafe version motor starters into a group can also be used for joint disconnection by a 3SK1 safety relay.

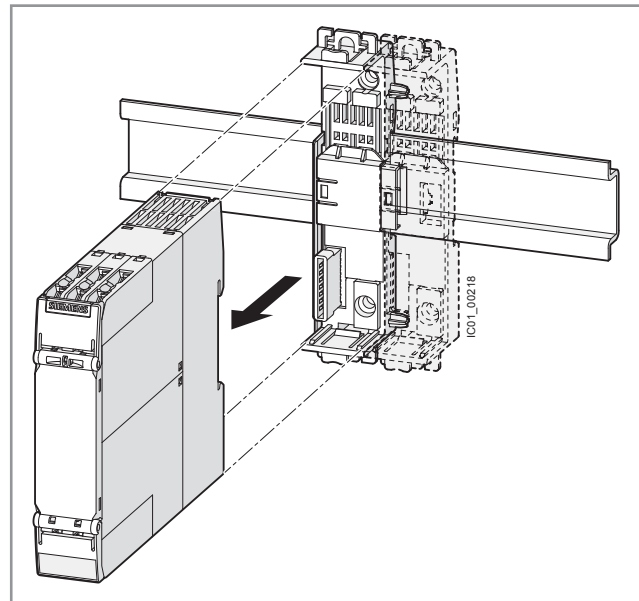
To provide for the simultaneous and safe shutdown of several motor starters via a SIRIUS 3SK1 Safety Relay, you can simply interconnect the devices without additional wiring using a device connector.

The motors can then also be shut down safely according to SIL 3 / PLe with the motor starters.

Up to five motor starters can be operated on one safety relay with device connectors. If the motor starters are not to be interconnected side-by-side, device loop through connectors must be used for the gaps.

The last motor starter in a row must be placed on a device termination connector. This closes the circuits that were built up with the connectors.

For 3SK1 safety relays and associated device connectors see Chapter 13 "Safety Technology" → "SIRIUS 3SK1 Safety Relays"



Device connectors snapped onto a standard mounting rail to allow the joint connection of the control supply voltage for 3RM1 motor starters or connection to the 3SK1 safety relays

Usage restrictions for accessories

- The 3RM19 3-phase infeed system for the main circuit can only be used with 3RM1 motor starters with screw terminals.
- The device connectors are only suitable for 3RM1 motor starters with a control supply voltage of 24 V DC.



Selection and ordering data

Device connectors for busing the control supply connection to 3RM1 Starters

**Device connector type 2, 7-pole, 22.5mm**

Use for:

- Beginning left hand connector
- Subsequent positions where a starter is present
- Maximum of five starters per system

3ZY1212-2EA00

1

Device loop through connector type 2, 7-pole, 22.5mm

Use for:

- When 22.5mm spacing is required and no starter is present

3ZY1212-2AB00

1

Device termination connector type 2, 7-pole, 22.5mm

Use for:

- Terminating connector for the right hand position
- Terminating cover is assembled to 3ZY1212-2EA00

3ZY1212-2FA00

1

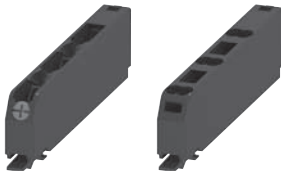
**Screw
Terminals****Spring
Terminals**

Order No.

Order No.

Pack Units

Removable terminals for 3RM1 Starters

**Power Terminals (Line and Load)**
2-pole, 12-20 AWG

3ZY1122-1BA00

3ZY1122-2BA00

6

Control Terminals3-pole, 14-20 AWG (Screw)
3-pole, 14-16 AWG (Spring)

3ZY1131-1BA00

3ZY1131-2BA00

6

Further accessories

**Push-in lugs for wall mounting**

2 lugs per starter are required. Standard pack quantity is sufficient for 5 starters

3ZY1311-0AA00

10

**Seal covers for 3RM1 starters**

Protection of current setting dial. - lockable

3ZY1321-2AA00

5

**Cooling pins for removable terminals**

For mechanical coding of removable terminals

3ZY1440-1AA00

Compact – Hybrid Starters

3RM1 Hybrid Starters



3RM1 Accessories

Selection and ordering data

	Type	Version	Order No.	Pack
3RM19 three-phase infeed system for 3RM1 starters with screw terminals on the mains				
	Three-phase feeder terminal		3RM1920-1AA	1
	Three-phase busbar system	For 2 motor starters	3RM1910-1AA	1
		For 3 motor starters	3RM1910-1BA	1
		For 5 motor starters	3RM1910-1DA	1
	Protective covers For finger safety / yellow	For unused slots	3RM1910-6AA	1



Application

3RM1 motor starters are designed for applications in which small motors have to be connected in the most confined spaces.

Main areas of use

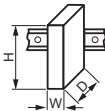
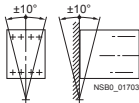
- Conveyor systems
- Logistics systems
- Production machines
- Machine tools
- Small elevators

Standards and approvals

The motor starter complies with the following standards:

- IEC/EN 60947-4-2
- UL 508
- ATEX (available soon)
- IEC 61508-1: SIL 3 (available soon)
- ISO 13849: PLe (available soon)

Technical specifications

Type	3RM1	
Mechanical components and environment		
Dimensions (W x H x D) <ul style="list-style-type: none">• Width• Height• Depth		mm mm mm 22.5 100 136.5 (from the standard mounting rail) 141.6 (entire enclosure depth)
Ambient temperature <ul style="list-style-type: none">• During operation• During storage• During transport	°C °C °C	-25 ... +60 -40 ... +70 -40 ... +70
Installation altitude at height above sea level maximum	m	4 000
Shock resistance		6g/11 ms
Vibration resistance		1 ... 6 Hz, 15 mm; 20 m/s², 500 Hz
IP degree of protection		IP20
Mounting position		
Electromagnetic compatibility (EMC)		
Emitted interference <ul style="list-style-type: none">• Conducted RF interference emission according to CISPR11• Non-conducted RF interference emission according to CISPR11		Class A for Industrial applications. Class B for residential, business and commercial applications. Class A for industrial applications. Class B for residential, business and commercial applications.
Interference immunity <ul style="list-style-type: none">• Electrostatic discharge according to IEC 61000-4-2• Conducted interference injection as high frequency interference according to IEC 61000-4-6• Conducted interference BURST according to IEC 61000-4-4• Conducted interference - phase-to-ground SURGE according to IEC 61000-4-5• Conducted interference - phase-to-phase SURGE according to IEC 61000-4-5		4 kV contact discharge / 8 kV air discharge 10 V 2 kV / 5 kHz 2 kV 1 kV

Type	3RM1 .01	3RM1 .02	3RM1 .07
Main circuit			
Rated operational voltage maximum	V	500	
Operating frequency			
• 1 rated value	Hz	50	
• 2 rated value	Hz	60	
Rated insulation voltage	V	600	
Rated impulse withstand voltage	kV	6	
Rated operational current at 400 V at AC	A	0.5	2
Active power loss, typical	W	0.02	0.3
Minimum load in % of I_M	%	20	7 ¹⁾
Adjustable current response value			
• of the inverse-time delayed overload release	A	0.1 ... 0.5	0.4 ... 2
			1.6 ... 7 ¹⁾

¹⁾ UL rating is 6.1A at 480V

Compact – Hybrid Starters

SIRIUS 3RM1 Motor Starters



Technical data

Type		3RM1 ...-AA04	3RM1 ...-AA14
Control circuits			
Type of voltage of the control supply voltage		DC	AC/DC
Control supply voltage 1			
• At DC	V	24	110
• At 50 Hz			
- At AC	V	—	110 ... 230
Frequency of the control supply voltage			
• 1 rated value	Hz	—	50
• 2 rated value	Hz	—	60
Operating range factor of the control supply voltage rated value			
• At DC		0.8 ... 1.25	0.85 ... 1.1
• At 50 Hz			
- At AC		—	0.85 ... 1.1
Control current		A	0.08
Input voltage at the digital input			
• At DC	V	24	110
• At AC	V	—	110 ... 230
- Rated value			
Input voltage at the digital input with signal <1>			
• At DC	V	19.2 ... 30	93 ... 121
• At AC	V	—	93 ... 253
Input current at the digital input with signal <1> typical		A	0.01
			0.002

Type		3RM1...-14	3RM1...-24
Connection methods			
Connectable conductor cross-section for main contacts			
• Solid	mm ²	0.5 ... 4	
• Finely stranded			
- With end sleeves	mm ²	0.5 ... 2.5	
- Without end sleeves	mm ²	—	0.5 ... 4
Connectable conductor cross-section for auxiliary contacts			
• Solid	mm ²	0.5 ... 2.5	0.5 ... 1.5
• Finely stranded			
- With end sleeves	mm ²	0.5 ... 2.5	0.5 ... 1
- Without end sleeves	mm ²	—	0.5 ... 1.5
AWG number as coded connectable conductor cross-section			
• For main contacts		20 ... 12	
• For auxiliary contacts		20 ... 14	20 ... 16

Note:

All the above technical specifications are relevant for selecting the motor starters. Details about installation conditions and the use of the motor starters, and particularly about the derating of the rated current, can be found in the manual and the data sheets located at www.usa.siemens.com/3RM1.

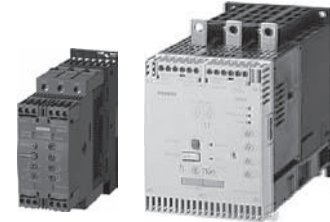
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3RW30



3RW40



3RW44



Class 73/74

Motor Starters, Soft Starters and Load Feeders

Introduction

Overview



For operation in the control cabinet

3RW soft starters for standard applications

	<ul style="list-style-type: none"> Application areas <ul style="list-style-type: none"> - Fans - Building/construction machines - Escalators - Air conditioning systems - Assembly lines - Operating mechanisms - Pumps - Presses - Transport systems - Fans - Compressors and coolers 		
3RW30 soft starters	<ul style="list-style-type: none"> SIRIUS 3RW30 soft starters for soft starting and smooth ramp-down of three-phase asynchronous motors Performance range of up to 75 Hp (at 460 V) 	3RW30	7/4
3RW40 soft starters	<ul style="list-style-type: none"> SIRIUS 3RW40 soft starters with the integral functions <ul style="list-style-type: none"> - Solid-state motor overload and intrinsic device protection and - Adjustable current limiting for the soft starting and stopping of three-phase asynchronous motors Performance range of up to 300 Hp (at 460 V) 	3RW40	7/8

3RW soft starters for high-feature applications

	<ul style="list-style-type: none"> Application areas <ul style="list-style-type: none"> - Pumps - Compressors - Industrial refrigerating systems - Conveying systems - Machine tools - Fans - Cooling systems - Water transport - Hydraulics - Mills 		
3RW44 soft starters	<ul style="list-style-type: none"> In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements Performance range <ul style="list-style-type: none"> - Up to 900 Hp (at 460 V) in inline circuit and - Up to 1600 Hp (at 460 V) in inside-delta circuit 	3RW44	7/16

For enclosed applications

Enclosures in NEMA 1, 3, 4, & 12 types UL/CSA listed	<ul style="list-style-type: none"> Complete starter includes 3RW40 or 3RW44 and CPT Performance Range of up to 600 Hp (at 460 V) Combination options include circuit breaker or fusible disconnect 	Class 73/74	7/83
	<ul style="list-style-type: none"> Application areas: <ul style="list-style-type: none"> - Compressors - Pumps - Stamping presses - Cooling towers - Molding and extruding - Chippers and debarkers - Lumber processing - Pulp & paper processing - Conveyors - Textiles - HVAC 		

For Operation in the Control Cabinet

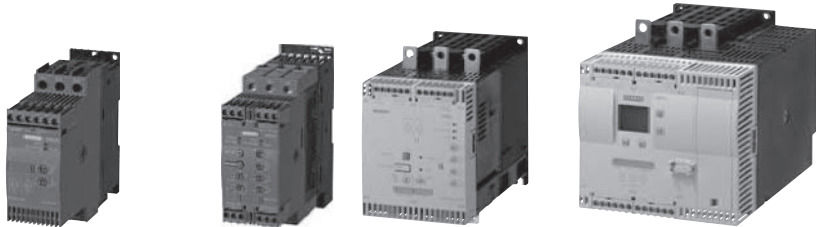
3RW Soft Starters

General Data

Overview

The advantages of the SIRIUS soft starters at a glance:

- Soft starting and smooth ramp-down¹⁾
- Stepless starting
- Reduction of current peaks
- Avoidance of mains voltage fluctuations during starting
- Reduced load on the power supply network
- Reduction of the mechanical load in the operating mechanism
- Considerable space savings and reduced wiring compared with conventional starters
- Maintenance-free switching
- Very easy handling
- Fits perfectly in the SIRIUS modular system



		SIRIUS 3RW30 Standard applications	SIRIUS 3RW40 Standard applications	SIRIUS 3RW44 High-Feature applications
Rated current up to 50 °C	A	3 ... 98	11 ... 385	26 ... 1076
Rated operational voltage	V	200 ... 480	200 ... 600	200 ... 690
Motor rating at 460 V				
• Inline circuit	Hp	1.5 ... 75	7.5 ... 300	15 ... 900
• Inside-delta circuit	Hp	--	--	22 ... 1600
Ambient temperature	°C	-25 ... +60	-25 ... +60	0 ... +60
Soft starting/ramp-down		✓ ¹⁾	✓	✓
Voltage ramp		✓	✓	✓
Starting/stopping voltage	%	40 ... 100	40 ... 100	20 ... 100
Starting and ramp-down time ⁷⁾	s	0 ... 20	0 ... 20	1 ... 360
Torque control		--	--	✓
Starting/stopping torque	%	--	--	20 ... 100
Torque limit	%	--	--	20 ... 200
Ramp time	s	--	--	1 ... 360
Integral bypass contact system		✓	✓	✓
Intrinsic device protection		--	✓	✓
Motor overload protection		--	✓	✓
Thermistor motor protection		--	✓ ²⁾	✓
Integrated remote RESET		--	✓ ³⁾	✓
Adjustable current limiting		--	✓	✓
Inside-delta circuit		--	--	✓
Breakaway pulse		--	--	✓
Creep speed in both directions of rotation		--	--	✓
Pump ramp-down		--	--	✓ ⁴⁾
DC braking		--	--	✓ ⁴⁾ 5)
Combined braking		--	--	✓ ⁴⁾ 5)
Motor heating		--	--	✓
Communication		--	--	With PROFIBUS DP (optional)
External display and operator module		--	--	(optional)
Operating measured value display		--	--	✓
Error logbook		--	--	✓
Event list		--	--	✓
Slave pointer function		--	--	✓
Trace function		--	--	✓ ⁶⁾
Programmable control inputs and outputs		--	--	✓
Number of parameter sets		1	1	3
Parameterization software (Soft Starter ES)		--	--	✓
Power semiconductors (thyristors)		2 controlled phases	2 controlled phases	3 controlled phases
Screw terminals		✓	✓	✓
Spring-type terminals		✓	✓	✓
UL/CSA		✓	✓	✓
CE marking		✓	✓	✓
Soft starting under heavy starting conditions		--	--	✓ ⁴⁾

Configuring support

Win-Soft Starter, Electronic Application Selector, Technical Assistance Tel.: 1-800-333-7421

✓ Function is available; -- Function is not available.

¹⁾ Only soft starting available for 3RW30.

²⁾ Optional up to size S3 (device variant).

³⁾ Available for 3RW40 2. to 3RW40 4.; optional for 3RW40 5. and 3RW40 7..

⁴⁾ Calculate soft starter and motor with size allowance where required.

⁵⁾ Not possible in inside-delta circuit.

⁶⁾ Trace function with Soft Starter ES software.

⁷⁾ Actual motor start times are load dependent.

You can find further information on the Internet at:

www.usa.siemens.com/softstarters

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Overview

The SIRIUS 3RW30 soft starters reduce the motor voltage through variable phase control and increase it in ramp-like mode from a selectable starting voltage up to mains voltage. During starting, these devices limit the torque as well as the current and prevent the shocks which arise during direct starts or wye-delta starts. In this way, mechanical loads and mains voltage dips can be reliably reduced.

Soft starting reduces the stress on the connected equipment and results in lower wear and therefore longer periods of trouble-free production. The selectable start value means that the soft starters can be adjusted individually to the requirements of the application in question and unlike wye-delta starters are not restricted to two-stage starting with fixed voltage ratios.¹⁾

The SIRIUS 3RW30 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that minimal power loss is used at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

Various versions of the SIRIUS 3RW30 soft starters are available:

- Standard version for fixed-speed three-phase motors, sizes S00, S0, S2 and S3, with integrated bypass contact system
- Version for fixed-speed three-phase motors in a 22.5 mm enclosure without bypass

Soft starters rated up to 75 Hp (at 460 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple start-up are just three of the many advantages of this soft starter.

Application

The 3RW30 soft starters are suitable for soft starting of three-phase asynchronous motors.

Due to two-phase control, the current is kept at minimum values in all three phases throughout the entire starting time. Due to continuous voltage influencing, current and torque peaks, which are unavoidable in the case of wye-delta starters, for instance, do not occur.

Application areas

- Pumps
- Heat pumps
- Hydraulic pumps
- Presses
- Conveyors
- Roller conveyor
- Screw conveyors

¹⁾ Actual motor start times are load dependent.

Selection and ordering data



3RW30 18-1BB14



3RW30 28-1BB14



3RW30 38-1BB14



3RW30 47-1BB14



3RW30 03-2CB54

Ambient temperature 40 °C				Ambient temperature 50 °C				Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage U_e			Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage U_e							
	230 V	400 V	500 V		200 V	230 V	460 V	575 V				
A	kW	kW	kW	A	hp	hp	hp	hp				

Rated operational voltage U_e 200 ... 480 V

• With screw terminals

3.6	0.75	1.5	--	3	0.5	0.5	1.5	--	S00	3RW30 13-1BB□4	1 unit	0.580
6.5	1.5	3	--	4.8	1	1	3	--	S00	3RW30 14-1BB□4	1 unit	0.580
9	2.2	4	--	7.8	2	2	5	--	S00	3RW30 16-1BB□4	1 unit	0.580
12.5	3	5.5	--	11	3	3	7.5	--	S00	3RW30 17-1BB□4	1 unit	0.580
17.6	4	7.5	--	17	3	3	10	--	S00	3RW30 18-1BB□4	1 unit	0.580

• With spring-type terminals

3.6	0.75	1.5	--	3	0.5	0.5	1.5	--	S00	3RW30 13-2BB□4	1 unit	0.580
6.5	1.5	3	--	4.8	1	1	3	--	S00	3RW30 14-2BB□4	1 unit	0.580
9	2.2	4	--	7.8	2	2	5	--	S00	3RW30 16-2BB□4	1 unit	0.580
12.5	3	5.5	--	11	3	3	7.5	--	S00	3RW30 17-2BB□4	1 unit	0.580
17.6	4	7.5	--	17	3	3	10	--	S00	3RW30 18-2BB□4	1 unit	0.580

• With screw terminals

25	5.5	11	--	23	5	5	15	--	S0	3RW30 26-1BB□4	1 unit	0.690
32	7.5	15	--	29	7.5	7.5	20	--	S0	3RW30 27-1BB□4	1 unit	0.690
38	11	18.5	--	34	10	10	25	--	S0	3RW30 28-1BB□4	1 unit	0.690

• With spring-type terminals

25	5.5	11	--	23	5	5	15	--	S0	3RW30 26-2BB□4	1 unit	0.690
32	7.5	15	--	29	7.5	7.5	20	--	S0	3RW30 27-2BB□4	1 unit	0.690
38	11	18.5	--	34	10	10	25	--	S0	3RW30 28-2BB□4	1 unit	0.690

• With screw-type or spring-type terminals

45	11	22	--	42	10	15	30	--	S2	3RW30 36-□BB□4	1 unit	1.200
63	18.5	30	--	58	15	20	40	--	S2	3RW30 37-□BB□4	1 unit	1.200
72	22	37	--	62	20	20	40	--	S2	3RW30 38-□BB□4	1 unit	1.200

• With screw-type or spring-type terminals

80	22	45	--	73	20	25	50	--	S3	3RW30 46-□BB□4	1 unit	1.710
106	30	55	--	98	30	30	75	--	S3	3RW30 47-□BB□4	1 unit	1.710

Order No. supplement for connection types

- With screw terminals
- With spring-type terminals²⁾

Order No. supplement for rated control supply voltage U_s

- 24 V AC/DC
- 110 ... 230 V

Soft starters for easy starting conditions and high switching frequency,
rated operational voltage U_e 200 ... 400 V,
rated control supply voltage U_s 24 ... 230 V AC/DC

3	0.55	1.1	--	2.6	0.5	0.5	--	--	22.5 mm	3RW30 03-1CB54	1 unit	0.207
										3RW30 03-2CB54	1 unit	0.188

- With screw terminals
 - With spring-type terminals
- ¹⁾ Stand-alone installation.
²⁾ Power connection: screw terminals.

Note:

Selection of the soft starter depends on the rated motor current.

The SIRIUS 3RW30 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40 °C, see technical specifications (see technical information on page 7/44).

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Accessories

For soft starters		Motor starter protectors	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Type	Size	Size				kg
Auxiliary terminals						
Auxiliary terminals, 3-pole						
3RW30 4.	S3		3RT19 46-4F		1 unit	0.035
Covers for soft starters						
Terminal covers for box terminals						
Additional touch protection to be fitted at the box terminals (2 units required per device)						
3RW30 3.	S2		3RT19 36-4EA2		1 unit	0.020
3RW30 4.	S3		3RT19 46-4EA2		1 unit	0.025
Terminal covers for cable lugs and busbar connections						
For complying with the phase clearances and as touch protection if box terminal is removed (2 units required per contactor)						
3RW30 4.	S3		3RT19 46-4EA1		1 unit	0.040
Link modules to motor starter protectors						
3RW30 13, 3RW30 14, 3RW30 16, 3RW30 17, 3RW30 18			3RA19 21-1A		10 units	0.028
3RW30 26	S0	S0	3RA19 21-1A		10 units	0.028
3RW30 36	S2	S2	3RA19 31-1A		5 units	0.033
3RW30 46, 3RW30 47	S3	S3	3RA19 41-1A		5 units	0.072
Operating instructions¹⁾						
For soft starters						
3RW30 1.	S00		3ZX10 12-0RW30-2DA1			
3RW30 2.	S0					
3RW30 3.	S2					
3RW30 4.	S3					

¹⁾ The operating instructions are included in the scope of supply.

Version	Functionality Functions	Order No.	List Price \$ per PU	Weight per PU approx.
				kg
Covers and push-in lugs (only for 3RW30 03)				
Sealable covers		3RP1 902		5 units 0.004
For securing against unauthorized adjustment of setting knobs				
Push-in lugs		3RP1 903		10 units 0.002
For screw fixing				

3RP1 902

3RP1 903

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 300 % $I_{n \text{ motor}}$).
The soft starter rating can be selected to be as high as the rating of the motor used.

Application		Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
Starting parameters							
• Voltage ramp and current limiting							
- Starting voltage	%	70	60	50	40	40	40
- Starting time	s	10	10	20	20	10	10

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during start-up. Actual start times are load dependent.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

Configuration

The 3RW solid-state motor controllers are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

If necessary, an overload relay for heavy starting must be selected where long starting times are involved. PTC sensors are recommended.

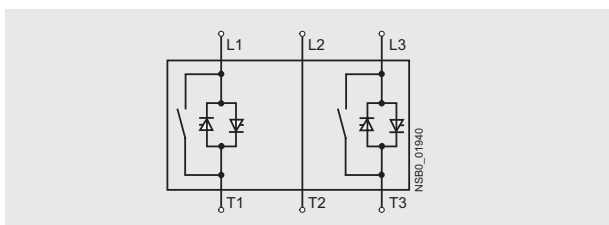
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses, controls and overload relays) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

Note:

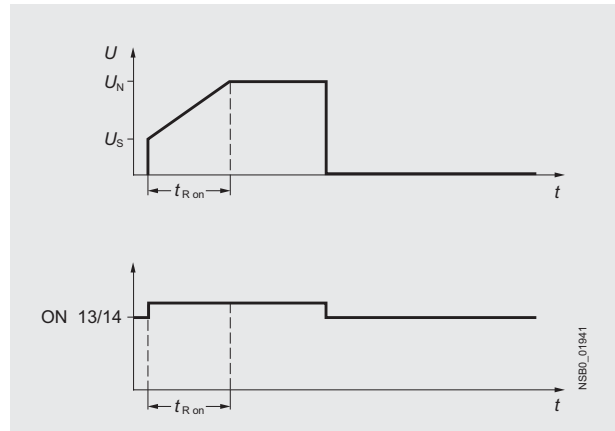
When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Power electronics schematic circuit diagram



A bypass contact system is already integrated in the 3RW30 soft starter and therefore does not have to be ordered separately.

Status graphs



Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

<http://www.siemens.de/sanftstarter> > Software

More information can be found on the Internet at:

<http://www.sea.siemens.com/softstarters>

For Operation in the Control Cabinet

3RW Soft Starters

3RW40

for standard applications

Overview

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30 soft starters.

The SIRIUS 3RW40 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that minimal power is used at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

At the same time this soft starter comes with additional integrated functions such as adjustable current limiting, motor overload and intrinsic device protection, and optional thermistor motor protection on some models.

Internal intrinsic device protection prevents the thermal overloading of the thyristors and the power section defects this can cause. As an option the thyristors can also be protected by semiconductor fuses from short-circuiting.

Thanks to integrated status monitoring and fault monitoring, this compact soft starter offers many different diagnostics options. Up to four LEDs and relay outputs permit differentiated monitoring and diagnostics of the operating mechanism by indicating the operating state as well as for example mains or phase failure, missing load, non-permissible tripping time/class setting, thermal overloading or device faults.

Soft starters rated up to 300 Hp (at 460 V) for standard applications in three-phase systems are available. Extremely small sizes, low power losses and simple start-up are just three of the many advantages of the SIRIUS 3RW40 soft starters.

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RW40 soft starter sizes S0 to S12 are suitable for the starting of explosion-proof motors with "increased safety" type of protection EEx e.

See "Appendix" → "Standards and approvals" → "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)".

Application

The SIRIUS 3RW40 solid-state soft starters are suitable for soft starting and stopping of three-phase asynchronous motors.

Due to two-phase control, the current is kept at minimum values in all three phases throughout the entire starting time and disturbing direct current components are eliminated in addition. This not only enables the two-phase starting of motors up to 300 Hp (at 460 V) but also avoids the current and torque peaks which occur e. g. with wye-delta starters.

Application areas

- Pumps
- Heat pumps
- Hydraulic pumps
- Presses
- Conveyors
- Roller conveyor
- Screw conveyors
- Escalators
- Small fans
- Centrifugal blowers
- Bow thrusters
- Stirrers
- Extruders
- Lathes
- Milling machines

Selection and ordering data



3RW40 28-1BB14



3RW40 38-1BB14



3RW40 47-1BB14

Ambient temperature 50 °C					Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated power of induction motors for rated operational voltage U_e									
Rated operational current $I_e^{1)}$									
200 V									
230 V									
460 V									
575 V									
A	hp	hp	hp	hp					kg
Rated operational voltage U_e 200 ... 480 V									
• With screw terminals									
11	3	3	7.5	--	S0	3RW40 24-1BB□4		1 unit	0.770
23	5	5	15	--	S0	3RW40 26-1BB□4		1 unit	0.770
29	7.5	7.5	20	--	S0	3RW40 27-1BB□4		1 unit	0.770
34	10	10	25	--	S0	3RW40 28-1BB□4		1 unit	0.770
• With spring-type terminals									
11	3	3	7.5	--	S0	3RW40 24-2BB□4		1 unit	0.770
23	5	5	15	--	S0	3RW40 26-2BB□4		1 unit	0.770
29	7.5	7.5	20	--	S0	3RW40 27-2BB□4		1 unit	0.770
34	10	10	25	--	S0	3RW40 28-2BB□4		1 unit	0.770
• With screw or spring-type terminals									
42	10	15	30	--	S2	3RW40 36-□BB□4		1 unit	1.350
58	15	20	40	--	S2	3RW40 37-□BB□4		1 unit	1.350
62	20	20	40	--	S2	3RW40 38-□BB□4		1 unit	1.350
• With screw or spring-type terminals									
73	20	25	50	--	S3	3RW40 46-□BB□4		1 unit	1.900
98	30	30	75	--	S3	3RW40 47-□BB□4		1 unit	1.900
Rated operational voltage U_e 400 ... 600 V									
• With screw terminals									
11	--	--	7.5	10	S0	3RW40 24-1BB□5		1 unit	0.770
23	--	--	15	20	S0	3RW40 26-1BB□5		1 unit	0.770
29	--	--	20	25	S0	3RW40 27-1BB□5		1 unit	0.770
34	--	--	25	30	S0	3RW40 28-1BB□5		1 unit	0.770
• With spring-type terminals									
11	--	--	7.5	10	S0	3RW40 24-2BB□5		1 unit	0.770
23	--	--	15	20	S0	3RW40 26-2BB□5		1 unit	0.770
29	--	--	20	25	S0	3RW40 27-2BB□5		1 unit	0.770
34	--	--	25	30	S0	3RW40 28-2BB□5		1 unit	0.770
• With screw or spring-type terminals									
42	--	--	30	40	S2	3RW40 36-□BB□5		1 unit	1.350
58	--	--	40	50	S2	3RW40 37-□BB□5		1 unit	1.350
62	--	--	40	60	S2	3RW40 38-□BB□5		1 unit	1.350
• With screw or spring-type terminals									
73	--	--	50	60	S3	3RW40 46-□BB□5		1 unit	1.900
98	--	--	75	75	S3	3RW40 47-□BB□5		1 unit	1.900

Order No. supplement for connection types

- With screw terminals
- With spring-type terminals²⁾

Order No. supplement for rated control supply voltage U_s

- 24 V AC/DC
- 110 ... 230 V AC/DC

1) Stand-alone installation without auxiliary fan.

2) Power connection: screw terminals.

1
20
1

Note:

Selection of the soft starter depends on the rated motor current.

The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures other than 50°C, see technical information on page 7/56

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications



3RW40 28-1TB04



3RW40 38-1TB04



3RW40 47-1TB04

Ambient temperature 50 °C					Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current I_e ¹⁾	Rated power of induction motors for rated operational voltage U_e								
	200 V	230 V	460 V	575 V					
A	hp	hp	hp	hp					kg
Rated operational voltage U_e 200 ... 480 V, with thermistor motor protection, rated control supply voltage U_s 24 V AC/DC									
• With screw terminals									
11	3	3	7.5	--	S0	3RW40 24-1TB04		1 unit	0.770
23	5	5	15	--	S0	3RW40 26-1TB04		1 unit	0.770
29	7.5	7.5	20	--	S0	3RW40 27-1TB04		1 unit	0.770
34	10	10	25	--	S0	3RW40 28-1TB04		1 unit	0.770
• With spring-type terminals									
11	3	3	7.5	--	S0	3RW40 24-2TB04		1 unit	0.770
23	5	5	15	--	S0	3RW40 26-2TB04		1 unit	0.770
29	7.5	7.5	20	--	S0	3RW40 27-2TB04		1 unit	0.770
34	10	10	25	--	S0	3RW40 28-2TB04		1 unit	0.770
• With screw or spring-type terminals									
42	10	15	30	--	S2	3RW40 36-□TB04		1 unit	1.350
58	15	20	40	--	S2	3RW40 37-□TB04		1 unit	1.350
62	20	20	40	--	S2	3RW40 38-□TB04		1 unit	1.350
• With screw or spring-type terminals									
73	20	25	50	--	S3	3RW40 46-□TB04		1 unit	1.900
98	30	30	75	--	S3	3RW40 47-□TB04		1 unit	1.900
Rated operational voltage U_e 400 ... 600 V, with thermistor motor protection, rated control supply voltage U_s 24 V AC/DC									
• With screw terminals									
11	--	--	7.5	10	S0	3RW40 24-1TB05		1 unit	0.770
23	--	--	15	20	S0	3RW40 26-1TB05		1 unit	0.770
29	--	--	20	25	S0	3RW40 27-1TB05		1 unit	0.770
34	--	--	25	30	S0	3RW40 28-1TB05		1 unit	0.770
• With spring-type terminals									
11	--	--	7.5	10	S0	3RW40 24-2TB05		1 unit	0.770
23	--	--	15	20	S0	3RW40 26-2TB05		1 unit	0.770
29	--	--	20	25	S0	3RW40 27-2TB05		1 unit	0.770
34	--	--	25	30	S0	3RW40 28-2TB05		1 unit	0.770
• With screw or spring-type terminals									
42	--	--	30	40	S2	3RW40 36-□TB05		1 unit	1.350
58	--	--	40	50	S2	3RW40 37-□TB05		1 unit	1.350
62	--	--	40	60	S2	3RW40 38-□TB05		1 unit	1.350
• With screw or spring-type terminals									
73	--	--	50	60	S3	3RW40 46-□TB05		1 unit	1.900
98	--	--	75	75	S3	3RW40 47-□TB05		1 unit	1.900

Order No. supplement for connection types

- With screw terminals
- With spring-type terminals²⁾

¹⁾ Stand-alone installation without auxiliary fan.

²⁾ Power connection: screw terminals.

1
2

Note:

Selection of the soft starter depends on the rated motor current.

The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40° C, see technical information on page 7/56

For Operation in the Control Cabinet

3RW Soft Starters

3RW40
for standard applications



3RW40 56-6BB44



3RW40 76-6BB44

Ambient temperature 50 °C					Size	Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current I_e ¹⁾	Rated power of induction motors for rated operational voltage U_e								
	200 V	230 V	460 V	575 V					
A	hp	hp	hp	hp					kg
Rated operational voltage U_e 200 ... 460 V									
• With screw or spring-type terminals									
117	30	40	75	--	S6	3RW40 55-□BB□4		1 unit	4.900
145	40	50	100	--		3RW40 56-□BB□4		1 unit	6.900
• With screw or spring-type terminals									
205	60	75	150	--	S12	3RW40 73-□BB□4		1 unit	8.900
248	75	100	200	--		3RW40 74-□BB□4		1 unit	8.900
315	100	125	250	--		3RW40 75-□BB□4		1 unit	8.900
385	125	150	300	--		3RW40 76-□BB□4		1 unit	8.900
Rated operational voltage U_e 400 ... 600 V									
• With screw or spring-type terminals									
117	--	--	75	100	S6	3RW40 55-□BB□5		1 unit	4.900
145	--	--	100	150		3RW40 56-□BB□5		1 unit	6.900
• With screw or spring-type terminals									
205	--	--	150	200	S12	3RW40 73-□BB□5		1 unit	8.900
248	--	--	200	250		3RW40 74-□BB□5		1 unit	8.900
315	--	--	250	300		3RW40 75-□BB□5		1 unit	8.900
385	--	--	300	400		3RW40 76-□BB□5		1 unit	8.900

Order No. supplement for connection types²⁾

- With screw terminals
- With spring-type terminals

Order No. supplement for the rated control supply voltage U_s ³⁾

- 115 V AC
- 230 V AC

1) Stand-alone installation.

2) Power connection: busbar connection.

3) Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

Note:

Selection of the soft starter depends on the rated motor current.

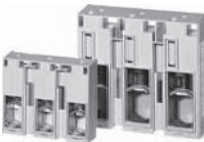
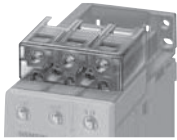




The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures $> 40^\circ\text{C}$, see technical information on page 7/56

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

Accessories

For soft starters		Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type	Size					
Box terminal blocks for soft starters						
For round and flat wires						
	3RW40 5.	S6	• Up to 70 mm ² • Up to 120 mm ²	3RT19 55-4G	1 unit	0.230
	3RW40 7.	S12	• Up to 240 mm ²	3RT19 56-4G	1 unit	0.260
				3RT19 66-4G	1 unit	0.676
Auxiliary terminals						
Auxiliary terminals, 3-pole						
3RW40 4.	S3		3RT19 46-4F		1 unit	0.035
Covers for soft starters						
Terminal covers for box terminals						
Additional touch protection to be fitted at the box terminals (2 units required per device)						
	3RW40 3.	S2		3RT19 36-4EA2	1 unit	0.020
	3RW40 4.	S3		3RT19 46-4EA2	1 unit	0.025
	3RW40 5.	S6		3RT19 56-4EA2	1 unit	0.030
	3RW40 7.	S12		3RT19 66-4EA2	1 unit	0.040
Terminal covers for cable lugs and busbar connections						
For complying with the phase clearances and as touch protection if box terminal is removed (2 units required per contactor)						
	3RW40 4.	S3		3RT19 46-4EA1	1 unit	0.040
	3RW40 5.	S6		3RT19 56-4EA1	1 unit	0.070
	3RW40 7.	S12		3RT19 66-4EA1	1 unit	0.130
Sealing covers						
	3RW40 2. to 3RW40 4.	S0, S2, S3		3RW49 00-0PB10	1 unit	0.005
	3RW40 5. and 3RW40 7.	S6, S12		3RW49 00-0PB00	1 unit	0.010
Modules for RESET¹⁾						
Modules for remote RESET, electrical						
Operating range 0.85 ... 1.1 x U _N , power consumption 80 VA AC, 70 W DC, ON period 0.2 s ... 4 s, switching frequency 60/h						
	3RW40 5. and 3RW40 7.	S6, S12	• 24 ... 30 V AC/DC • 110 ... 127 V AC/DC • 220 ... 250 V AC/DC	3RU19 00-2AB71 3RU19 00-2AF71 3RU19 00-2AM71	1 unit 1 unit 1 unit	0.066 0.067 0.066
	Mechanical RESET comprising					
	3RW40 5. and 3RW40 7.	S6, S12	• Resetting plungers, holders and formers • Suitable pushbutton IP65, Ø 22 mm, 12 mm stroke • Extension plunger	3RU19 00-1A 3SB30 00-0EA11 3SX13 35	1 unit 1 unit 1 unit	0.038 0.020 0.004
Cable releases with holder for RESET						
For Ø 6.5 mm holes in the control panel; max. control panel thickness 8 mm						
	3RW40 5. and 3RW40 7.	S6, S12	• Length 400 mm • Length 600 mm	3RU19 00-1B 3RU19 00-1C	1 unit 1 unit	0.063 0.073

¹⁾ Remote RESET already integrated in the 3RW40 2. to 3RW40 4. soft starters.

For Operation in the Control Cabinet

3RW Soft Starters

3RW40
for standard applications

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7


For soft starters		Motor starter protectors		Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type	Size	Size					
Link modules to motor starter protectors							
	3RW40 24, 3RW40 26	S0	S0	3RA19 21-1A		10 units	0.028
	3RW40 36	S2	S2	3RA19 31-1A		5 units	0.033
	3RW40 46, 3RW40 47	S3	S3	3RA19 41-1A		5 units	0.072
Fans (to increase switching frequency and for device mounting in positions different from the normal position)							
	3RW40 2.	S0		3RW49 28-8VB00		1 unit	0.010
	3RW40 3., 3RW40 4.	S2, S3		3RW49 47-8VB00		1 unit	0.020
Operating instructions ¹⁾							
For soft starters							
3RW40 2.	S0			3ZX10 12-0RW40-1AA1			
3RW40 3.	S2						
3RW40 4.	S3						
3RW40 5.	S6			3ZX10 12-0RW40-2DA1			
3RW40 7.	S12						

¹⁾ The operating instructions are included in the scope of supply.

They are also available on the Internet at:

www.usa.siemens.com/softstarters

Spare parts

For soft starters		Version		Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type	Size	Rated control supply voltage U_s					
Fans							
	Fans						
	3RW40 5.-.BB3.	S6	115 V AC	3RW49 36-8VX30		1 unit	0.300
	3RW40 5.-.BB4.	S6	230 V AC	3RW49 36-8VX40		1 unit	0.300
	3RW40 7.-.BB3.	S12	115 V AC	3RW49 47-8VX30		1 unit	0.500
	3RW40 7.-.BB4.	S12	230 V AC	3RW49 47-8VX40		1 unit	0.500

For Operation in the Control Cabinet

3RW Soft Starters

3RW40

for standard applications

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n \text{ motor}}$).

The soft starter rating can be selected to be as high as the rating of the motor used.

Application	Conveyor belt	Roller conveyor	Small fan	Pump	Hydraulic pump
Starting parameters					
• Voltage ramp and current limiting					
- Starting voltage	%	70	60	40	40
- Starting time	s	10	10	10	10
- Current limit value		$5 \times I_M$	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
Ramp-down time	s	5	5	0	0

Application examples for heavy starting (Class 20)

Heavy starting Class 20 (up to 40 s with 350 % $I_{n \text{ motor}}$).

The soft starter has to be selected at least one rating class higher than the motor used.

Application	Stirrer	Centrifuge
Starting parameters		
• Voltage ramp and current limiting		
- Starting voltage	%	40
- Starting time	s	20
- Current limit value		$4 \times I_M$
Ramp-down time	0	0

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during start-up. Actual start times are load dependent.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

Configuration

The 3RW solid-state soft starters are designed for easy starting conditions. In the event of severe conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

Where long starting times are involved, the integrated solid-state overload relay for heavy starting should not be disconnected. PTC sensors are recommended. This also applies for the smooth ramp-down because during the ramp-down time an additional current loading applies in contrast to free ramp-down.

In the case of high switching frequencies in S4 mode, Siemens recommends the use of PTC sensors. For corresponding device versions with integrated thermistor motor protection or separate thermistor evaluation devices see Industrial Controls catalog Chapter 11 "Function Relays, Interfaces and Converters".

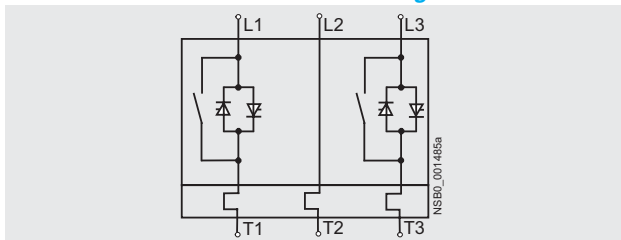
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment, PFC capacitors). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

Note:

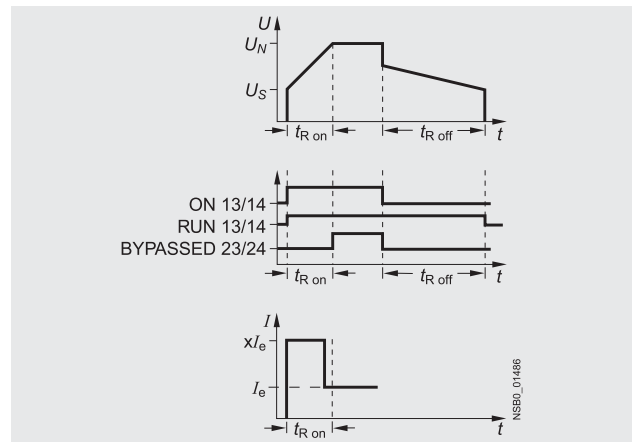
When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Power electronics schematic circuit diagram



A bypass contact system and solid-state overload relay are already integrated in the 3RW40 soft starter and therefore do not have to be ordered separately.

Status graphs¹⁾



Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

www.usa.siemens.com/softstarters > Software

More information can be found on the Internet at:

www.usa.siemens.com/softstarters

¹⁾ U_n = Full Voltage

²⁾ U_s = Starting (Initial) Voltage

³⁾ t_R = Time Running

⁴⁾ I_e = Rated operational current

For Operation in the Control Cabinet

3RW Soft Starters

3RW44

for high-feature applications

Overview

In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements. They cover a performance range up to 900 Hp (at 460 V) in the inline circuit and up to 1600Hp (at 460 V) in the inside-delta circuit.

The SIRIUS 3RW44 soft starters are characterized by a compact design for space-saving and clearly arranged control cabinet layouts. For optimized motor starting and stopping the innovative SIRIUS 3RW44 soft starters are an attractive alternative with considerable savings potential compared to applications with a frequency converter. The new torque control and adjustable current limiting enable the High-Feature soft starters to be used in nearly every conceivable task. They guarantee the reliable avoidance of sudden torque applications and current peaks during motor starting and stopping. This creates savings potential when calculating the size of the switchgear and when servicing the machinery installed. Whether it's for inline circuits or inside-delta circuits – the SIRIUS 3RW44 soft starter offers savings especially in terms of size and equipment costs.

The bypass contacts already integrated in the soft starter bypass the thyristors after a motor ramp-up is detected. This results in a further reduction in the heat loss occurring during operation of the soft starter.

Combinations of various starting, operating and ramp-down possibilities ensure an optimum adaptation to the application-specific requirements. Operation and commissioning can be performed with the menu-controlled keypad and a menu-prompted, multi-line graphical display with background lighting. The optimized motor ramp-up and ramp-down can be effected quickly, easily and reliably by means of just a few settings with a previously selected language. Four-key operation and plain-text displays for each menu point guarantee full clarity at every moment of the parameterization and operation.

Applicable standards

- IEC 60947-4-2
- UL/CSA

Soft Starter ES parameterization software

Soft Starter ES software is used for the parameterization, monitoring and service diagnostics of SIRIUS 3RW44 High Feature soft starters.

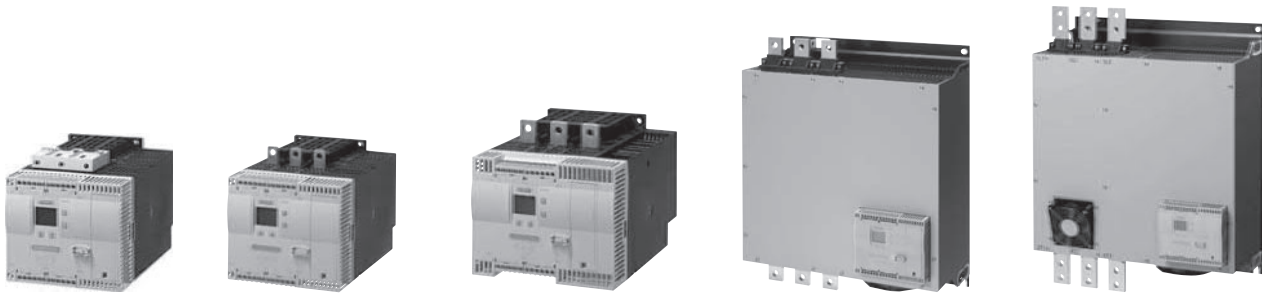
Application

The SIRIUS 3RW44 solid-state soft starters are suitable for the torque-controlled soft starting and smooth ramp-down as well as braking of three-phase asynchronous motors.

Application areas, e. g.

- Pumps
- Fans
- Compressors
- Water transport
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills
- Saws
- Crushers
- Mixers
- Centrifuges
- Industrial cooling and refrigerating systems

Selection and ordering data



3RW44 27-1BC44

3RW44 36-6BC44

3RW44 47-6BC44

3RW44 58-6BC44

3RW44 66-6BC44

Ambient temperature 50 °C					Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e							
	200 V	230 V	460 V	575 V				
A	hp	hp	hp	hp				kg
Inline circuits ²⁾ , rated operational voltage 200 ... 460 V								
26	7.5	7.5	15	--	3RW44 22-□BC□4		1 unit	6.500
32	10	10	20	--	3RW44 23-□BC□4		1 unit	6.500
42	10	15	25	--	3RW44 24-□BC□4		1 unit	6.500
51	15	15	30	--	3RW44 25-□BC□4		1 unit	6.500
68	20	20	50	--	3RW44 26-□BC□4		1 unit	6.500
82	25	25	60	--	3RW44 27-□BC□4		1 unit	6.500
Order No. supplement for connection types								
• With spring-type terminals					3			
• With screw terminals					1			
100	30	30	75	--	3RW44 34-□BC□4		1 unit	7.900
117	30	40	75	--	3RW44 35-□BC□4		1 unit	7.900
145	40	50	100	--	3RW44 36-□BC□4		1 unit	7.900
180	50	60	125	--	3RW44 43-□BC□4		1 unit	11.500
215	60	75	150	--	3RW44 44-□BC□4		1 unit	11.500
280	75	100	200	--	3RW44 45-□BC□4		1 unit	11.500
315	100	125	250	--	3RW44 46-□BC□4		1 unit	11.500
385	125	150	300	--	3RW44 47-□BC□4		1 unit	11.500
494	150	200	400	--	3RW44 53-□BC□4		1 unit	50.000
551	150	200	450	--	3RW44 54-□BC□4		1 unit	50.000
615	200	250	500	--	3RW44 55-□BC□4		1 unit	50.000
693	200	250	550	--	3RW44 56-□BC□4		1 unit	50.000
780	250	300	600	--	3RW44 57-□BC□4		1 unit	50.000
850	300	350	700	--	3RW44 58-□BC□4		1 unit	50.000
970	350	400	800	--	3RW44 65-□BC□4		1 unit	78.000
1076	350	400	900	--	3RW44 66-□BC□4		1 unit	78.000

Order No. supplement for connection types

- With spring-type terminals
- With screw terminals

Order No. supplement for the rated control supply voltage U_s ¹⁾

- 115 V AC
- 230 V AC

¹⁾ Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

²⁾ For inside delta selection, see page 7/76.

Note:

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism $J_{Load} < 10 \times J_{Motor}$; starting current 350 % $\times I_e$ for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44

for high-feature applications

Ambient temperature 50 °C					Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e							
	200 V	230 V	460 V	575 V				
A	hp	hp	hp	hp				kg
Inline circuits ²⁾ , rated operational voltage 400 ... 600 V								
26	--	--	15	20	3RW44 22-□BC□5		1 unit	6.500
32	--	--	20	25	3RW44 23-□BC□5		1 unit	6.500
42	--	--	25	30	3RW44 24-□BC□5		1 unit	6.500
51	--	--	30	40	3RW44 25-□BC□5		1 unit	6.500
68	--	--	50	50	3RW44 26-□BC□5		1 unit	6.500
82	--	--	60	75	3RW44 27-□BC□5		1 unit	6.500
Order No. supplement for connection types								
• With spring-type terminals					3			
• With screw terminals					1			
100	--	--	75	75	3RW44 34-□BC□5		1 unit	7.900
117	--	--	75	100	3RW44 35-□BC□5		1 unit	7.900
145	--	--	100	125	3RW44 36-□BC□5		1 unit	7.900
180	--	--	125	150	3RW44 43-□BC□5		1 unit	11.500
215	--	--	150	200	3RW44 44-□BC□5		1 unit	11.500
280	--	--	200	250	3RW44 45-□BC□5		1 unit	11.500
315	--	--	250	300	3RW44 46-□BC□5		1 unit	11.500
385	--	--	300	400	3RW44 47-□BC□5		1 unit	11.500
494	--	--	400	500	3RW44 53-□BC□5		1 unit	50.000
551	--	--	450	550	3RW44 54-□BC□5		1 unit	50.000
615	--	--	500	600	3RW44 55-□BC□5		1 unit	50.000
693	--	--	550	700	3RW44 56-□BC□5		1 unit	50.000
780	--	--	600	800	3RW44 57-□BC□5		1 unit	50.000
850	--	--	700	850	3RW44 58-□BC□5		1 unit	50.000
970	--	--	800	1000	3RW44 65-□BC□5		1 unit	78.000
1076	--	--	900	1100	3RW44 66-□BC□5		1 unit	78.000
Order No. supplement for connection types								
• With spring-type terminals					2			
• With screw terminals					6			
Order No. supplement for the rated control supply voltage U_s ¹⁾								
• 115 V AC						3		
• 230 V AC						4		

¹⁾ Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

²⁾ For inside delta selection, see page 7/76.

Note:

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism $J_{Load} < 10 \times J_{Motor}$; starting current 350 % $\times I_e$ for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44
for high-feature applications

1

2

3

4

5

6

7

Ambient temperature 50 °C					Order No.	List Price \$ per PU	PS*	Weight per PU approx.
Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e							
A	200 V hp	230 V hp	460 V hp	575 V hp				
								kg
Inline circuits, rated operational voltage 400 ... 690 V								
26	--	--	15	20	3RW44 22-□BC□6		1 unit	6.500
32	--	--	20	25	3RW44 23-□BC□6		1 unit	6.500
42	--	--	25	30	3RW44 24-□BC□6		1 unit	6.500
51	--	--	30	40	3RW44 25-□BC□6		1 unit	6.500
68	--	--	50	50	3RW44 26-□BC□6		1 unit	6.500
82	--	--	60	75	3RW44 27-□BC□6		1 unit	6.500
Order No. supplement for connection types					3			
• With spring-type terminals					1			
• With screw terminals								
100	--	--	75	75	3RW44 34-□BC□6		1 unit	7.900
117	--	--	75	100	3RW44 35-□BC□6		1 unit	7.900
145	--	--	100	125	3RW44 36-□BC□6		1 unit	7.900
180	--	--	125	150	3RW44 43-□BC□6		1 unit	11.500
215	--	--	150	200	3RW44 44-□BC□6		1 unit	11.500
280	--	--	200	250	3RW44 45-□BC□6		1 unit	11.500
315	--	--	250	300	3RW44 46-□BC□6		1 unit	11.500
385	--	--	300	400	3RW44 47-□BC□6		1 unit	11.500
494	--	--	400	500	3RW44 53-□BC□6		1 unit	50.000
551	--	--	450	550	3RW44 54-□BC□6		1 unit	50.000
615	--	--	500	600	3RW44 55-□BC□6		1 unit	50.000
693	--	--	550	700	3RW44 56-□BC□6		1 unit	50.000
780	--	--	600	800	3RW44 57-□BC□6		1 unit	50.000
850	--	--	700	850	3RW44 58-□BC□6		1 unit	50.000
970	--	--	800	1000	3RW44 65-□BC□6		1 unit	78.000
1076	--	--	900	1100	3RW44 66-□BC□6		1 unit	78.000

Order No. supplement for connection types

- With spring-type terminals
- With screw terminals

Order No. supplement for the rated control supply voltage U_s ¹⁾

- 115 V AC
- 230 V AC

¹⁾ Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

Note:

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism $J_{Load} < 10 \times J_{Motor}$; starting current 350 % $\times I_e$ for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures > 40 °C and switching frequency.

Introduction

Overview



SIRIUS ES engineering software (E-SW)

The programs of the SIRIUS ES software family enable:

- Clearly arranged configuring of device functions and their parameters – online and offline
- Efficient diagnostics functions and display of the most important measured values
- Time savings through shorter startup times.

The SIRIUS ES programs such as Motor Starter ES, Soft Starter ES and SIMOCODE ES are available in three versions which differ in user-friendliness, scope of functions and price (for details see the descriptions of the individual products).

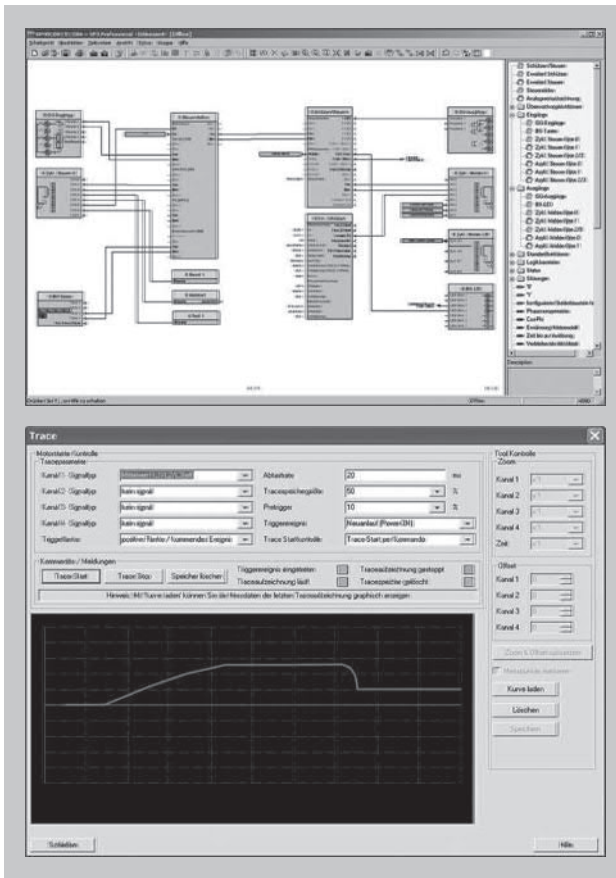
SIRIUS ES	Basic	Standard	Premium
Local interface on the device (system interface)	✓	✓	✓
Basic functions for parameterizing the devices			
• Parameter assignment	✓	✓	✓
• Operating	✓	✓	✓
• Diagnostics	✓	✓	✓
• Test	✓	✓	✓
Standard functionality			
• Parameterizing with the integrated graphics editor ¹⁾	--	✓	✓
• Creating typicals	--	✓	✓
• Exporting parameters	--	✓	✓
Complete functionality			
• Group functions	--	--	✓
• S7 Routing	--	--	✓
• Teleservice through MPI	--	--	✓
• STEP7 Object Manager	--	--	✓
PROFIBUS interface	--	--	✓

¹⁾ Depending on SIRIUS ES program.

Application

In addition to device-specific parameterization, the programs of the SIRIUS ES software family also provide the following functionality in a uniform look and feel. These functions are available in many SIRIUS ES programs.

- **Standards-conform printouts**
The programs of the SIRIUS ES software family greatly simplify machine documentation. Parameterization printouts according to EN ISO 7200 are possible. The elements to be printed are easy to select and compile as required.
- **Easy creation of parameter templates**
Parameter templates can be created for devices and applications with only minimum differences in their parameters. These templates contain all the parameters which are needed for the parameterization. In addition it is possible to specify which of these parameters are fixed and which can be customized, e. g. by the startup engineer.
- **Group function**
For the user-friendly parameterization of numerous devices or applications of the same type, the programs of the SIRIUS ES software family offer a group function which enables the parameterization of several devices to be read out or written through PROFIBUS. In conjunction with templates it is even possible to selectively adapt the same parameters in any number of parameterizations.
- **Teleservice through MPI**
The premium versions of the SIRIUS ES software families support the use of MPI Teleservice (comprising the Teleservice software and various Teleservice adapters) for remote diagnostics of the devices. This facilitates diagnostics and maintenance and it shortens response times for service purposes.



Efficient engineering and startup with graphic interfaces and diagnostics options

Types of delivery and license

The programs of the SIRIUS ES software family are available as follows:

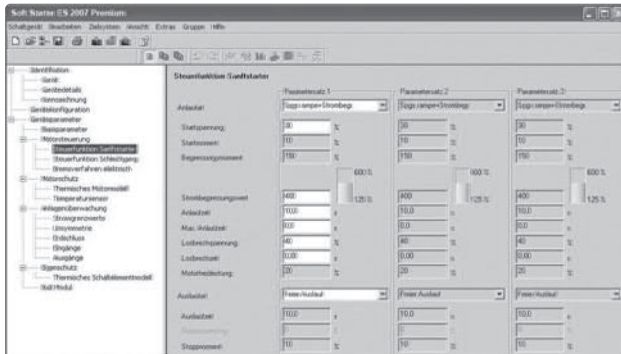
- Floating license – the license for any one user at any one time
 - Authorizes any one user
 - Independent of the number of installations (unlike the single license which is allowed to be installed once only)
 - Only the actual use of the program has to be licensed
 - Trial license (free use of all program functions for 14 days for test and evaluation purposes, included on every product CD, available in the download file of the SIRIUS ES program in the Service&Support portal).

Following delivery versions are available in addition for the programs of the SIRIUS ES software family:

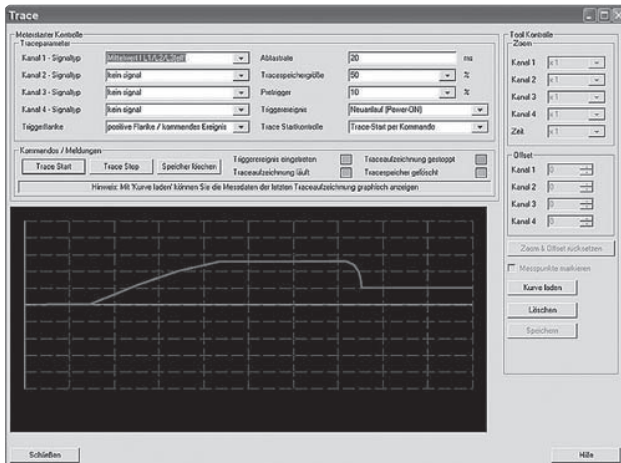
- Upgrade
Upgrade from an old to a new version with expanded functions, e. g. upgrade from Motor Starter ES 2006 to Motor Starter ES 2007
- Powerpack
Special pack for switching within the same software version to a more powerful version with more functionality, e. g. Powerpack Motor Starter ES 2007 for switching from Standard to Premium
- Software Update Service
To keep you up to date at all times we offer a special service which supplies you automatically with all service packs and upgrades

Soft Starter ES

Overview



Easy and clearly arranged parameter setting of the 3RW44 soft starter with Soft Starter ES 2007



Graphic presentation of measured values with the trace function (oscilloscope function) of Soft Starter ES 2007 Standard and Premium

Soft Starter ES 2007

The Soft Starter ES software permits the quick and easy parameterization, monitoring and diagnostics of SIRIUS 3RW44 High Feature soft starters for service purposes. The device parameters can be configured directly on the PC and transferred to the soft starter through a serial cable or an optional PROFIBUS interface.

The advantages of Soft Starter ES:

- Clearly arranged configuring of device functions and their parameters – online and offline
- Effective diagnostics functions on the soft starter and display of the most important measured values
- Trace function (oscilloscope function) for recording measured values and events (in the Soft Starter ES Standard and Premium software versions).

Efficient engineering with new program versions

The Soft Starter ES software program is available in three versions which differ in their user-friendliness, scope of functions and price.

Soft starters ES	Basic	Standard	Premium
Access through the local interface on the device	✓	✓	✓
Parameter assignment	✓	✓	✓
Operating	✓	✓	✓
Diagnostics	✓	✓	✓
Creating templates	--	✓ ¹⁾	✓
Exporting parameters	--	✓	✓
Comparison functions	--	✓	✓
Standards-conform printout according to EN ISO 7200	--	✓	✓
Service data (slave pointer, statistics data)	--	✓	✓
Access through PROFIBUS	--	--	✓
Group functions	--	--	✓
Teleservice through MPI	--	--	✓
S7 Routing	--	--	✓
STEP7 Object Manager	--	--	✓

¹⁾ Templates with Service Pack 1 and higher.

More functions

- Standards-conform printouts
The software tool greatly simplifies machine documentation. Parameterization printouts according to EN ISO 7200 are possible. The elements to be printed are easy to select and compile as required.
- Easy creation of parameter templates
Parameter templates can be created for devices and applications with only minimum differences in their parameters. These templates contain all the parameters which are needed for the parameterization. In addition it is possible to specify which of these parameters are fixed and which can be adapted, e. g. by the startup engineer.
- Group function
For the user-friendly parameterization of numerous devices or applications of the same type, the programs of the SIRIUS ES software family offer a group function which enables the parameterization of several devices to be read out or written through PROFIBUS. In conjunction with typical it is even possible to selectively adapt the same parameters in any number of parameterizations.
- Teleservice through MPI
The Soft Starter ES Premium version supports the use of MPI Teleservice (comprising the Teleservice software and various Teleservice adapters) for remote diagnostics of the devices. This facilitates diagnostics and maintenance, and it shortens response times for service purposes.

Types of delivery and license

Soft Starter ES is available as follows:

- Floating license – the license for any one user at any one time
 - Authorizes any one user
 - Independent of the number of installations (unlike the single license which is allowed to be installed once only)
 - Only the actual use of the program has to be licensed
- Trial license (free use of all program functions for 14 days for test and evaluation purposes, included on every product CD, available in the download file of the SIRIUS ES program in the Service&Support portal).

Following delivery versions are available in addition for Soft Starter ES 2007:

- Upgrade
Upgrade from an old to a new version with expanded functions, e. g. upgrade from Soft Starter ES 2006 to Soft Starter ES 2007

- Powerpack
Special pack for switching within the same software version to a more powerful version with more functionality, e. g. Powerpack Soft Starter ES 2007 for switching from Standard to Premium
- Software Update Service
To keep you up to date at all times we offer a special service which supplies you automatically with all service packs and upgrades

New licensing procedure

To make licensing easier, the three versions of Soft Starter ES are available with immediate effect with the following license:

14 day trial license for Premium functions:
for test and evaluation purposes, included on every product CD, available also in the download file of the SIRIUS Soft Starter ES 2007 program at www.sea.siemens.com/softstarters.

System requirements

Soft Starter ES 2007 parameterization, start-up and diagnostics software for the SIRIUS 3RW44 soft starter	Basic/Standard	Premium
	Firmware version \geq *E04* ¹⁾	Firmware version \geq *E06* ²⁾
Operating system	Windows 2000 (Service Pack 3 or 4), Windows XP Professional (Service Pack 2), Windows Vista Ultimate 32/ Business 32 ³⁾	
Processor	\geq Pentium 800 MHz/ \geq 1 GHz (Windows Vista)	
RAM	\geq 512 MB/ \geq 1 GB (Windows Vista)	
Free space on hard disk	\geq 150 MB	
CD-ROM/DVD drive	Yes (only when installing from CD)	
Serial interface (COM)	Yes	
PC cable/parameterization cable/connection cable	Yes	
PROFIBUS communication module (optional)	--	Yes

¹⁾ SIRIUS 3RW44 with firmware version \geq *E04*. Installed in starters delivered after December 2005.

²⁾ SIRIUS 3RW44 with firmware version \geq *E06*. Installed in starters delivered after May 2006.

³⁾ Windows Vista Ultimate 32/ Business 32 from Soft Starter ES 2007+SP1.

Selection and ordering data

Parameterization and service software for SIRIUS 3RW44 soft starters

- Can be run under WIN 2000/WIN XP PROF/Windows Vista Ultimate 32/Business 32
- Without PC cable

Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Soft Starter ES 2007 Basic				
Floating license for one user E-SW, software and documentation on CD, 3 languages (German/English/French), communication through system interface • License key on USB stick, Class A, including CD				
	3ZS1 313-4CC10-0YA5		1 unit	0.230
Soft Starter ES 2007 Standard				
Floating license for one user E-SW, software and documentation on CD, 3 languages (German/English/French), communication through system interface • License key on USB stick, Class A, including CD				
	3ZS1 313-5CC10-0YA5		1 unit	0.230

Planning and Configuration with SIRIUS

Soft Starter ES

Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Upgrade for Soft Starter ES 2006 Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface	3ZS1 313-5CC10-0YE5		1 unit	0.230
Powerpack for Soft Starter ES 2007 Basic Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface	3ZS1 313-5CC10-0YD5		1 unit	0.230
Software Update Service For 1 year with automatic extension, assuming the current software version is in use, E-SW, software and documentation on CD, communication through the system interface	3ZS1 313-5CC10-0YL5		1 unit	0.230

Soft Starter ES 2007 Premium

Floating license for one user E-SW, software and documentation on CD, 3 languages (German/English/French), communication through system interface or PROFIBUS • License key on USB stick, Class A, including CD	3ZS1 313-6CC10-0YA5		1 unit	0.230
Upgrade for Soft Starter ES 2006 Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface or PROFIBUS	3ZS1 313-6CC10-0YE5		1 unit	0.230
Powerpack for Soft Starter ES 2007 Standard Floating license for one user, E-SW, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface or PROFIBUS	3ZS1 313-6CC10-0YD5		1 unit	0.230
Software Update Service For 1 year with automatic extension, assuming the current software version is in use, E-SW, software and documentation on CD, communication through the system interface or PROFIBUS	3ZS1 313-6CC10-0YL5		1 unit	0.230

PC cables



3UF7 940-0AA00-0

For PC/PG communication with SIRIUS 3RW44 soft starters

Through the system interface, for connecting to the serial interface of the PC/PG

3UF7 940-0AA00-0 1 unit 0.150

Serial/USB







For PC/PG communication with SIRIUS 3RW44 soft starters

Through the system interface, for connecting to the USB interface of the PC/PG

3UF7 946-0AA00-0 1 unit 0.150

Accessories


	For soft starters	Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type						
PROFIBUS communication modules						
	Modules can be plugged into the soft starters for integrating the starters in the PROFIBUS network with DPV1 slave functionality. On Y-link the soft starter has only DPV0 slave functionality.		3RW49 00-0KC00		1 unit	0.320
3RW49 00-0KC00						
PROFINET communication modules						
	For 3RW44 soft starter integration in the PROFINET network, suitable for devices with firmware version E12 or higher		3RW49 00-0NC00		1 unit	0.320
3RW49 00-0NC00						
External display and operator modules						
	For indicating and operating the functions provided by the soft starter using an externally mounted display and operator module in degree of protection IP54, N1, N12 (e. g. in the control cabinet door)		3RW49 00-0AC00		1 unit	0.320
3RW49 00-0AC00						
Connection cables						
From the device interface (serial) of the 3RW44 soft starter to the external display and operator module						
<ul style="list-style-type: none">Length 0.5 m, flatLength 0.5 m, roundLength 1.0 m, roundLength 2.5 m, round			3UF7 932-0AA00-0		1 unit	0.020
			3UF7 932-0BA00-0		1 unit	0.050
			3UF7 937-0BA00-0		1 unit	0.100
			3UF7 933-0BA00-0		1 unit	0.150
Box terminal blocks for soft starters						
Box terminal blocks						
3RW44 2. Included in the scope of supply						
3RW44 3. <ul style="list-style-type: none">Up to 70 mm²Up to 120 mm²			3RT19 55-4G		1 unit	0.230
			3RT19 56-4G		1 unit	0.260
3RW44 4. <ul style="list-style-type: none">Up to 240 mm²			3RT19 66-4G		1 unit	0.676
						
3RT19						

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Spare parts

For soft starters	Version	Order No.	List Price \$ per PU	PS*	Weight per PU approx. kg
Type					
Covers for soft starters					
Terminal covers for box terminals					
Additional touch protection to be fitted at the box terminals (2 units required per device)					
3RW44 2. and 3RW44 3.		3RT19 56-4EA2		1 unit	0.030
3RW44 4.		3RT19 66-4EA2		1 unit	0.040
Terminal covers for cable lugs and busbar connections					
3RW44 2. and 3RW44 3.		3RT19 56-4EA1		1 unit	0.070
3RW44 4.		3RT19 66-4EA1		1 unit	0.130
Operating instructions¹⁾					
For 3RW44 soft starters		3ZX10 12-0RW44-1AA1			
Fans					
Fans					
	3RW44 2. and 115 V AC	3RW49 36-8VX30		1 unit	0.300
	3RW44 3. 230 V AC	3RW49 36-8VX40		1 unit	0.300
	3RW44 4. 115 V AC	3RW49 47-8VX30		1 unit	0.500
	230 V AC	3RW49 47-8VX40		1 unit	0.500
	3RW44 5. and 115 V AC	3RW49 57-8VX30		1 unit	0.800
	3RW44 6. ²⁾ 230 V AC	3RW49 57-8VX40		1 unit	0.800
	3RW44 6. ³⁾ 115 V AC	3RW49 66-8VX30		1 unit	0.300
	230 V AC	3RW49 66-8VX40		1 unit	0.300

¹⁾ The operating instructions are included in the scope of supply.

²⁾ 3RW44 6. mounting on output side.

³⁾ For mounting on front side.

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n \text{ motor}}$).

The soft starter rating can be selected to be as high as the rating of the motor used.

Application	Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
Starting parameters¹⁾						
• Voltage ramp and current limiting						
- Starting voltage %	70	60	50	30	30	30
- Starting time s	10	10	10	10	10	10
- Current limit value	Deactivated	Deactivated	$4 \times I_M$	$4 \times I_M$	Deactivated	Deactivated
• Torque ramp						
- Starting torque	60	50	40	20	10	10
- End torque	150	150	150	150	150	150
- Starting time	10	10	10	10	10	10
• Breakaway pulse	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
Ramp-down mode	Smooth ramp-down	Smooth ramp-down	Free ramp-down	Free ramp-down	Pump ramp-down	Free ramp-down

Application examples for heavy starting (Class 20)

Heavy starting Class 20 (up to 40 s with 350 % $I_{n \text{ motor}}$).

The soft starter has to be selected one rating class higher than the motor used.

Application	Mixer	Centrifuge	Milling machine
Starting parameters¹⁾			
• Voltage ramp and current limiting			
- Starting voltage %	30	30	30
- Starting time s	30	30	30
- Current limit value	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
• Torque ramp			
- Starting torque	30	30	30
- End torque	150	150	150
- Starting time	30	30	30
• Breakaway pulse	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
Ramp-down mode	Free ramp-down	Free ramp-down	Free ramp-down or DC braking

Application examples for very heavy starting (Class 30)

Very heavy starting Class 30 (up to 60 s with 350 % $I_{n \text{ motor}}$).

The soft starter has to be selected two rating classes higher than the motor used.

Application	Large fan	Mill	Crushers	Circular saw/bandsaw
Starting parameters¹⁾				
• Voltage ramp and current limiting				
- Starting voltage %	30	50	50	30
- Starting time s	60	60	60	60
- Current limit value	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
• Torque ramp				
- Starting torque	20	50	50	20
- End torque	150	150	150	150
- Starting time	60	60	60	60
• Breakaway pulse	Deactivated (0 ms)	80 %, 300 ms	80 %, 300 ms	Deactivated (0 ms)
Ramp-down mode	Free ramp-down	Free ramp-down	Free ramp-down	Free ramp-down

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during start-up.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

¹⁾ Actual motor starting times are load dependent.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44

for high-feature applications

Circuit concept

The SIRIUS 3RW44 soft starters can be operated in two different types of circuit.

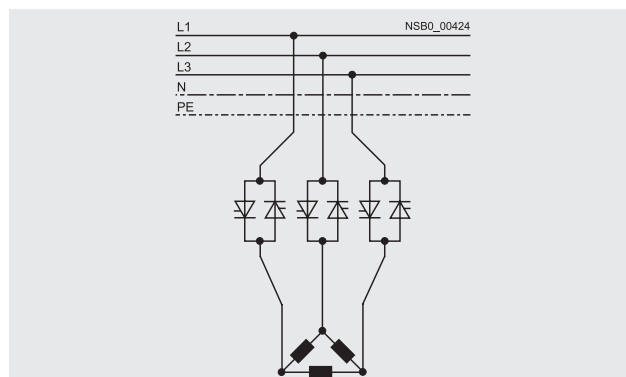
- **Inline circuit**

The controls for isolating and protecting the motor are simply connected in series with the soft starter. The motor is connected to the soft starter with three cables.

- **Inside-delta circuit**

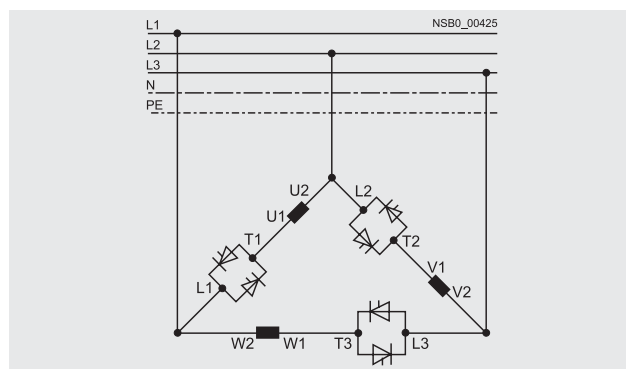
The wiring is similar to that of wye-delta starters. The phases of the soft starter are connected in series with the individual motor windings. The soft starter then only has to carry the phase current, amounting to about 58 % of the rated motor current (conductor current).

Comparison of the types of circuit



Inline circuit:

Rated current I_g corresponds to the rated motor current I_n , 3 cables to the motor



Inside-delta circuit:

Rated current I_g corresponds to approx. 58 % of the rated motor current I_n , 6 cables to the motor (as with wye-delta starters)

Which circuit?

Using the inline circuit involves the lowest wiring outlay. If the soft starter to motor connections are long, this circuit is preferable. With the inside-delta circuit there is double the wiring complexity but a smaller size of device can be used at the same rating. It is also recommended to use an isolating contactor in series with each motor winding.

Thanks to the choice of operating mode between the inline circuit and inside-delta circuit, it is always possible to select the most favorable solution.

The braking function is possible only in the inline circuit.

Configuration

The 3RW44 solid-state soft starters are designed for normal starting. In case of heavy starting or increased starting frequency, a larger device must be selected.

For long starting times it is recommended to have a PTC sensor in the motor. This also applies for the ramp-down modes smooth ramp-down, pump ramp-down and DC braking, because during the ramp-down time in these modes, an additional current load applies in contrast to free ramp-down.

In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately.

A bypass contact system and solid-state overload relay are already integrated in the 3RW44 soft starter and therefore do not have to be ordered separately.

The harmonic component load for starting currents must be taken into consideration for the selection of motor starter protectors (selection of release).

Note:

When induction motors are switched on, voltage drops normally appear on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Device interface, PROFIBUS DP communication module, Soft Starter ES parameterizing and operating software

The 3RW44 electronic soft starters have a PC interface for communicating with the Soft Starter ES software or for connecting the external display and operator module. If the optional PROFIBUS communication module is used, the 3RW44 soft starter can be integrated in the PROFIBUS network and communicate using the GSD file or Soft Starter ES Premium software.

System Manual for SIRIUS 3RW44

Besides containing all important information on configuring, commissioning and servicing, the manual also contains example circuits and the technical specifications for all devices. This manual can be downloaded off the internet.

Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded free of charge from:

www.usa.siemens.com/softstarters > Software

More information can be found on the Internet at:

www.usa.siemens.com/softstarters

For Operation in the Control Cabinet

3RW Soft Starters

Soft starters for enclosed applications

Overview

The family of 3RW40 and 3RW44 softstarters are available in stand alone enclosed control designs for smooth starting and stopping of standard NEMA design B three phase inductive motors, thus eliminating physical stresses to the system and load while minimizing starting current. These pre-engineered enclosed designs offer convenience and flexibility in and UL/CSA certified offering. Enclosed styles are available in combination and non-combination configurations through 600HP and system voltages of 200V, 230V, 480V, and 600V.

The Class 73 offers either the 3RW40 or 3RW44 in a non-combination style offering. These non-combination styles come standard with a choice of Type 1, 3R, 12, 4 NEMA rated enclosure, a control transformer, Sirius softstarter with built-in overload and bypass, line side power terminal block, and a reset pushbutton. The enclosed offering can be powerfully matched with a wide variety of factory modified options such as pushbutton control, pilot lights, metering and other control options such as isolation contactors and emergency start bypass starters. 3RW44 enclosed styles are also available with optional through the door keypad and Profibus communication.

The Class 74 offering includes all of the features of the Class 73 in a combination style design. Standard options are either a circuit breaker or fusible disconnect providing short circuit protection and soft starting in one package.

Application

The Class 73/74 product is a fully enclosed solid state reduced voltage starter designed for a wide variety of industrial applications. The enclosed softstarter offerings are ideal for new as well as existing applications where total motor controls is required.

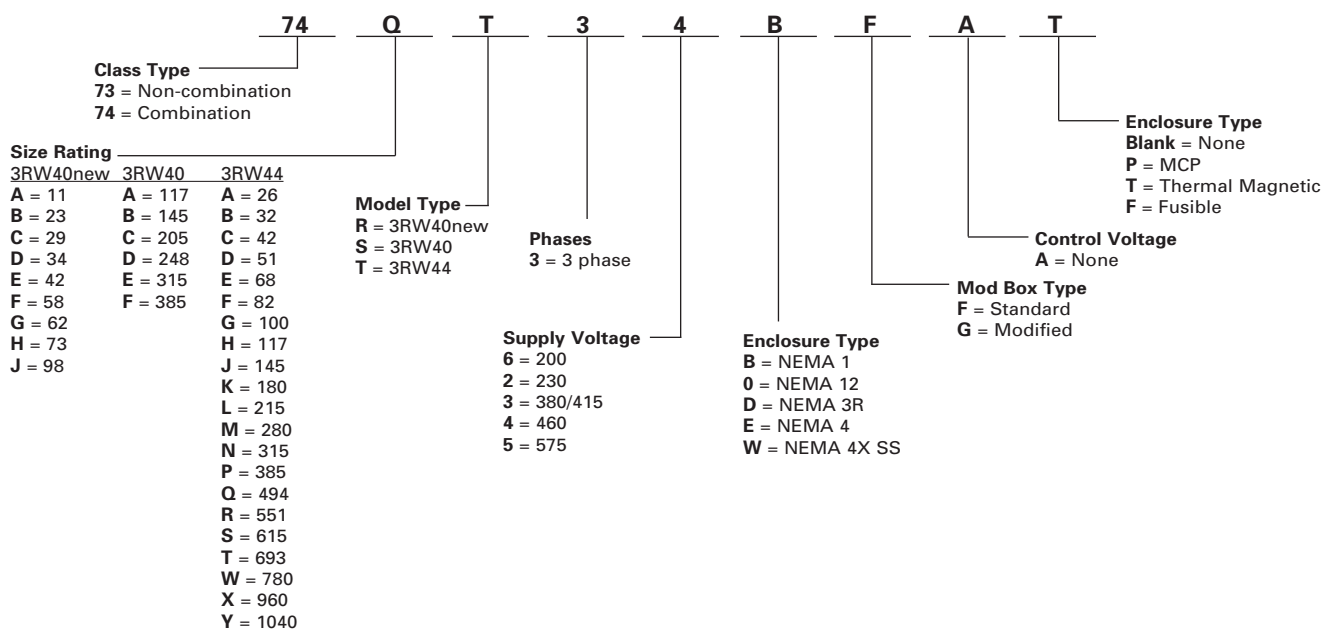
Proper selection based on application data is made simple following these easy steps:

- Select proper RVSS by application
 - Select the 3RW40 versus the 3RW44 using the application info provided in the open section of the catalog
- Select the rating chart for normal starting or severe duty starting
 - Normal starting is rated at 350% of rated motor current IM for 10 seconds and based on starts per hour – representative of a class 20 application.
 - Severe starting is rated at 350% of rated motor current Im for 20 seconds and based on starts per hour – representative of a Class 20 application
- Select model using Motor nameplate data
 - Identify correct motor voltage column
 - Select rate current or HP row
 - Find ordering number under desired enclosure type column (e.g. NEMA 1)
 - Select appropriate system voltage
- Select factory modification on page 6/40¹⁾

Example:
3RW44, N12, CB disconnect, 460V, 200HP with a start/stop and red run light

Order No.
74MT34BFAP A1 FC

Product Nomenclature



¹⁾ Some modifications will require a larger 'Modified' box than the standard box e.g. Isolation contactor, space heater, etc. See page 7/43 for instructions.



3RW40 Enclosed features:

- Available in NEMA 1,12,3R,4, and 4 stainless steel
- Compact size
- Built-in Bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550%
- Internal overload class 10,15,or 20
- Internal self protection
- Fault monitoring
- Isolation Contactor

Ordering Information

- ▶ Enclosed devices should be ordered by the FLA of the motor.
- ▶ The 3RW40 is designed for normal starting applications.
- ▶ For factory modifications see page 7/43.
- ▶ For complete derating and application info see page 7/59
- ▶ For dimensional drawings see page 7/95.

Ideal applications for 3RW40 enclosed softstarters

- Fans
- Pumps
- Easy starting loads starting in less than 10 seconds

Class 73 starters are built to UL and CSA standards

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control Circuit Transformer
- Line side power terminal block
- Reset button
- Isolation Contactor

3RW40 for Standard Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Ie for 10s) ^②									
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
11	3	3	7.5	—	6	3RW4024-1BB14	73AR3_BFA		73AR3_DFA		73AR3_OFA		73AR3_EFA		73AR3_WFA
23	5	7.5	15	—	13	3RW4026-1BB14	73BR3_BFA		73BR3_DFA		73BR3_OFA		73BR3_EFA		73BR3_WFA
29	7.5	10	20	—	16	3RW4027-1BB14	73CR3_BFA		73CR3_DFA		73CR3_OFA		73CR3_EFA		73CR3_WFA
34	10	10	25	—	18	3RW4028-1BB14	73DR3_BFA		73DR3_DFA		73DR3_OFA		73DR3_EFA		73DR3_WFA
42	10	15	30	—	23	3RW4036-1BB14	73ER3_BFA		73ER3_DFA		73ER3_OFA		73ER3_EFA		73ER3_WFA
58	15	20	40	—	31	3RW4037-1BB14	73FR3_BFA		73FR3_DFA		73FR3_OFA		73FR3_EFA		73FR3_WFA
62	20	20	40	—	33	3RW4038-1BB14	73GR3_BFA		73GR3_DFA		73GR3_OFA		73GR3_EFA		73GR3_WFA
73	20	25	50	—	39	3RW4046-1BB14	73HR3_BFA		73HR3_DFA		73HR3_OFA		73HR3_EFA		73HR3_WFA
98	30	30	75	—	52	3RW4047-1BB14	73JR3_BFA		73JR3_DFA		73JR3_OFA		73JR3_EFA		73JR3_WFA
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4

^① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C

^② Starter selection is dependent on type of application. Ie = FLA rating of motor

For Operation in the Control Cabinet

3RW Soft Starters

• Revised •
07/20/15

Enclosed 3RW40



3RW40 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550 %
- Internal overload class 10, 15, or 20
- Internal self protection
- Fault monitoring

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW40 is designed for normal starting applications (Class 10 applications).
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/59.
- For dimensional drawings see page 7/95.

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control circuit transformer
- Line side power terminal block
- Reset button

Ideal applications for 3RW40 enclosed softstarters:

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines

Class 73 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

3RW40 for Standard Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Im for 10s) ^②									
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
117	30	40	75	—	56	3RW4055-6BB34	73AS3_BFA		73AS3_DFA		73AS3_0FA		73AS3_EFA		73AS3_WFA
145	40	50	100	—	75	3RW4056-6BB34	73BS3_BFA		73BS3_DFA		73BS3_0FA		73BS3_EFA		73BS3_WFA
205	60	75	150	—	112	3RW4073-6BB34	73CS3_BFA		73CS3_DFA		73CS3_0FA		73CS3_EFA		73CS3_WFA
248	75	100	200	—	149	3RW4074-6BB34	73DS3_BFA		73DS3_DFA		73DS3_0FA		73DS3_EFA		73DS3_WFA
315	100	125	250	—	186	3RW4075-6BB34	73ES3_BFA		73ES3_DFA		73ES3_0FA		73ES3_EFA		73ES3_WFA
385	125	150	300	—	224	3RW4076-6BB34	73FS3_BFA		73FS3_DFA		73FS3_0FA		73FS3_EFA		73FS3_WFA
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
117	—	—	75	100	—	3RW4055-6BB35	73AS35BFA		73AS35DFA		73AS350FA		73AS35EFA		73AS35WFA
145	—	—	100	150	—	3RW4056-6BB35	73BS35BFA		73BS35DFA		73BS350FA		73BS35EFA		73BS35WFA
205	—	—	150	200	—	3RW4073-6BB35	73CS35BFA		73CS35DFA		73CS350FA		73CS35EFA		73CS35WFA
248	—	—	200	250	—	3RW4074-6BB35	73DS35BFA		73DS35DFA		73DS350FA		73DS35EFA		73DS35WFA
315	—	—	250	300	—	3RW4075-6BB35	73ES35BFA		73ES35DFA		73ES350FA		73ES35EFA		73ES35WFA
385	—	—	300	400	—	3RW4076-6BB35	73FS35BFA		73FS35DFA		73FS350FA		73FS35EFA		73FS35WFA

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP ^①				KW	Class 20 Severe Duty (350% * Ie for 20s) ^②									
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
112	30	40	75	—	56	3RW4055-6BB34	73AS3_BFA		73AS3_DFA		73AS3_0FA		73AS3_EFA		73AS3_WFA
132	40	50	100	—	75	3RW4056-6BB34	73BS3_BFA		73BS3_DFA		73BS3_0FA		73BS3_EFA		73BS3_WFA
185	60	60	125	—	93	3RW4073-6BB34	73CS3_BFA		73CS3_DFA		73CS3_0FA		73CS3_EFA		73CS3_WFA
205	60	75	150	—	112	3RW4074-6BB34	73DS3_BFA		73DS3_DFA		73DS3_0FA		73DS3_EFA		73DS3_WFA
280	75	100	200	—	149	3RW4075-6BB34	73ES3_BFA		73ES3_DFA		73ES3_0FA		73ES3_EFA		73ES3_WFA
340	100	125	250	—	186	3RW4076-6BB34	73FS3_BFA		73FS3_DFA		73FS3_0FA		73FS3_EFA		73FS3_WFA
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
112	—	—	75	75	—	3RW4055-6BB35	73AS35BFA		73AS35DFA		73AS350FA		73AS35EFA		73AS35WFA
132	—	—	100	125	—	3RW4056-6BB35	73BS35BFA		73BS35DFA		73BS350FA		73BS35EFA		73BS35WFA
185	—	—	125	150	—	3RW4073-6BB35	73CS35BFA		73CS35DFA		73CS350FA		73CS35EFA		73CS35WFA
205	—	—	150	200	—	3RW4074-6BB35	73DS35BFA		73DS35DFA		73DS350FA		73DS35EFA		73DS35WFA
280	—	—	200	250	—	3RW4075-6BB35	73ES35BFA		73ES35DFA		73ES350FA		73ES35EFA		73ES35WFA
340	—	—	250	300	—	3RW4076-6BB35	73FS35BFA		73FS35DFA		73FS350FA		73FS35EFA		73FS35WFA

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor.

HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.



- 3RW40 Enclosed features:
- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
 - Compact size
 - Built-in Bypass contactor
 - Voltage ramp up and ramp down
 - Current limit adjustment of 125 - 550%
 - Internal overload class 10, 15, or 20
 - Internal self protection
 - Fault monitoring
 - Isolation Contactor

Ordering Information

- ▶ Enclosed devices should be ordered by the FLA of the motor.
- ▶ The 3RW40 is designed for normal starting applications.
- ▶ For factory modifications see page 7/43.
- ▶ For complete derating and application info see page 7/59
- ▶ For dimensional drawings see page 7/95.

Ideal applications for 3RW40 enclosed softstarters

- Fans
- Pumps
- Easy starting loads starting in less than 10 seconds

Class 74 starters are built to UL and CSA standards

- Class 74 non-combination starters include:
- NEMA rated enclosure
 - Circuit Breaker disconnect with shunt trip
 - 3RW40 Sirius softstarter with built-in OL and bypass
 - Control Circuit Transformer
 - Isolation Contactor

3RW40 for Standard Applications

Enclosed Circuit Breaker Combination (Starter With Circuit Breaker Disconnect)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Ie for 10s) ^②										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
11	3	3	7.5	—	6	3RW4024-1BB14	74AR3_BFAP		74AR3_DFAP		74AR3_OFAP		74AR3_EFAP		74AR3_WFAP	
23	5	7.5	15	—	13	3RW4026-1BB14	74BR3_BFAP		74BR3_DFAP		74BR3_OFAP		74BR3_EFAP		74BR3_WFAP	
29	7.5	10	20	—	16	3RW4027-1BB14	74CR3_BFAP		74CR3_DFAP		74CR3_OFAP		74CR3_EFAP		74CR3_WFAP	
34	10	10	25	—	18	3RW4028-1BB14	74DR3_BFAP		74DR3_DFAP		74DR3_OFAP		74DR3_EFAP		74DR3_WFAP	
42	10	15	30	—	23	3RW4036-1BB14	74ER3_BFAP		74ER3_DFAP		74ER3_OFAP		74ER3_EFAP		74ER3_WFAP	
58	15	20	40	—	31	3RW4037-1BB14	74FR3_BFAP		74FR3_DFAP		74FR3_OFAP		74FR3_EFAP		74FR3_WFAP	
62	20	20	40	—	33	3RW4038-1BB14	74GR3_BFAP		74GR3_DFAP		74GR3_OFAP		74GR3_EFAP		74GR3_WFAP	
73	20	25	50	—	39	3RW4046-1BB14	74HR3_BFAP		74HR3_DFAP		74HR3_OFAP		74HR3_EFAP		74HR3_WFAP	
98	30	30	75	—	52	3RW4047-1BB14	74JR3_BFAP		74JR3_DFAP		74JR3_OFAP		74JR3_EFAP		74JR3_WFAP	
						200V	6		6		6		6		6	
						230V	2		2		2		2		2	
						380V	3		3		3		3		3	
						460V	4		4		4		4		4	

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor.
HPs are for reference only. Enclosed ratings are at 40°C

② Starter selection is dependent on type of application. Ie = FLA rating of motor

Enclosed 3RW44



3RW40 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550%
- Internal overload class 10, 15, or 20
- Internal self protection
- Fault monitoring

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW40 is designed for normal starting applications (Class 10 applications).
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.

Class 74 non-combination starters include:

- NEMA rated enclosure
- Circuit breaker disconnect with shunt trip
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control circuit transformer

Ideal applications for 3RW40 enclosed softstarters:

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines

Class 74 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

3RW40 for Standard Applications

Enclosed Circuit Breaker Combination (Starter with Circuit Breaker Disconnect)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Im for 10s) ^②										
	200V	230V	460V	575V		380V	OPEN Style (Starter Only)	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
117	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAP			74AS3_DFAP		74AS3_OFAP		74AS3_EFAP		74AS3_WFAP
145	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAP			74BS3_DFAP		74BS3_OFAP		74BS3_EFAP		74BS3_WFAP
205	60	75	150	—	112	3RW4073-6BB34	74CS3_BFAP			74CS3_DFAP		74CS3_OFAP		74CS3_EFAP		
248	75	100	200	—	149	3RW4074-6BB34	74DS3_BFAP			74DS3_DFAP		74DS3_OFAP		74DS3_EFAP		
315	100	125	250	—	186	3RW4075-6BB34	74ES3_BFAP			74ES3_DFAP		74ES3_OFAP		74ES3_EFAP		
385	125	150	300	—	224	3RW4076-6BB34	74FS3_BFAP			74FS3_DFAP		74FS3_OFAP		74FS3_EFAP		
						200V	6			6		6		6		6
						230V	2			2		2		2		2
						380V	3			3		3		3		3
						460V	4			4		4		4		4
117	—	—	75	100	—	3RW4055-6BB35	74AS35BFAP			74AS35DFAP		74AS350FAP		74AS35EFAP		74AS35WFAP
145	—	—	100	150	—	3RW4056-6BB35	74BS35BFAP			74BS35DFAP		74BS350FAP		74BS35EFAP		74BS35WFAP
205	—	—	150	200	—	3RW4073-6BB35	74CS35BFAP			74CS35DFAP		74CS350FAP		74CS35EFAP		
248	—	—	200	250	—	3RW4074-6BB35	74DS35BFAP			74DS35DFAP		74DS350FAP		74DS35EFAP		
315	—	—	250	300	—	3RW4075-6BB35	74ES35BFAP			74ES35DFAP		74ES350FAP		74ES35EFAP		
385	—	—	300	400	—	3RW4076-6BB35	74FS35BFAP			74FS35DFAP		74FS350FAP		74FS35EFAP		

Enclosed Circuit Breaker Combination (Starter with Circuit Breaker Disconnect)

Rated Operating Current	MAX HP ^①				KW 380V	Class 20 Severe Duty (350% * Ie for 20s) ^②										
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
112	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAP		74AS3_DFAP		74AS3_OFAP		74AS3_EFAP		74AS3_WFAP	
132	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAP		74BS3_DFAP		74BS3_OFAP		74BS3_EFAP		74BS3_WFAP	
185	60	60	125	—	93	3RW4073-6BB34	74CS3_BFAP		74CS3_DFAP		74CS3_OFAP		74CS3_EFAP			
205	60	75	150	—	112	3RW4074-6BB34	74DS3_BFAP		74DS3_DFAP		74DS3_OFAP		74DS3_EFAP			
280	75	100	200	—	149	3RW4075-6BB34	74ES3_BFAP		74ES3_DFAP		74ES3_OFAP		74ES3_EFAP			
340	100	125	250	—	186	3RW4076-6BB34	74FS3_BFAP		74FS3_DFAP		74FS3_OFAP		74FS3_EFAP			
						200V	6		6		6		6		6	
						230V	2		2		2		2		2	
						380V	3		3		3		3		3	
						460V	4		4		4		4		4	
112	—	—	75	75	—	3RW4055-6BB35	74AS35BFAP		74AS35DFAP		74AS350FAP		74AS35EFAP		74AS35WFAP	
132	—	—	100	125	—	3RW4056-6BB35	74BS35BFAP		74BS35DFAP		74BS350FAP		74BS35EFAP		74BS35WFAP	
185	—	—	125	150	—	3RW4073-6BB35	74CS35BFAP		74CS35DFAP		74CS350FAP		74CS35EFAP			
205	—	—	150	200	—	3RW4074-6BB35	74DS35BFAP		74DS35DFAP		74DS350FAP		74DS35EFAP			
280	—	—	200	250	—	3RW4075-6BB35	74ES35BFAP		74ES35DFAP		74ES350FAP		74ES35EFAP			
340	—	—	250	300	—	3RW4076-6BB35	74FS35BFAP		74FS35DFAP		74FS350FAP		74FS35EFAP			

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.



3RW40 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in Bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550%
- Internal overload class 10,15, or 20
- Internal self protection
- Fault monitoring
- Isolation Contactor

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW40 is designed for normal starting applications.
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/59
- For dimensional drawings see page 7/95.

Ideal applications for 3RW40 enclosed softstarters

- Fans
- Pumps
- Easy starting loads starting in less than 10 seconds

Class 74 starters are built to UL and CSA standards

Class 73 non-combination starters include:

- NEMA rated enclosure
- Fusible Disconnect
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control Circuit Transformer
- Isolation Contactor

3RW40 for Standard Applications

Enclosed Fusible Combination (Starter With Fusible Disconnect)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * I _e for 10s) ^②									
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
11	3	3	7.5	—	6	3RW4024-1BB14	74AR3_BFAF		74AR3_DFAF		74AR3_OFAF		74AR3_EFAF		74AR3_WFAF
23	5	7.5	15	—	13	3RW4026-1BB14	74BR3_BFAF		74BR3_DFAF		74BR3_OFAF		74BR3_EFAF		74BR3_WFAF
29	7.5	10	20	—	16	3RW4027-1BB14	74CR3_BFAF		74CR3_DFAF		74CR3_OFAF		74CR3_EFAF		74CR3_WFAF
34	10	10	25	—	18	3RW4028-1BB14	74DR3_BFAF		74DR3_DFAF		74DR3_OFAF		74DR3_EFAF		74DR3_WFAF
42	10	15	30	—	23	3RW4036-1BB14	74ER3_BFAF		74ER3_DFAF		74ER3_OFAF		74ER3_EFAF		74ER3_WFAF
58	15	20	40	—	31	3RW4037-1BB14	74FR3_BFAF		74FR3_DFAF		74FR3_OFAF		74FR3_EFAF		74FR3_WFAF
62	20	20	40	—	33	3RW4038-1BB14	74GR3_BFAF		74GR3_DFAF		74GR3_OFAF		74GR3_EFAF		74GR3_WFAF
73	20	25	50	—	39	3RW4046-1BB14	74HR3_BFAF		74HR3_DFAF		74HR3_OFAF		74HR3_EFAF		74HR3_WFAF
98	30	30	75	—	52	3RW4047-1BB14	74JR3_BFAF		74JR3_DFAF		74JR3_OFAF		74JR3_EFAF		74JR3_WFAF
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor.
HPs are for reference only. Enclosed ratings are at 40°C

② Starter selection is dependent on type of application. I_e = FLA rating of motor

Enclosed 3RW44



3RW40 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Voltage ramp up and ramp down
- Current limit adjustment of 125 - 550%
- Internal overload class 10, 15, or 20
- Internal self protection
- Fault monitoring

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW40 is designed for normal starting applications (Class 10 applications).
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.

Class 74 combination starters include:

- NEMA rated enclosure
- Fusible disconnect
- 3RW40 Sirius softstarter with built-in OL and bypass
- Control circuit transformer

Ideal applications for 3RW40 enclosed softstarters:

- Fans
- Pumps
- Building/construction machines
- Presses
- Escalators
- Transport systems
- Air conditioning systems
- Ventilators
- Assembly lines

Class 74 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

3RW40 for Standard Applications

Enclosed Fusible Combination (Starter with Fusible Disconnect)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Im for 10s) ^②										
	200V	230V	460V	575V	380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
117	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAF		74AS3_DFAF		74AS3_0FAF		74AS3_EFAF		74AS3_WFAF	
145	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAF		74BS3_DFAF		74BS3_0FAF		74BS3_EFAF		74BS3_WFAF	
205	60	75	150	—	112	3RW4073-6BB34	74CS3_BFAF		74CS3_DFAF		74CS3_0FAF		74CS3_EFAF			
248	75	100	200	—	149	3RW4074-6BB34	74DS3_BFAF		74DS3_DFAF		74DS3_0FAF		74DS3_EFAF			
315	100	125	250	—	186	3RW4075-6BB34	74ES3_BFAF		74ES3_DFAF		74ES3_0FAF		74ES3_EFAF			
385	125	150	300	—	224	3RW4076-6BB34	74FS3_BFAF		74FS3_DFAF		74FS3_0FAF		74FS3_EFAF			
						200V	6		6		6		6		6	
						230V	2		2		2		2		2	
						380V	3		3		3		3		3	
						460V	4		4		4		4		4	
117	—	—	75	100	—	3RW4055-6BB35	74AS35BFAF		74AS35DFAF		74AS350FAF		74AS35EFAF		74AS35WFAF	
145	—	—	100	150	—	3RW4056-6BB35	74BS35BFAF		74BS35DFAF		74BS350FAF		74BS35EFAF		74BS35WFAF	
205	—	—	150	200	—	3RW4073-6BB35	74CS35BFAF		74CS35DFAF		74CS350FAF		74CS35EFAF			
248	—	—	200	250	—	3RW4074-6BB35	74DS35BFAF		74DS35DFAF		74DS350FAF		74DS35EFAF			
315	—	—	250	300	—	3RW4075-6BB35	74ES35BFAF		74ES35DFAF		74ES350FAF		74ES35EFAF			
385	—	—	300	400	—	3RW4076-6BB35	74FS35BFAF		74FS35DFAF		74FS350FAF		74FS35EFAF			

Enclosed Fusible Combination (Starter with Fusible Disconnect)

Rated Operating Current	MAX HP ^①				KW 380V	Class 20 Severe Duty (350% * I _e for 20s) ^②										
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel	List Price \$
112	30	40	75	—	56	3RW4055-6BB34	74AS3_BFAF		74AS3_DFAF		74AS3_0FAF		74AS3_EFAF		74AS3_WFAF	
132	40	50	100	—	75	3RW4056-6BB34	74BS3_BFAF		74BS3_DFAF		74BS3_0FAF		74BS3_EFAF		74BS3_WFAF	
185	60	60	125	—	93	3RW4073-6BB34	74CS3_BFAF		74CS3_DFAF		74CS3_0FAF		74CS3_EFAF			
205	60	75	150	—	112	3RW4074-6BB34	74DS3_BFAF		74DS3_DFAF		74DS3_0FAF		74DS3_EFAF			
280	75	100	200	—	149	3RW4075-6BB34	74ES3_BFAF		74ES3_DFAF		74ES3_0FAF		74ES3_EFAF			
340	100	125	250	—	186	3RW4076-6BB34	74FS3_BFAF		74FS3_DFAF		74FS3_0FAF		74FS3_EFAF			
						200V	6		6		6		6		6	
						230V	2		2		2		2		2	
						380V	3		3		3		3		3	
						460V	4		4		4		4		4	
112	—	—	75	75	—	3RW4055-6BB35	74AS35BFAF		74AS35DFAF		74AS350FAF		74AS35EFAF		74AS35WFAF	
132	—	—	100	125	—	3RW4056-6BB35	74BS35BFAF		74BS35DFAF		74BS350FAF		74BS35EFAF		74BS35WFAF	
185	—	—	125	150	—	3RW4073-6BB35	74CS35BFAF		74CS35DFAF		74CS350FAF		74CS35EFAF			
205	—	—	150	200	—	3RW4074-6BB35	74DS35BFAF		74DS35DFAF		74DS350FAF		74DS35EFAF			
280	—	—	200	250	—	3RW4075-6BB35	74ES35BFAF		74ES35DFAF		74ES350FAF		74ES35EFAF			
340	—	—	250	300	—	3RW4076-6BB35	74FS35BFAF		74FS35DFAF		74FS350FAF		74FS35EFAF			

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Control circuit transformer
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, etc.

Class 73 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Im for 10s) ^②									
	200V	230V	460V	575V	380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	73AT3_BFA		73AT3_DFA		73AT3_OFA		73AT3_EFA		73AT3_WFA
32	10	10	20	—	15	3RW4423-1BC34	73BT3_BFA		73BT3_DFA		73BT3_OFA		73BT3_EFA		73BT3_WFA
42	10	15	25	—	19	3RW4424-1BC34	73CT3_BFA		73CT3_DFA		73CT3_OFA		73CT3_EFA		73CT3_WFA
51	15	15	30	—	22	3RW4425-1BC34	73DT3_BFA		73DT3_DFA		73DT3_OFA		73DT3_EFA		73DT3_WFA
68	20	25	50	—	37	3RW4426-1BC34	73ET3_BFA		73ET3_DFA		73ET3_OFA		73ET3_EFA		73ET3_WFA
82	25	30	60	—	45	3RW4427-1BC34	73FT3_BFA		73FT3_DFA		73FT3_OFA		73FT3_EFA		73FT3_WFA
100	30	30	75	—	56	3RW4434-6BC34	73GT3_BFA		73GT3_DFA		73GT3_OFA		73GT3_EFA		73GT3_WFA
117	30	40	75	—	56	3RW4435-6BC34	73HT3_BFA		73HT3_DFA		73HT3_OFA		73HT3_EFA		73HT3_WFA
145	40	50	100	—	75	3RW4436-6BC34	73JT3_BFA		73JT3_DFA		73JT3_OFA		73JT3_EFA		73JT3_WFA
180	60	60	125	—	93	3RW4443-6BC34	73KT3_BFA		73KT3_DFA		73KT3_OFA		73KT3_EFA		73KT3_WFA
215	60	75	150	—	112	3RW4444-6BC34	73LT3_BFA		73LT3_DFA		73LT3_OFA		73LT3_EFA		73LT3_WFA
280	75	100	200	—	149	3RW4445-6BC34	73MT3_BFA		73MT3_DFA		73MT3_OFA		73MT3_EFA		73MT3_WFA
315	100	125	250	—	186	3RW4446-6BC34	73NT3_BFA		73NT3_DFA		73NT3_OFA		73NT3_EFA		73NT3_WFA
385	125	150	300	—	224	3RW4447-6BC34	73PT3_BFA		73PT3_DFA		73PT3_OFA		73PT3_EFA		73PT3_WFA
494	150	200	400	—	298	3RW4453-6BC34	73QT3_BFA		73QT3_DFA		73QT3_OFA		73QT3_EFA		73QT3_WFA
551	150	200	450	—	336	3RW4454-6BC34	73RT3_BFA		73RT3_DFA		73RT3_OFA		73RT3_EFA		73RT3_WFA
615	200	250	500	—	373	3RW4455-6BC34	73ST3_BFA		73ST3_DFA		73ST3_OFA		73ST3_EFA		73ST3_WFA
693	200	250	550	—	410	3RW4456-6BC34	73TT3_BFA		73TT3_DFA		73TT3_OFA		73TT3_EFA		73TT3_WFA
780	200	250	600	—	447	3RW4457-6BC34	73WT3_BFA		73WT3_DFA		73WT3_OFA		73WT3_EFA		73WT3_WFA
970	350	350	800	—	597	3RW4465-6BC34	73YT3_BFA		73YT3_DFA		73YT3_OFA		73YT3_EFA		73YT3_WFA
1076	350	400	900	—	972	3RW4466-6BC34	73ZT3_BFA		73ZT3_DFA		73ZT3_OFA		73ZT3_EFA		73ZT3_WFA
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
26	—	—	15	20	—	3RW4422-1BC35	73AT35BFA		73AT35DFA		73AT35OFA		73AT35EFA		73AT35WFA
32	—	—	20	25	—	3RW4423-1BC35	73BT35BFA		73BT35DFA		73BT35OFA		73BT35EFA		73BT35WFA
42	—	—	25	30	—	3RW4424-1BC35	73CT35BFA		73CT35DFA		73CT35OFA		73CT35EFA		73CT35WFA
51	—	—	30	40	—	3RW4425-1BC35	73DT35BFA		73DT35DFA		73DT35OFA		73DT35EFA		73DT35WFA
68	—	—	50	50	—	3RW4426-1BC35	73ET35BFA		73ET35DFA		73ET35OFA		73ET35EFA		73ET35WFA
82	—	—	60	75	—	3RW4427-1BC35	73FT35BFA		73FT35DFA		73FT35OFA		73FT35EFA		73FT35WFA
100	—	—	75	75	—	3RW4434-6BC35	73GT35BFA		73GT35DFA		73GT35OFA		73GT35EFA		73GT35WFA
117	—	—	75	100	—	3RW4435-6BC35	73HT35BFA		73HT35DFA		73HT35OFA		73HT35EFA		73HT35WFA
145	—	—	100	125	—	3RW4436-6BC35	73JT35BFA		73JT35DFA		73JT35OFA		73JT35EFA		73JT35WFA
180	—	—	125	150	—	3RW4443-6BC35	73KT35BFA		73KT35DFA		73KT35OFA		73KT35EFA		73KT35WFA
215	—	—	150	200	—	3RW4444-6BC35	73LT35BFA		73LT35DFA		73LT35OFA		73LT35EFA		73LT35WFA
280	—	—	200	250	—	3RW4445-6BC35	73MT35BFA		73MT35DFA		73MT35OFA		73MT35EFA		73MT35WFA
315	—	—	250	300	—	3RW4446-6BC35	73NT35BFA		73NT35DFA		73NT35OFA		73NT35EFA		73NT35WFA
385	—	—	300	400	—	3RW4447-6BC35	73PT35BFA		73PT35DFA		73PT35OFA		73PT35EFA		73PT35WFA
494	—	—	400	500	—	3RW4453-6BC35	73QT35BFA		73QT35DFA		73QT35OFA		73QT35EFA		73QT35WFA
551	—	—	450	600	—	3RW4454-6BC35	73RT35BFA		73RT35DFA		73RT35OFA		73RT35EFA		73RT35WFA
615	—	—	500	700	—	3RW4455-6BC35	73ST35BFA		73ST35DFA		73ST35OFA		73ST35EFA		73ST35WFA
693	—	—	550	750	—	3RW4456-6BC35	73TT35BFA		73TT35DFA		73TT35OFA		73TT35EFA		73TT35WFA
780	—	—	600	850	—	3RW4457-6BC35	73WT35BFA		73WT35DFA		73WT35OFA		73WT35EFA		73WT35WFA
970	—	—	800	1000	—	3RW4465-6BC35	73YT35BFA		73YT35DFA		73YT35OFA		73YT35EFA		73YT35WFA
1076	—	—	900	1100	—	3RW4466-6BC35	73ZT35BFA		73ZT35DFA		73ZT35OFA		73ZT35EFA		73ZT35WFA

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.

Enclosed 3RW44



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 10, 15, or 20
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.

Class 73 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Control circuit transformer
- Line side power terminal block
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 73 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

Enclosed Non-Combination (Starter Only)

Rated Operating Current	MAX HP ^①				KW	Class 20 Severe Duty (350% * Im for 20s) ^②									
	200V	230V	460V	575V	380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	73AT3_BFA		73AT3_DFA		73AT3_OFA		73AT3_EFA		73AT3_WFA
32	10	10	20	—	15	3RW4423-1BC34	73BT3_BFA		73BT3_DFA		73BT3_OFA		73BT3_EFA		73BT3_WFA
42	10	15	25	—	19	3RW4424-1BC34	73CT3_BFA		73CT3_DFA		73CT3_OFA		73CT3_EFA		73CT3_WFA
51	15	15	30	—	22	3RW4425-1BC34	73DT3_BFA		73DT3_DFA		73DT3_OFA		73DT3_EFA		73DT3_WFA
68	20	25	50	—	37	3RW4426-1BC34	73ET3_BFA		73ET3_DFA		73ET3_OFA		73ET3_EFA		73ET3_WFA
82	25	30	60	—	45	3RW4427-1BC34	73FT3_BFA		73FT3_DFA		73FT3_OFA		73FT3_EFA		73FT3_WFA
97	30	30	60	—	45	3RW4434-6BC34	73GT3_BFA		73GT3_DFA		73GT3_OFA		73GT3_EFA		73GT3_WFA
113	30	40	75	—	56	3RW4435-6BC34	73HT3_BFA		73HT3_DFA		73HT3_OFA		73HT3_EFA		73HT3_WFA
134	40	50	75	—	56	3RW4436-6BC34	73JT3_BFA		73JT3_DFA		73JT3_OFA		73JT3_EFA		73JT3_WFA
175	50	60	100	—	75	3RW4443-6BC34	73KT3_BFA		73KT3_DFA		73KT3_OFA		73KT3_EFA		73KT3_WFA
195	60	75	125	—	93	3RW4444-6BC34	73LT3_BFA		73LT3_DFA		73LT3_OFA		73LT3_EFA		73LT3_WFA
243	75	75	150	—	112	3RW4445-6BC34	73MT3_BFA		73MT3_DFA		73MT3_OFA		73MT3_EFA		73MT3_WFA
263	75	100	200	—	149	3RW4446-6BC34	73NT3_BFA		73NT3_DFA		73NT3_OFA		73NT3_EFA		73NT3_WFA
326	100	125	250	—	186	3RW4447-6BC34	73PT3_BFA		73PT3_DFA		73PT3_OFA		73PT3_EFA		73PT3_WFA
494	150	150	400	—	224	3RW4453-6BC34	73QT3_BFA		73QT3_DFA		73QT3_OFA		73QT3_EFA		73QT3_WFA
551	150	200	450	—	298	3RW4454-6BC34	73RT3_BFA		73RT3_DFA		73RT3_OFA		73RT3_EFA		73RT3_WFA
615	200	200	500	—	336	3RW4455-6BC34	73ST3_BFA		73ST3_DFA		73ST3_OFA		73ST3_EFA		73ST3_WFA
634	200	250	500	—	373	3RW4456-6BC34	73TT3_BFA		73TT3_DFA		73TT3_OFA		73TT3_EFA		73TT3_WFA
650	200	250	550	—	410	3RW4457-6BC34	73WT3_BFA		73WT3_DFA		73WT3_OFA		73WT3_EFA		73WT3_WFA
880	300	350	700	—	522	3RW4465-6BC34	73YT3_BFA		73YT3_DFA		73YT3_OFA		73YT3_EFA		73YT3_WFA
940	300	350	750	—	559	3RW4466-6BC34	73ZT3_BFA		73ZT3_DFA		73ZT3_OFA		73ZT3_EFA		73ZT3_WFA
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
26	—	—	15	20	—	3RW4422-1BC35	73AT35BFA		73AT35DFA		73AT35OFA		73AT35EFA		73AT35WFA
32	—	—	20	25	—	3RW4423-1BC35	73BT35BFA		73BT35DFA		73BT35OFA		73BT35EFA		73BT35WFA
42	—	—	25	30	—	3RW4424-1BC35	73CT35BFA		73CT35DFA		73CT35OFA		73CT35EFA		73CT35WFA
51	—	—	30	40	—	3RW4425-1BC35	73DT35BFA		73DT35DFA		73DT35OFA		73DT35EFA		73DT35WFA
68	—	—	50	50	—	3RW4426-1BC35	73ET35BFA		73ET35DFA		73ET35OFA		73ET35EFA		73ET35WFA
82	—	—	60	75	—	3RW4427-1BC35	73FT35BFA		73FT35DFA		73FT35OFA		73FT35EFA		73FT35WFA
97	—	—	60	75	—	3RW4434-6BC35	73GT35BFA		73GT35DFA		73GT35OFA		73GT35EFA		73GT35WFA
113	—	—	75	100	—	3RW4435-6BC35	73HT35BFA		73HT35DFA		73HT35OFA		73HT35EFA		73HT35WFA
134	—	—	75	125	—	3RW4436-6BC35	73JT35BFA		73JT35DFA		73JT35OFA		73JT35EFA		73JT35WFA
175	—	—	100	150	—	3RW4443-6BC35	73KT35BFA		73KT35DFA		73KT35OFA		73KT35EFA		73KT35WFA
195	—	—	125	200	—	3RW4444-6BC35	73LT35BFA		73LT35DFA		73LT35OFA		73LT35EFA		73LT35WFA
243	—	—	150	200	—	3RW4445-6BC35	73MT35BFA		73MT35DFA		73MT35OFA		73MT35EFA		73MT35WFA
263	—	—	200	250	—	3RW4446-6BC35	73NT35BFA		73NT35DFA		73NT35OFA		73NT35EFA		73NT35WFA
326	—	—	250	300	—	3RW4447-6BC35	73PT35BFA		73PT35DFA		73PT35OFA		73PT35EFA		73PT35WFA
494	—	—	400	500	—	3RW4453-6BC35	73QT35BFA		73QT35DFA		73QT35OFA		73QT35EFA		73QT35WFA
551	—	—	450	550	—	3RW4454-6BC35	73RT35BFA		73RT35DFA		73RT35OFA		73RT35EFA		73RT35WFA
615	—	—	500	600	—	3RW4455-6BC35	73ST35BFA		73ST35DFA		73ST35OFA		73ST35EFA		73ST35WFA
693	—	—	500	650	—	3RW4456-6BC35	73TT35BFA		73TT35DFA		73TT35OFA		73TT35EFA		73TT35WFA
780	—	—	550	700	—	3RW4457-6BC35	73WT35BFA		73WT35DFA		73WT35OFA		73WT35EFA		73WT35WFA
880	—	—	700	850	—	3RW4465-6BC35	73YT35BFA		73YT35DFA		73YT35OFA		73YT35EFA		73YT35WFA
940	—	—	750	900	—	3RW4466-6BC35	73ZT35BFA		73ZT35DFA		73ZT35OFA		73ZT35EFA		73ZT35WFA

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.
- For stocked versions see page 7/89.

Class 74 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Circuit breaker with disconnect
- Control circuit transformer
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 74 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

Enclosed Combination with Circuit Breaker Disconnect

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty (350% * Im for 10s) ^②									
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAP		74AT3_DFAP		74AT3_OFAP		74AT3_EFAP		74AT3_WFAP
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAP		74BT3_DFAP		74BT3_OFAP		74BT3_EFAP		74BT3_WFAP
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAP		74CT3_DFAP		74CT3_OFAP		74CT3_EFAP		74CT3_WFAP
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAP		74DT3_DFAP		74DT3_OFAP		74DT3_EFAP		74DT3_WFAP
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAP		74ET3_DFAP		74ET3_OFAP		74ET3_EFAP		74ET3_WFAP
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAP		74FT3_DFAP		74FT3_OFAP		74FT3_EFAP		74FT3_WFAP
100	30	30	75	—	56	3RW4434-6BC34	74GT3_BFAP		74GT3_DFAP		74GT3_OFAP		74GT3_EFAP		74GT3_WFAP
117	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAP		74HT3_DFAP		74HT3_OFAP		74HT3_EFAP		74HT3_WFAP
145	40	50	100	—	75	3RW4436-6BC34	74JT3_BFAP		74JT3_DFAP		74JT3_OFAP		74JT3_EFAP		74JT3_WFAP
180	60	60	125	—	93	3RW4443-6BC34	74KT3_BFAP		74KT3_DFAP		74KT3_OFAP		74KT3_EFAP		74KT3_WFAP
215	60	75	150	—	112	3RW4444-6BC34	74LT3_BFAP		74LT3_DFAP		74LT3_OFAP		74LT3_EFAP		74LT3_WFAP
280	75	100	200	—	149	3RW4445-6BC34	74MT3_BFAP		74MT3_DFAP		74MT3_OFAP		74MT3_EFAP		74MT3_WFAP
315	100	125	250	—	186	3RW4446-6BC34	74NT3_BFAP		74NT3_DFAP		74NT3_OFAP		74NT3_EFAP		74NT3_WFAP
385	125	150	300	—	224	3RW4447-6BC34	74PT3_BFAP		74PT3_DFAP		74PT3_OFAP		74PT3_EFAP		74PT3_WFAP
494	150	200	400	—	298	3RW4453-6BC34	74QT3_BFAT		74QT3_DFAT		74QT3_OFAT		74QT3_EFAT		74QT3_WFAT
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAT		74RT3_DFAT		74RT3_OFAT		74RT3_EFAT		74RT3_WFAT
615	200	250	500	—	373	3RW4455-6BC34	74ST3_BFAT		74ST3_DFAT		74ST3_OFAT		74ST3_EFAT		74ST3_WFAT
693	200	250	550	—	410	3RW4456-6BC34	74TT3_BFAT		74TT3_DFAT		74TT3_OFAT		74TT3_EFAT		74TT3_WFAT
780	200	250	600	—	447	3RW4457-6BC34	74WT3_BFAT		74WT3_DFAT		74WT3_OFAT		74WT3_EFAT		74WT3_WFAT
970	350	350	800	—	597	3RW4465-6BC34	74YT3_BFAT		74YT3_DFAT		74YT3_OFAT		74YT3_EFAT		74YT3_WFAT
1076	350	400	900	—	672	3RW4466-6BC34	74ZT3_BFAT		74ZT3_DFAT		74ZT3_OFAT		74ZT3_EFAT		74ZT3_WFAT
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAP		74AT35DFAP		74AT35OFAP		74AT35EFAP		74AT35WFAP
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAP		74BT35DFAP		74BT35OFAP		74BT35EFAP		74BT35WFAP
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAP		74CT35DFAP		74CT35OFAP		74CT35EFAP		74CT35WFAP
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAP		74DT35DFAP		74DT35OFAP		74DT35EFAP		74DT35WFAP
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAP		74ET35DFAP		74ET35OFAP		74ET35EFAP		74ET35WFAP
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAP		74FT35DFAP		74FT35OFAP		74FT35EFAP		74FT35WFAP
100	—	—	75	75	—	3RW4434-6BC35	74GT35BFAP		74GT35DFAP		74GT35OFAP		74GT35EFAP		74GT35WFAP
117	—	—	75	100	—	3RW4435-6BC35	74HT35BFAP		74HT35DFAP		74HT35OFAP		74HT35EFAP		74HT35WFAP
145	—	—	100	125	—	3RW4436-6BC35	74JT35BFAP		74JT35DFAP		74JT35OFAP		74JT35EFAP		74JT35WFAP
180	—	—	125	150	—	3RW4443-6BC35	74KT35BFAP		74KT35DFAP		74KT35OFAP		74KT35EFAP		74KT35WFAP
215	—	—	150	200	—	3RW4444-6BC35	74LT35BFAP		74LT35DFAP		74LT35OFAP		74LT35EFAP		74LT35WFAP
280	—	—	200	250	—	3RW4445-6BC35	74MT35BFAP		74MT35DFAP		74MT35OFAP		74MT35EFAP		74MT35WFAP
315	—	—	250	300	—	3RW4446-6BC35	74NT35BFAP		74NT35DFAP		74NT35OFAP		74NT35EFAP		74NT35WFAP
385	—	—	300	400	—	3RW4447-6BC35	74PT35BFAP		74PT35DFAP		74PT35OFAP		74PT35EFAP		74PT35WFAP
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAT		74QT35DFAT		74QT35OFAT		74QT35EFAT		74QT35WFAT
551	—	—	450	600	—	3RW4454-6BC35	74RT35BFAT		74RT35DFAT		74RT35OFAT		74RT35EFAT		74RT35WFAT
615	—	—	500	700	—	3RW4455-6BC35	74ST35BFAT		74ST35DFAT		74ST35OFAT		74ST35EFAT		74ST35WFAT
693	—	—	550	750	—	3RW4456-6BC35	74TT35BFAT		74TT35DFAT		74TT35OFAT		74TT35EFAT		74TT35WFAT
780	—	—	600	850	—	3RW4457-6BC35	74WT35BFAT		74WT35DFAT		74WT35OFAT		74WT35EFAT		74WT35WFAT
970	—	—	800	1000	—	3RW4465-6BC35	74YT35BFAT		74YT35DFAT		74YT35OFAT		74YT35EFAT		74YT35WFAT
1076	—	—	900	1100	—	3RW4466-6BC35	74ZT35BFAT		74ZT35DFAT		74ZT35OFAT		74ZT35EFAT		74ZT35WFAT

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.

Enclosed 3RW44



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
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Class 74 non-combination starters include:

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- 3RW44 Sirius softstarter with built-in OL and bypass
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- Control circuit transformer
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

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- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 74 starters are built to UL and CSA standards.

3RW44 For High Feature Applications

Enclosed Combination with Circuit Breaker Disconnect

Rated Operating Current	MAX HP ^①				KW	Class 20 Severe Duty (350% * Im for 20s) ^②									
	200V	230V	460V	575V	380V	OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAP		74AT3_DFAP		74AT3_OFAP		74AT3_EFAP		74AT3_WFAP
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAP		74BT3_DFAP		74BT3_OFAP		74BT3_EFAP		74BT3_WFAP
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAP		74CT3_DFAP		74CT3_OFAP		74CT3_EFAP		74CT3_WFAP
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAP		74DT3_DFAP		74DT3_OFAP		74DT3_EFAP		74DT3_WFAP
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAP		74ET3_DFAP		74ET3_OFAP		74ET3_EFAP		74ET3_WFAP
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAP		74FT3_DFAP		74FT3_OFAP		74FT3_EFAP		74FT3_WFAP
97	30	30	60	—	45	3RW4434-6BC34	74GT3_BFAP		74GT3_DFAP		74GT3_OFAP		74GT3_EFAP		74GT3_WFAP
113	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAP		74HT3_DFAP		74HT3_OFAP		74HT3_EFAP		74HT3_WFAP
134	40	50	75	—	56	3RW4436-6BC34	74JT3_BFAP		74JT3_DFAP		74JT3_OFAP		74JT3_EFAP		74JT3_WFAP
175	50	60	100	—	75	3RW4443-6BC34	74KT3_BFAP		74KT3_DFAP		74KT3_OFAP		74KT3_EFAP		74KT3_WFAP
195	60	75	125	—	93	3RW4444-6BC34	74LT3_BFAP		74LT3_DFAP		74LT3_OFAP		74LT3_EFAP		74LT3_WFAP
243	75	75	150	—	112	3RW4445-6BC34	74MT3_BFAP		74MT3_DFAP		74MT3_OFAP		74MT3_EFAP		74MT3_WFAP
263	75	100	200	—	149	3RW4446-6BC34	74NT3_BFAP		74NT3_DFAP		74NT3_OFAP		74NT3_EFAP		74NT3_WFAP
326	100	125	250	—	186	3RW4447-6BC34	74PT3_BFAP		74PT3_DFAP		74PT3_OFAP		74PT3_EFAP		74PT3_WFAP
494	150	150	400	—	224	3RW4453-6BC34	74QT3_BFAT		74QT3_DFAT		74QT3_OFAT		74QT3_EFAT		74QT3_WFAT
551	150	200	450	—	298	3RW4454-6BC34	74RT3_BFAT		74RT3_DFAT		74RT3_OFAT		74RT3_EFAT		74RT3_WFAT
615	200	200	500	—	336	3RW4455-6BC34	74ST3_BFAT		74ST3_DFAT		74ST3_OFAT		74ST3_EFAT		74ST3_WFAT
634	200	250	500	—	373	3RW4456-6BC34	74TT3_BFAT		74TT3_DFAT		74TT3_OFAT		74TT3_EFAT		74TT3_WFAT
650	200	250	550	—	410	3RW4457-6BC34	74WT3_BFAT		74WT3_DFAT		74WT3_OFAT		74WT3_EFAT		74WT3_WFAT
880	300	350	700	—	522	3RW4465-6BC34	74YT3_BFAT		74YT3_DFAT		74YT3_OFAT		74YT3_EFAT		74YT3_WFAT
940	300	350	750	—	559	3RW4466-6BC34	74ZT3_BFAT		74ZT3_DFAT		74ZT3_OFAT		74ZT3_EFAT		74ZT3_WFAT
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAP		74AT35DFAP		74AT35OFAP		74AT35EFAP		74AT35WFAP
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAP		74BT35DFAP		74BT35OFAP		74BT35EFAP		74BT35WFAP
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAP		74CT35DFAP		74CT35OFAP		74CT35EFAP		74CT35WFAP
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAP		74DT35DFAP		74DT35OFAP		74DT35EFAP		74DT35WFAP
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAP		74ET35DFAP		74ET35OFAP		74ET35EFAP		74ET35WFAP
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAP		74FT35DFAP		74FT35OFAP		74FT35EFAP		74FT35WFAP
97	—	—	60	75	—	3RW4434-6BC35	74GT35BFAP		74GT35DFAP		74GT35OFAP		74GT35EFAP		74GT35WFAP
113	—	—	75	100	—	3RW4435-6BC35	74HT35BFAP		74HT35DFAP		74HT35OFAP		74HT35EFAP		74HT35WFAP
134	—	—	75	125	—	3RW4436-6BC35	74JT35BFAP		74JT35DFAP		74JT35OFAP		74JT35EFAP		74JT35WFAP
175	—	—	100	150	—	3RW4443-6BC35	74KT35BFAP		74KT35DFAP		74KT35OFAP		74KT35EFAP		74KT35WFAP
195	—	—	125	200	—	3RW4444-6BC35	74LT35BFAP		74LT35DFAP		74LT35OFAP		74LT35EFAP		74LT35WFAP
243	—	—	150	200	—	3RW4445-6BC35	74MT35BFAP		74MT35DFAP		74MT35OFAP		74MT35EFAP		74MT35WFAP
263	—	—	200	250	—	3RW4446-6BC35	74NT35BFAP		74NT35DFAP		74NT35OFAP		74NT35EFAP		74NT35WFAP
326	—	—	250	300	—	3RW4447-6BC35	74PT35BFAP		74PT35DFAP		74PT35OFAP		74PT35EFAP		74PT35WFAP
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAT		74QT35DFAT		74QT35OFAT		74QT35EFAT		74QT35WFAT
551	—	—	450	550	—	3RW4454-6BC35	74RT35BFAT		74RT35DFAT		74RT35OFAT		74RT35EFAT		74RT35WFAT
615	—	—	500	600	—	3RW4455-6BC35	74ST35BFAT		74ST35DFAT		74ST35OFAT		74ST35EFAT		74ST35WFAT
693	—	—	500	650	—	3RW4456-6BC35	74TT35BFAT		74TT35DFAT		74TT35OFAT		74TT35EFAT		74TT35WFAT
780	—	—	550	700	—	3RW4457-6BC35	74WT35BFAT		74WT35DFAT		74WT35OFAT		74WT35EFAT		74WT35WFAT
880	—	—	700	850	—	3RW4465-6BC35	74YT35BFAT		74YT35DFAT		74YT35OFAT		74YT35EFAT		74YT35WFAT
940	—	—	750	900	—	3RW4466-6BC35	74ZT35BFAT		74ZT35DFAT		74ZT35OFAT		74ZT35EFAT		74ZT35WFAT

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor.

HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
- Fault monitoring
- 3 parameter sets
- Communication capable via opt. Profibus module
- Programmable inputs and outputs
- External keypad available

Ordering Information

- Enclosed devices should be ordered by the FLA of the motor.
- The 3RW44 is designed for normal starting applications.
- For factory modifications see page 7/43.
- For complete derating and application info see page 7/70.
- For dimensional drawings see page 7/95.

Class 74 non-combination starters include:

- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
- Fusible disconnect
- Control circuit transformer
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

- Fans
- Pumps
- Conveying systems and lifts
- Hydraulics
- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 74 starters are built to UL and CSA standards.

For all technical information, please consult the 2006 Industrial Controls Catalog or contact your local sales support center.

3RW44 For High Feature Applications

Enclosed Combination with Fusible Disconnect

Rated Operating Current	MAX HP ^①				KW	Class 10 Light Duty ^② (350% * Im for 10s)									
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAF		74AT3_DFAF		74AT3_OFAF		74AT3_EFAF		74AT3_WFAF
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAF		74BT3_DFAF		74BT3_OFAF		74BT3_EFAF		74BT3_WFAF
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAF		74CT3_DFAF		74CT3_OFAF		74CT3_EFAF		74CT3_WFAF
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAF		74DT3_DFAF		74DT3_OFAF		74DT3_EFAF		74DT3_WFAF
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAF		74ET3_DFAF		74ET3_OFAF		74ET3_EFAF		74ET3_WFAF
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAF		74FT3_DFAF		74FT3_OFAF		74FT3_EFAF		74FT3_WFAF
100	30	30	75	—	56	3RW4434-6BC34	74GT3_BFAF		74GT3_DFAF		74GT3_OFAF		74GT3_EFAF		74GT3_WFAF
117	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAF		74HT3_DFAF		74HT3_OFAF		74HT3_EFAF		74HT3_WFAF
145	40	50	100	—	75	3RW4436-6BC34	74JT3_BFAF		74JT3_DFAF		74JT3_OFAF		74JT3_EFAF		74JT3_WFAF
180	60	60	125	—	93	3RW4443-6BC34	74KT3_BFAF		74KT3_DFAF		74KT3_OFAF		74KT3_EFAF		74KT3_WFAF
215	60	75	150	—	112	3RW4444-6BC34	74LT3_BFAF		74LT3_DFAF		74LT3_OFAF		74LT3_EFAF		74LT3_WFAF
280	75	100	200	—	149	3RW4445-6BC34	74MT3_BFAF		74MT3_DFAF		74MT3_OFAF		74MT3_EFAF		74MT3_WFAF
315	100	125	250	—	186	3RW4446-6BC34	74NT3_BFAF		74NT3_DFAF		74NT3_OFAF		74NT3_EFAF		74NT3_WFAF
385	125	150	300	—	224	3RW4447-6BC34	74PT3_BFAF		74PT3_DFAF		74PT3_OFAF		74PT3_EFAF		74PT3_WFAF
494	150	200	400	—	298	3RW4453-6BC34	74QT3_BFAF				74QT3_OFAF				
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAF				74RT3_OFAF				
615	200	250	500	—	373	3RW4455-6BC34	74ST3_BFAF				74ST3_OFAF				
693	200	250	550	—		3RW4456-6BC34	74TT3_BFAF				74TT3_OFAF				
780	200	250	600	—	447	3RW4457-6BC34	74WT3_BFAF				74WT3_OFAF				
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAF		74AT35DFAF		74AT35OFAF		74AT35EFAF		74AT35WFAF
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAF		74BT35DFAF		74BT35OFAF		74BT35EFAF		74BT35WFAF
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAF		74CT35DFAF		74CT35OFAF		74CT35EFAF		74CT35WFAF
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAF		74DT35DFAF		74DT35OFAF		74DT35EFAF		74DT35WFAF
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAF		74ET35DFAF		74ET35OFAF		74ET35EFAF		74ET35WFAF
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAF		74FT35DFAF		74FT35OFAF		74FT35EFAF		74FT35WFAF
100	—	—	75	75	—	3RW4434-6BC35	74GT35BFAF		74GT35DFAF		74GT35OFAF		74GT35EFAF		74GT35WFAF
117	—	—	75	100	—	3RW4435-6BC35	74HT35BFAF		74HT35DFAF		74HT35OFAF		74HT35EFAF		74HT35WFAF
145	—	—	100	125	—	3RW4436-6BC35	74JT35BFAF		74JT35DFAF		74JT35OFAF		74JT35EFAF		74JT35WFAF
180	—	—	125	150	—	3RW4443-6BC35	74KT35BFAF		74KT35DFAF		74KT35OFAF		74KT35EFAF		74KT35WFAF
215	—	—	150	200	—	3RW4444-6BC35	74LT35BFAF		74LT35DFAF		74LT35OFAF		74LT35EFAF		74LT35WFAF
280	—	—	200	250	—	3RW4445-6BC35	74MT35BFAF		74MT35DFAF		74MT35OFAF		74MT35EFAF		74MT35WFAF
315	—	—	250	300	—	3RW4446-6BC35	74NT35BFAF		74NT35DFAF		74NT35OFAF		74NT35EFAF		74NT35WFAF
385	—	—	300	400	—	3RW4447-6BC35	74PT35BFAF		74PT35DFAF		74PT35OFAF		74PT35EFAF		74PT35WFAF
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAF				74QT35OFAF				
551	—	—	450	600	—	3RW4454-6BC35	74RT35BFAF				74RT35OFAF				
615	—	—	500	700	—	3RW4455-6BC35	74ST35BFAF				74ST35OFAF				
693	—	—	550	750	—	3RW4456-6BC35	74TT35BFAF				74TT35OFAF				
780	—	—	600	850	—	3RW4457-6BC35	74WT35BFAF				74WT35OFAF				

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② Starter selection is dependent on type of application. Im = FLA rating of motor.

Enclosed 3RW44



3RW44 Enclosed features:

- Available in NEMA 1, 12, 3R, 4, and 4 stainless steel
- Compact size
- Built-in bypass contactor
- Multiple starting/stopping techniques including torque control
- Internal overload class 5, 10, 15, 20, or 30
- Built-in graphical LCD keypad
- Internal self protection
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- 3 parameter sets
- Communication capable via opt. Profibus module
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- NEMA rated enclosure
- 3RW44 Sirius softstarter with built-in OL and bypass
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- Control circuit transformer
- Reset button

Ideal applications for 3RW44 enclosed softstarters:

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- Machine tools
- Mills saws
- Crushers and grinders
- Mixers
- HVAC systems

The 3RW44 severe duty rating table should be applied for high inertia applications such rock crushers, chippers, screw compressors, ect.

Class 74 starters are built to UL and CSA standards.

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3RW44 For High Feature Applications

Enclosed Combination with Fusible Disconnect

Rated Operating Current	MAX HP ^①				KW	Class 20 Severe Duty (350% * Im for 20s) ^②									
	200V	230V	460V	575V		OPEN Style (Starter Only)	NEMA 1	List Price \$	NEMA 3R	List Price \$	NEMA 12	List Price \$	NEMA 4	List Price \$	NEMA 4/4X Stainless Steel
26	7.5	7.5	15	—	12	3RW4422-1BC34	74AT3_BFAF		74AT3_DFAF		74AT3_OFAF		74AT3_EFAF		74AT3_WFAF
32	10	10	20	—	15	3RW4423-1BC34	74BT3_BFAF		74BT3_DFAF		74BT3_OFAF		74BT3_EFAF		74BT3_WFAF
42	10	15	25	—	19	3RW4424-1BC34	74CT3_BFAF		74CT3_DFAF		74CT3_OFAF		74CT3_EFAF		74CT3_WFAF
51	15	15	30	—	22	3RW4425-1BC34	74DT3_BFAF		74DT3_DFAF		74DT3_OFAF		74DT3_EFAF		74DT3_WFAF
68	20	25	50	—	37	3RW4426-1BC34	74ET3_BFAF		74ET3_DFAF		74ET3_OFAF		74ET3_EFAF		74ET3_WFAF
82	25	30	60	—	45	3RW4427-1BC34	74FT3_BFAF		74FT3_DFAF		74FT3_OFAF		74FT3_EFAF		74FT3_WFAF
97	30	30	60	—	45	3RW4434-6BC34	74GT3_BFAF		74GT3_DFAF		74GT3_OFAF		74GT3_EFAF		74GT3_WFAF
113	30	40	75	—	56	3RW4435-6BC34	74HT3_BFAF		74HT3_DFAF		74HT3_OFAF		74HT3_EFAF		74HT3_WFAF
134	40	50	75	—	56	3RW4436-6BC34	74JT3_BFAF		74JT3_DFAF		74JT3_OFAF		74JT3_EFAF		74JT3_WFAF
175	50	60	100	—	75	3RW4443-6BC34	74KT3_BFAF		74KT3_DFAF		74KT3_OFAF		74KT3_EFAF		74KT3_WFAF
195	60	75	125	—	93	3RW4444-6BC34	74LT3_BFAF		74LT3_DFAF		74LT3_OFAF		74LT3_EFAF		74LT3_WFAF
243	75	75	150	—	112	3RW4445-6BC34	74MT3_BFAF		74MT3_DFAF		74MT3_OFAF		74MT3_EFAF		74MT3_WFAF
263	75	100	200	—	149	3RW4446-6BC34	74NT3_BFAF		74NT3_DFAF		74NT3_OFAF		74NT3_EFAF		74NT3_WFAF
326	100	125	250	—	186	3RW4447-6BC34	74PT3_BFAF		74PT3_DFAF		74PT3_OFAF		74PT3_EFAF		74PT3_WFAF
494	150	150	400	—	298	3RW4453-6BC34	74QT3_BFAF				74QT3_OFAF				
551	150	200	450	—	336	3RW4454-6BC34	74RT3_BFAF				74RT3_OFAF				
615	200	200	500	—	373	3RW4455-6BC34	74ST3_BFAF				74ST3_OFAF				
634	200	250	500	—	373	3RW4456-6BC34	74TT3_BFAF				74TT3_OFAF				
650	200	250	550	—	373	3RW4457-6BC34	74WT3_BFAF				74WT3_OFAF				
						200V	6		6		6		6		6
						230V	2		2		2		2		2
						380V	3		3		3		3		3
						460V	4		4		4		4		4
26	—	—	15	20	—	3RW4422-1BC35	74AT35BFAF		74AT35DFAF		74AT35OFAF		74AT35EFAF		74AT35WFAF
32	—	—	20	25	—	3RW4423-1BC35	74BT35BFAF		74BT35DFAF		74BT35OFAF		74BT35EFAF		74BT35WFAF
42	—	—	25	30	—	3RW4424-1BC35	74CT35BFAF		74CT35DFAF		74CT35OFAF		74CT35EFAF		74CT35WFAF
51	—	—	30	40	—	3RW4425-1BC35	74DT35BFAF		74DT35DFAF		74DT35OFAF		74DT35EFAF		74DT35WFAF
68	—	—	50	50	—	3RW4426-1BC35	74ET35BFAF		74ET35DFAF		74ET35OFAF		74ET35EFAF		74ET35WFAF
82	—	—	60	75	—	3RW4427-1BC35	74FT35BFAF		74FT35DFAF		74FT35OFAF		74FT35EFAF		74FT35WFAF
97	—	—	60	75	—	3RW4434-6BC35	74GT35BFAF		74GT35DFAF		74GT35OFAF		74GT35EFAF		74GT35WFAF
113	—	—	75	100	—	3RW4435-6BC35	74HT35BFAF		74HT35DFAF		74HT35OFAF		74HT35EFAF		74HT35WFAF
134	—	—	75	125	—	3RW4436-6BC35	74JT35BFAF		74JT35DFAF		74JT35OFAF		74JT35EFAF		74JT35WFAF
175	—	—	100	150	—	3RW4443-6BC35	74KT35BFAF		74KT35DFAF		74KT35OFAF		74KT35EFAF		74KT35WFAF
195	—	—	125	200	—	3RW4444-6BC35	74LT35BFAF		74LT35DFAF		74LT35OFAF		74LT35EFAF		74LT35WFAF
243	—	—	150	200	—	3RW4445-6BC35	74MT35BFAF		74MT35DFAF		74MT35OFAF		74MT35EFAF		74MT35WFAF
263	—	—	200	250	—	3RW4446-6BC35	74NT35BFAF		74NT35DFAF		74NT35OFAF		74NT35EFAF		74NT35WFAF
326	—	—	250	300	—	3RW4447-6BC35	74PT35BFAF		74PT35DFAF		74PT35OFAF		74PT35EFAF		74PT35WFAF
494	—	—	400	500	—	3RW4453-6BC35	74QT35BFAF				74QT35OFAF				
551	—	—	450	550	—	3RW4454-6BC35	74RT35BFAF				74RT35OFAF				
615	—	—	500	600	—	3RW4455-6BC35	74ST35BFAF				74ST35OFAF				
693	—	—	550	650	—	3RW4456-6BC35	74TT35BFAF				74TT35OFAF				
780	—	—	600	700	—	3RW4457-6BC35	74WT35BFAF				74WT35OFAF				

① Starter size is dependent on the nameplate Full Load Amps (FLA) rating of the motor. HPs are for reference only. Enclosed ratings are at 40°C.

② Starter selection is dependent on type of application. Im = FLA rating of motor.

Factory Modifications

Modification Available modifications in STANDARD enclosure	3RW Version	Enclosed Style	Enclosure NEMA Type	Mod Suffix	List Price Adder \$
Push Buttons					
Start/Stop	3RW40/44	73/74	ALL	A1	
Emergency Stop	3RW40/44	73/74	ALL	ES	
Selector Switches					
Hand-Off-Auto	3RW40/44	73/74	ALL	A3	
Hand-Off-Auto w/ start pushbutton	3RW40/44	73/74	ALL	S3	
Off-On	3RW40/44	73/74	ALL	A4	
Pilot Light					
Red 'On'	3RW40/44	73/74	ALL	FA	
Green 'On'	3RW40/44	73/74	ALL	FB	
Red 'Run'	3RW40/44	73/74	ALL	FC	
Green 'Run'	3RW40/44	73/74	ALL	FD	
Red 'Off'	3RW40/44	73/74	ALL	FJ	
Green 'Off'	3RW40/44	73/74	ALL	FK	
Amber 'Fault'	3RW40/44	73/74	ALL	FL	
White 'Control Power On'	3RW40/44	73/74	ALL	FW	
Red, 'On' Push-to-Test	3RW40/44	73/74	ALL	FS	
Green 'On' Push-to-Test	3RW40/44	73/74	ALL	FT	
Green 'Off' Push-to-Test	3RW40/44	73/74	ALL	FU	
Custom pilot light (state color and nameplate text)	3RW40/44	73/74	ALL	FZ	
Through the Door Metering					
External keypad for 3RW44	3RW44	73/74	1,12	K1	
Elapse time meter	3RW40/44	73/74	1,12 (120V)	M5	
Control Options					
Profibus Communication Module (installed-connection cable not supplied)	3RW44	73/74	ALL	P1	
Profinet Communication Module (installed-connection cable not supplied)	3RW44	73/74	ALL	P2	
Ground Lug - 1 Conductor	3RW40/44	73/74	ALL	L10	
Alarm Package (horn, light, relay & push button)	3RW40/44	73/74	1,3R,12	M7	
Electronic 8 function timing relay (.05s - 100h) 24V/100-127V supplied mounted and unwired	3RW40/44	73/74	ALL	TR	
Control Relay supplied mounted and unwired (4 pole max)	3RW40/44	73/74	ALL	R04 R22 R40	
Circuit Breaker Shunt Trip (included std in 3RW40 versions)	3RW44	74	ALL	L6	
Function identification plate w/ marking as specified	3RW40/44	73/74	ALL	N1	
Service Entrance Labeled	3RW40/44	74	ALL	N3	
Terminal Block 3 point	3RW40/44	73/74	ALL	TC3	
Terminal Block 6 point	3RW40/44	73/74	ALL	TC6	
Terminal Block 9 point	3RW40/44	73/74	ALL	TC9	
Terminal Block 12 point	3RW40/44	73/74	ALL	TC12	

Emergency HP Rated Bypass Starter	3RW Version	Class	Enclosure NEMA Type	Mod Suffix	Amp Rating (3rd character of catalog number)									
					List price Adder \$									
	3RW40 new	73/74	1/12/3R/4	A12	A,B	C,D,E	FGH	J	—	—	—	—	—	—
	3RW40 ②	73/74	1/12/3R/4	A12	—	—	A	B,C	D	E,F	—	—	—	—
	3RW44	73	1/12/3R/4	A12	A,B,C ④	D,E ④	F,G,H	J,K,L	M	N,P	Q	R,S,T,W	Y,Z ④	
	3RW44	74	1/12/3R/4	A12	A,B,C	D,E	F,G,H	J,K,L	M	N,P	Q	R,S,T,W	Y,Z ④	

Available Modifications Requiring the MODIFIED OPTIONS Box Size (to be used with the selections ending in GA*)	3RW Version	Class	Enclosure NEMA Type	Mod Suffix	Amp Rating (3rd character of catalog number)									
					List price Adder \$									
Isolation Contactor ③	3RW40				—	—	A	B,C	D	E,F	—	—	—	—
100 VA Extra CPT Capacity	3RW44				A,B,C	D,E	F,G,H	J,K,L	M	N,P	Q	R,S,T,W	Y,Z ④	
Space Heater (120V separate control)	3RW40/44	73/74	1/12/3R/4	IC										
Space Heater w/ T-stat (120V separate control)	3RW40/44	73/74	ALL	CA										
Space Heater (120V separate control)	3RW40/44	73/74	ALL	SH										
Space Heater w/ T-stat (120V separate control)	3RW40/44	73/74	ALL	ST										
Lightning Arrestor	3RW40/44	73/74	ALL	L										

① (A) For sizes 73YT & 73ZT, mods IC & A12 are available and can have both either individually or both at the same time; (B) For sizes 74YT & 74ZT (combination w/ICB), mods IC & A12 are only available individually (NOT both at the same time); (C) For sizes 74YT & 74ZT (combination w/ fusible disc), mods IC & A12 are NOT available individually or both.

② An isolation contactor is included for 3RW40 version with bypass.
③ An isolation contactor is standard on all 3RW40 new styles
④ Includes mod box price, change 8th character to G.

3RW Soft Starters

3RW30 for standard applications

Overview

The SIRIUS 3RW30 soft starters reduce the motor voltage through variable phase control and increase it in ramp-like mode from a selectable starting voltage up to mains voltage. During starting, these devices limit the torque as well as the current and prevent the shocks which arise during direct starts or wye-delta starts. In this way, mechanical loads and mains voltage dips can be reliably reduced.

Soft starting reduces the stress on the connected equipment and results in lower wear and therefore longer periods of trouble-free production. The selectable start value means that the soft starters can be adjusted individually to the requirements of the application in question and unlike wye-delta starters are not restricted to two-stage starting with fixed voltage ratios.

The SIRIUS 3RW30 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that no power loss has to be taken into the bargain at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

Various versions of the SIRIUS 3RW30 soft starters are available:

- Standard version for fixed-speed three-phase motors, sizes S00, S0, S2 and S3, with integrated bypass contact system
- Version for fixed-speed three-phase motors in a 22.5 mm enclosure without bypass

Soft starters rated up to 75Hp (at 460 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple commissioning are just three of the many advantages of this soft starter.

Function

The space required by the compact SIRIUS 3RW30 soft starter is often only about one third of that required by a contactor assembly for wye-delta starting of comparable rating. This not only saves space in the control cabinet and on the standard mounting rail but also does away completely with the wiring work needed for wye-delta starters. This is notable in particular for higher motor ratings which are only rarely available as fully wired solutions.

At the same time the number of cables from the starter to the motor is reduced from six to three. Compact dimensions, short start-up times, easy wiring and fast commissioning make themselves felt as clear-cut cost advantages.

The bypass contacts of these soft starters are protected during operation by an integrated solid-state arc quenching system. This prevents damage to the bypass contacts in the event of a fault, e. g. brief disconnection of the control voltage, mechanical shocks or life-related component defects on the coil operating mechanism or main contact spring.

The new series of devices comes with the "polarity balancing" control method, which is designed to prevent direct current components in two-phase controlled soft starters. On two-phase controlled soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. This results for physical reasons in an asymmetric distribution of the three phase currents during the motor ramp-up. This phenomenon cannot be influenced, but in most applications it is non-critical.

Controlling the power semiconductors results not only in this unbalance, however, but also in the previously mentioned direct current components which can cause severe noise generation on the motor at starting voltages of less than 50 %. The control method used for these soft starters eliminates these direct current components during the ramp-up phase and prevents the braking torque which they can cause.

It creates a motor ramp-up that is uniform in speed, torque and current rise, thus permitting a particularly gentle, two-phase starting of the motors. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled soft starter. This is made possible by the ongoing dynamic harmonizing and balancing of current half-waves of different polarity during the motor ramp-up. Hence the name "polarity balancing".

- Soft starting with voltage ramp; the starting voltage setting range U_s is 40 % to 100 % and the ramp time t_R can be set from 0 s to 20 s
- Integrated bypass contact system to minimize power loss
- Setting with two potentiometers
- Simple mounting and commissioning
- Mains voltages at 50/60 Hz, 200 to 480 V
- Two control voltage versions 24 V AC/DC and 110 to 230 V AC/DC
- Wide temperature range from -25 °C to +60 °C
- The built-in auxiliary contact ensures user-friendly control and possible further processing within the system ([for status graphs see page 7/54](#))

Technical specifications

Type				3RW30 1., 3RW30 2.		3RW30 3., 3RW30 4.		
Control electronics								
Rated values		Terminal A1/A2						
Rated control supply voltage		V		24	110 ... 230	24	110 ... 230	
• Tolerance		%		±20	-15/+10	±20	-15/+10	
Rated control supply current								
• STANDBY		mA		< 50	6	20	< 50	
• During pick-up		mA		< 100	15	< 4000	< 500	
• ON		mA		< 100	15	20	< 50	
Rated frequency		Hz		50/60				
• Tolerance		%		±10				
Control input								
IN				ON/OFF				
Power consumption with version								
• 24 V DC		mA		Approx. 12				
• 110/230 V AC		mA		AC: 3/6; DC: 1.5/3				
Relay outputs								
Output 1	ON	13/14		Operating indication (NO)				
Rated operational current			A	3 AC-15/AC-14 at 230 V, 1 DC-13 at 24 V				
			A					
Protection against overvoltages				Protection by means of varistor through contact				
Short-circuit protection				4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)				
Operating indications				LEDs	DEVICE	STATE/BYPASSED/ FAILURE	DEVICE	STATE/BYPASSED/ FAILURE
Off				Green	Off	Green	Off	
Start				Green	Green flashing	Green	Green flashing	
Bypass				Green	Green	Green	Green	
Error signals								
• 24 V DC:		$U < 0.75 \times U_s$ or $U > 1.25 \times U_s$		Off	Red	Off	Red	
• 110 ... 230 V AC:		$U < 0.75 \times U_s$ or $U > 1.15 \times U_s$		Off	Red	Off	Red	
Electrical overloading of bypass (reset by removing IN command)				Yellow	Red	--	--	
Missing mains voltage, phase failure, missing load				Green	Red	Green	Red	
Device fault				Red	Red	Red	Red	

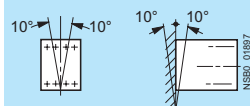
Type	3RW30 1. ... 3RW30 4.		
			Factory default
Control times and parameters			
Control times			
Closing time (with connected control voltage)	ms	< 50	
Closing time (automatic/mains contactor mode)	ms	< 300	
Mains failure bridging time			
Control supply voltage	ms	50	
Mains failure response time¹⁾			
Load circuit	ms	500	
Starting parameters			
• Starting time	s	0 ... 20	7.5
• Starting voltage	%	40 ... 100	40
Start-up detection		No	
Operating mode output 13/14			
Rising edge at	Start command	ON	
Falling edge at	Off command		

¹⁾ Mains failure detection only in standby state, not during operation.

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Type	3RW30 1.-.BB.4 ... 3RW30 4.-.BB.4	
Power electronics		
Rated operational voltage	V AC	200 ... 480
Tolerance	%	-15/+10
Rated frequency	Hz	50/60
Tolerance	%	±10
Uninterrupted duty at 40 °C (% of I_e)	%	115
Minimum load (% of I_e)	%	10 (at least 2 A)
Maximum cable length between soft starter and motor	m	300
Permissible installation height	m	5000 (derating from 1000, see characteristic curves); higher on request
Permissible mounting position (auxiliary fan not available)		
Permissible ambient temperature	°C	-25 ... +60; (derating from +40)
Operation	°C	-40 ... +80
Storage		
Degree of protection	IP20 for 3RW30 1. and 3RW30 2.; IP00 for 3RW30 3. and 3RW30 4.	

Type		3RW30 13	3RW30 14	3RW30 16	3RW30 17	3RW30 18
Power electronics						
40 °C/50 °C/60 °C						
Load rating with rated operational current I_e						
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	3.6/ 3.3 /3	6.5/ 6 /5.5	9/ 8 /7	12.5/ 12 /11	17.6/ 17 /14
Power loss						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	0.25	0.5	1	2	4
• During starting with 300 % I_M (40 °C)	W	6	13	20	20	29
Permissible rated motor current and starts per hour for normal starting (Class 10)						
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	3.6/ 3.3 /3	6.5/ 6 /5.5	9/ 8 /7	12.5/ 12 /11	17.6/ 17 /14
- Starts per hour ³⁾	1/h	200/ 150 /70	87/ 60 /50	50	85/ 70 /60	62/ 46 /60
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	3.6/ 3.3 /3	6.5/ 6 /5.5	9/ 8 /7	12.5/ 12 /11	17.6/ 17 /14
- Starts per hour ³⁾	1/h	150/ 100 /50	64/ 46 /28	35	62/ 47 /37	45/ 32 /43

¹⁾ Measurement at 60 °C according to UL/CSA not required.

²⁾ With 300 % I_M .

³⁾ For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Type		3RW30 26	3RW30 27	3RW30 28
Power electronics				
40 °C/50 °C/60 °C				
Load rating with rated operational current I_e				
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	25.3/ 23 /21	32.2/ 29 /26	38/ 34 /31
Power loss				
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	8	13	19
• During starting with 300 % I_M (40 °C)	W	47	55	64
Permissible rated motor current and starts per hour for normal starting (Class 10)				
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	25/ 23 /21	32/ 29 /26	38/ 34 /31
- Starts per hour ³⁾	1/h	23	23	19
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	25/ 23 /21	32/ 29 /26	38/ 34 /31
- Starts per hour ³⁾	1/h	15	16	12

¹⁾ Measurement at 60 °C according to UL/CSA not required.

²⁾ With 300 % I_M .

³⁾ For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

Type		3RW30 36	3RW30 37	3RW30 38	3RW30 46	3RW30 47
Power electronics		40 °C/50 °C/60 °C				
Load rating with rated operational current I_e						
<ul style="list-style-type: none"> Acc. to IEC and UL/CSA¹⁾, for individual mounting at 40/50/60 °C, AC-53a 	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
Power loss						
<ul style="list-style-type: none"> In operation after completed starting with uninterrupted rated operational current (40 °C) approx. 	W	6	12	15	12	21
<ul style="list-style-type: none"> During starting with 300 % I_M (40 °C) 	W	79	111	125	144	192
Permissible rated motor current and starts per hour for normal starting (Class 10)						
<ul style="list-style-type: none"> - Rated motor current $I_M^{(2)}$, starting time 10 s - Starts per hour³⁾ 	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
	1/h	38	23	22	22	15
<ul style="list-style-type: none"> - Rated motor current $I_M^{(2)}$, starting time 20 s - Starts per hour³⁾ 	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
	1/h	26	15	15	15	10

¹⁾ Measurement at 60 °C according to UL/CSA not required.




²⁾ With 300 % I_M .

³⁾ For intermittent duty S4 with ON period = 30 %, T_u = 40 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

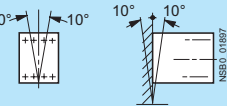
For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Soft starters	Type		3RW30 1.	3RW30 2.	3RW30 3.	3RW30 4.
Conductor cross-sections						
Screw terminals	Main conductors					
 NSB00479	• Solid	mm ²	2 x (1 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947	2 x (1 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947; max. 1 x 10	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• Finely stranded with end sleeve	mm ²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6)	2 x (1 ... 2.5); 2 x (2.5 ... 6)	1 x (0.75 ... 25)	1 x (2.5 ... 35)
	• Stranded	mm ²	--	--	1 x (0.75 ... 35)	1 x (4 ... 70)
	• AWG cables - Solid - Solid or stranded - Stranded	AWG AWG AWG	2 x (16 ... 12) 2 x (14 ... 10) 1 x 8	2 x (16 ... 12) 2 x (14 ... 10) 1 x 8	1 x (18 ... 2) --	1 x (10 ... 2/0) --
Rear clamping point connected	• Solid	mm ²	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
 NSB00480	• Finely stranded with end sleeve	mm ²	--	--	1 x (1.5 ... 25)	1 x (2.5 ... 50)
	• Stranded	mm ²	--	--	1 x (1.5 ... 35)	1 x (10 ... 70)
	• AWG cables - Solid or stranded	AWG	--	--	1 x (16 ... 2)	1 x (10 ... 2/0)
	• Solid	mm ²	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
Both clamping points connected	• Stranded	mm ²	--	--	2 x (1.5 ... 25)	2 x (10 ... 50)
 NSB00481	• Finely stranded with end sleeve	mm ²	--	--	2 x (1.5 ... 16)	2 x (2.5 ... 35)
	• AWG cables - Solid or stranded	AWG	--	--	2 x (16 ... 2)	2 x (10 ... 1/0)
	• Tightening torque	NM lb.in	2 ... 2.5 18 ... 22	2 ... 2.5 18 ... 22	4.5 40	6.5 58
	Tools		PZ 2	PZ 2	PZ 2	Allen screw 4 mm
	Degree of protection		IP20	IP20	IP20 (IP00 terminal compartment)	IP20 (IP00 terminal compartment)
Spring-type terminals	Main conductors					
	• Solid	mm ²	1 ... 4	1 ... 10	--	--
	• Finely stranded with end sleeve	mm ²	1 ... 2.5	1 ... 6, end sleeves without plastic collar	--	--
	• AWG cables - Solid or stranded (finely stranded) - Stranded	AWG AWG	16 ... 14 16 ... 12	16 ... 10 1 x 8	-- --	-- --
	Tools		DIN ISO 2380-1A0; 5 x 3	DIN ISO 2380-1A0; 5 x 3	--	--
	Degree of protection		IP20	IP20	--	--
Busbar connections	Main conductors					
	• With cable lug acc. to DIN 46234 or max. 20 mm wide					
	- Stranded	mm ²	--	--	--	2 x (10 ... 70)
	- Finely stranded	mm ²	--	--	--	2 x (10 ... 50)
	• AWG cables, solid or stranded	AWG	--	--	--	2 x (7 ... 1/0)

Soft starters	Type		3RW30 1. ... 3RW30 4.
Conductor cross-sections			
Auxiliary conductors (1 or 2 conductors can be connected):			
	Screw terminals		
	• Solid	mm ²	2 x (0.5 ... 2.5)
	• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5)
	• AWG cables - Solid or stranded - Finely stranded with end sleeve	AWG AWG	2 x (20 ... 14) 2 x (20 ... 16)
	• Terminal screws - Tightening torque	NM lb.in	0.8 ... 1.2 7 ... 10.3
	Spring-type terminals		
	• Solid	mm ²	2 x (0.25 ... 2.5)
	• Finely stranded with end sleeve	mm ²	2 x (0.25 ... 1.5)
	• AWG cables, solid or stranded	AWG	2 x (24 ... 14)

Type		3RW30 03
Control electronics		
Rated values		
Rated control supply voltage	V	24 ... 230 AC/DC
• Tolerance	%	± 10
Rated control supply current	mA	25 ... 4
Rated frequency at AC	Hz	50/60
• Tolerance	%	± 10
Starting time	s	0.1 ... 20 (adjustable)
Starting voltage	%	40 ... 100 (adjustable)
Ramp-down time	s	0 ... 20 (adjustable)
Power electronics		
Rated operational voltage	V AC	200 ... 400
Tolerance	%	± 10
Rated frequency	Hz	50/60
Tolerance	%	± 10
Uninterrupted duty (% of I_e)	%	100
Minimum load¹⁾ (% of I_e); at 40 °C	%	9
Maximum conductor length between soft starter and motor	m	100 ²⁾
Degree of protection acc. to IEC 60529		IP20 (IP00 terminal compartment)
Permissible installation height	m	5000 (derating from 1000, see characteristic curves); higher on request
Permissible mounting position		
Permissible ambient temperature		
Operation	°C	-25 ... +60; (derating from +40)
Storage	°C	-40 ... +80
Load rating with rated operational current I_e		
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting, AC-53a		
- At 40 °C	A	3
- At 50 °C	A	2.6
- At 60 °C	A	2.2
• Acc. to IEC and UL/CSA ¹⁾ , for butt-mounting, AC-53a		
- At 40 °C	A	2.6
- At 50 °C	A	2.2
- At 60 °C	A	1.8
Power loss		
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6.5
• At utilization of max. switching frequency	W	3
Permissible starts per hour		
• For intermittent duty S4, $T_u = 40$ °C, stand-alone installation vertical	1/h	1500
• ON period = 70 %	% I_e /s	300/0.2
Conductor cross-sections		
Screw terminals (1 or 2 conductors connectable) For standard screwdriver size 2 and Pozidriv 2		
• Main conductors		
- Solid	mm ²	1 x (0.5 ... 4); 2 x (0.5 ... 2.5)
- Finely stranded with end sleeve	mm ²	1 x (0.5 ... 2.5); 2 x (0.5 ... 1.5)
- Stranded	mm ²	—
- AWG cables, solid or stranded	AWG	2 x (20 ... 14)
- Terminal screws		M3, PZ2
- Tightening torque	NM lb.in	0.8 ... 1.2 7.1 ... 8.9
• Auxiliary conductors		
- Solid	mm ²	1 x (0.5 ... 4); 2 x (0.5 ... 2.5)
- Finely stranded with end sleeve	mm ²	1 x (0.5 ... 2.5); 2 x (0.5 ... 1.5)
- AWG cables, solid or stranded	AWG	2 x (20 ... 14)
- Terminal screws		M3, PZ2
- Tightening torque	NM lb.in	0.8 ... 1.2 7 ... 8.9
Spring-type terminals		
Main and auxiliary conductors		
• Solid	mm ²	2 x (0.25 ... 1.5)
• Finely stranded with end sleeve	mm ²	2 x (0.25 ... 1)
• AWG cables, solid or stranded	mm ²	2 x (24 ... 16)

¹⁾ The rated motor current (specified on the motor's name plate) should at least amount to the specified percentage of the SIRIUS soft starter unit's rated operational current I_e .

²⁾ If this value is exceeded, problems with line capacities may arise, which can result in false firing.

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

	Standard	Parameters
Electromagnetic compatibility Acc. to EN 60947-4-2		
EMC interference immunity		
Electrostatic discharge (ESD)	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Frequency range: 80 ... 2000 MHz with 80 % at 1 kHz Degree of severity 3: 10 V/m
Conducted RF interference	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V
RF voltages and RF currents on cables • Burst • Surge	EN 61000-4-4	±2 kV/5 kHz
	EN 61000-4-5	±1 kV line to line ±2 kV line to earth
EMC interference emission		
EMC interference field strength	EN 55011	Limit value of Class A at 30 ... 1000 MHz, limit value of Class B for 3RW30 2.; 24 V AC/DC
Radio interference voltage	EN 55011	Limit value of Class A at 0.15 ... 30 MHz, limit value of Class B for 3RW30 2.; 24 V AC/DC
Radio interference suppression filters		
Degree of noise suppression A (industrial applications)	Not required	
Degree of noise suppression B (applications for residential areas) Control voltage • 230 V AC/DC • 24 V AC/DC	Not available ¹⁾ Not required for 3RW30 1. and 3RW30 2.; required for 3RW30 3. and 3RW30 4. (see Table)	

¹⁾ Degree of noise suppression B cannot be obtained through the use of filters as the strength of the electromagnetic field is not attenuated by the filter.

Soft starter type	Rated current Soft starters A	Recommended filters ¹⁾		
		Voltage range 200 ... 480 V Filter type	Rated current filters A	Terminals mm ²
3RW30 36	45	4EF1512-1AA10	50	16
3RW30 37	63	4EF1512-2AA10	66	25
3RW30 38	72	4EF1512-3AA10	90	25
3RW30 46	80	4EF1512-3AA10	90	25
3RW30 47	106	4EF1512-4AA10	120	50

¹⁾ The radio interference suppression filter is used to remove the conducted interference from the main circuit. The field-related emissions comply with

degree of noise suppression B. Filter selection applies under standard conditions: 10 starts per hour, start time 4 s at 300 % I_G .

Type Number	Max. Fuse Class K5, RK5, RK1	Max. Fuse Class J	Short Voltage Circuit	Voltage
Standard short circuit ratings 3RW30				
3RW30 13	--	15 A	5 kA	480 V
3RW30 14	--	25 A	5 kA	480 V
3RW30 16	--	36 A	5 kA	480 V
3RW30 17	--	50 A	5 kA	480 V
3RW30 18	--	60 A	5 kA	480 V
3RW30 26	100 A	100 A	5 kA	480 V
3RW30 27	125 A	125 A	5 kA	480 V
3RW30 28	125 A	125 A	5 kA	480 V
3RW30 36	175 A	175 A	10 kA	480 V
3RW30 37	250 A	250 A	10 kA	480 V
3RW30 38	250 A	250 A	10 kA	480 V
3RW30 46	--	300 A	10 kA	480 V
3RW30 47	--	350 A	10 kA	480 V

High capacity short circuit ratings 3RW30

3RW30 13	--	15 A	42 kA	480 V
3RW30 14	--	25 A	42 kA	480 V
3RW30 16	--	25 A	42 kA	480 V
3RW30 17	--	25 A	42 kA	480 V
3RW30 18	--	25 A	42 kA	480 V
3RW30 26	60 A	100 A	42 kA	480 V
3RW30 27	60 A	125 A	42 kA	480 V
3RW30 28	60 A	125 A	42 kA	480 V
3RW30 36	100 A	175 A	30 kA	480 V
3RW30 37	100 A	200 A	30 kA	480 V
3RW30 38	100 A	200 A	30 kA	480 V
3RW30 46	110 A	200 A	42 kA	480 V
3RW30 47	110 A	200 A	42 kA	480 V

For solid-state motor controller, Type 3RW301: Applicable in an enclosure with minimum overall dimensions of 200 by 120 by 200 mm.

For solid-state motor controller, Type 3RW302: Applicable in an enclosure with minimum overall dimensions of 370 by 175 by 195 mm.

For solid-state motor controller, Type 3RW303: Applicable in an enclosure with minimum overall dimensions of 450 by 220 by 235 mm.

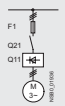
For solid-state motor controller, Type 3RW304: Applicable in an enclosure with minimum overall dimensions of 450 by 220 by 235 mm.

Fuse assignment

The type of coordination to which the motor feeder with soft starter is mounted depends on the application-specific requirements. Normally, fuseless mounting (combination of motor starter protector/circuit breaker and soft starter) is sufficient.

If type of coordination "2" is to be fulfilled, semiconductor fuses must be fitted in the motor feeder.

Fused version (line protection only)

Fused version (line protection only)					
					
Soft starters	Rated current	Line protection, maximum	Rated current	Size	Line contactors (optional)
Q11 Type	A	F1 Type	A		Q21
Type of coordination "1" ¹⁾ : $I_q = 65 \text{ kA at } 480 \text{ V } 10 \%$					
3RW30 03 ²⁾	3	3NA3 805 ³⁾	20	000	3RT10 15
3RW30 13	3.6	3NA3 803-6	10	000	3RT10 15
3RW30 14	6.5	3NA3 805-6	16	000	3RT10 15
3RW30 16	9	3NA3 807-6	20	000	3RT10 16
3RW30 17	12.5	3NA3 810-6	25	000	3RT10 24
3RW30 18	17.6	3NA3 814-6	35	000	3RT10 26
3RW30 26	25	3NA3 822-6	63	00	3RT10 26
3RW30 27	32	3NA3 824-6	80	00	3RT10 34
3RW30 28	38	3NA3 824-6	80	00	3RT10 35
3RW30 36	45	3NA3 130-6	100	1	3RT10 36
3RW30 37	63	3NA3 132-6	125	1	3RT10 44
3RW30 38	72	3NA3 132-6	125	1	3RT10 45
3RW30 46	80	3NA3 136-6	160	1	3RT10 45
3RW30 47	106	3NA3 136-6	160	1	3RT10 46

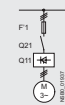
¹⁾ The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".

The type of coordination "1" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

²⁾ $I_q = 50 \text{ kA at } 400 \text{ V}$.

³⁾ 3NA3 805-1 (LV HRC00), 5SB2 61 (DIAZED), 5SE2 201-6 (NEOZED)

Fused version with 3NE1 SITOR fuses (semiconductor and line protection)

					
For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" —> "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" —> "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor —> "Products" —> "BETA Protecting" —> "SITOR"					
Soft starters	Rated current	All-range fuses	Rated current	Size	Line contactors (optional)
Q11 Type	A	F1 Type	A		Q21
Type of coordination "2" ¹⁾ : $I_q = 65 \text{ kA at } 480 \text{ V } 10 \%$					
3RW30 03 ²⁾	3	3NE1 813-0 ³⁾	16	000	3RT10 15
3RW30 13	3.6	3NE1 813-0	16	000	3RT10 15
3RW30 14	6.5	3NE1 813-0	16	000	3RT10 15
3RW30 16	9	3NE1 813-0	16	000	3RT10 16
3RW30 17	12.5	3NE1 813-0	16	000	3RT10 24
3RW30 18	17.6	3NE1 814-0	20	000	3RT10 26
3RW30 26	25	3NE1 803-0	35	000	3RT10 26
3RW30 27	32	3NE1 020-2	80	00	3RT10 34
3RW30 28	38	3NE1 020-2	80	00	3RT10 35
3RW30 36	45	3NE1 020-2	80	00	3RT10 36
3RW30 37	63	3NE1 820-0	80	000	3RT10 44
3RW30 38	72	3NE1 820-0	80	000	3RT10 45
3RW30 46	80	3NE1 021-0	100	00	3RT10 45
3RW30 47	106	3NE1 022-0	125	00	3RT10 46

¹⁾ The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".

The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

²⁾ $I_q = 50 \text{ kA at } 400 \text{ V}$.

³⁾ No SITOR fuse required!
Alternatively: 3NA3 803 (LV HRC00), 5SB2 21 (DIAZED), 5SE2 206 (NEOZED).

ToC 1

Type of coordination "1"

ToC 2

Type of coordination "2"

The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".

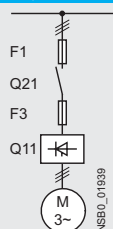
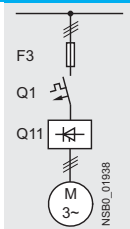
These types of coordination are indicated in the Technical specifications by gray backgrounds.

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Fused version with 3NE3 SITOR fuses (semiconductor protection by fuse, line and overload protection by motor starter protector; alternatively, installation with contactor and overload relay possible)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" → "Switch Disconnectors", and Catalog ET B 1 under "BETA Protecting" → "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor → "Products" → "BETA Protecting" → "SITOR"

Soft starters	Rated current	Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses, minimum		
		F3 Type	Rated current	Size	F3 Type	Rated current	Size	F3 Type	Rated current	Size
Q11 Type	A		A			A			A	
Type of coordination "2" ¹⁾ : $I_q = 65 \text{ kA at } 480 \text{ V } 10 \%$										
3RW30 03 ²⁾	3	--	--	--	--	--	--	3NE4 101	32	0
3RW30 13	3.6	--	--	--	--	--	--	3NE4 101	32	0
3RW30 14	6.5	--	--	--	--	--	--	3NE4 101	32	0
3RW30 16	9	--	--	--	--	--	--	3NE4 101	32	0
3RW30 17	12.5	--	--	--	--	--	--	3NE4 101	32	0
3RW30 18	17.6	--	--	--	3NE3 221	100	1	3NE4 101	32	0
3RW30 26	25	--	--	--	3NE3 221	100	1	3NE4 102	40	0
3RW30 27	32	--	--	--	3NE3 222	125	1	3NE4 118	63	0
3RW30 28	38	--	--	--	3NE3 222	125	1	3NE4 118	63	0
3RW30 36	45	--	--	--	3NE3 224	160	1	3NE4 120	80	0
3RW30 37	63	--	--	--	3NE3 225	200	1	3NE4 121	100	0
3RW30 38	72	3NE3 221	100	1	3NE3 227	250	1	--	--	--
3RW30 46	80	3NE3 222	125	1	3NE3 225	200	1	--	--	--
3RW30 47	106	3NE3 224	160	1	3NE3 231	350	1	--	--	--

Soft starters	Rated current	Semiconductor fuses max.			Semiconductor fuses min.			Semiconductor fuses max.			Cylindrical fuses	
		F3 Type	Rated current	Size	F3 Type	Rated current	Size	F3 Type	Rated current	Size	F3 Type	Rated current
Q11 Type	A		A			A			A			
Type of coordination "2" ¹⁾ : $I_q = 65 \text{ kA at } 480 \text{ V } 10 \%$												
3RW30 03 ²⁾	3	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC1 010	10
3RW30 13	3.6	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC2 220	20
3RW30 14	6.5	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC2 220	20
3RW30 16	9	--	--	--	3NE8 015-1	25	00	3NE8 015-1	25	00	3NC2 220	20
3RW30 17	12.5	--	--	--	3NE8 015-1	25	00	3NE8 018-1	63	00	3NC2 250	50
3RW30 18	17.6	--	--	--	3NE8 003-1	35	00	3NE8 021-1	100	00	3NC2 263	63
3RW30 26	25	3NE4 117	50	0	3NE8 017-1	50	00	3NE8 021-1	100	00	3NC2 263	63
3RW30 27	32	3NE4 118	63	0	3NE8 018-1	63	00	3NE8 022-1	125	00	3NC2 280	80
3RW30 28	38	3NE4 118	63	0	3NE8 020-1	80	00	3NE8 022-1	125	00	3NC2 280	80
3RW30 36	45	3NE4 120	80	0	3NE8 020-1	80	00	3NE8 024-1	160	00	3NC2 280	80
3RW30 37	63	3NE4 121	100	0	3NE8 021-1	100	00	3NE8 024-1	160	00	--	--
3RW30 38	72	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW30 46	80	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW30 47	106	--	--	--	3NE8 024-1	160	00	3NE8 024-1	160	00	--	--

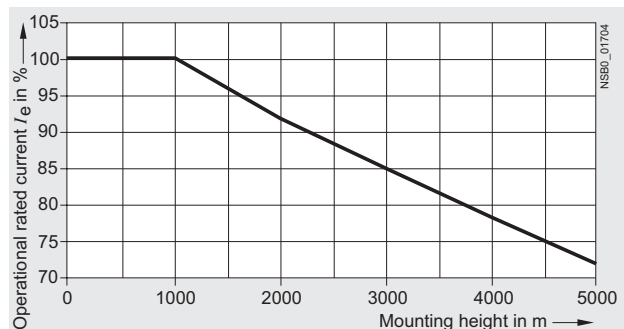
Soft starters	Rated current	Line contactors		Motor starter protectors		Line protection, maximum		
		(optional)	Q21 Type	400 V +10 %	Rated current	F1 Type	Rated current	Size
Q11 Type	A			Q1 Type	A		A	
Type of coordination "2" ¹⁾ : $I_q = 65 \text{ kA at } 480 \text{ V } 10 \%$								
3RW30 03 ²⁾	3	3RT10 15	3RV10 11-1EA10	4	3NA3 805 ³⁾	20	000	
3RW30 13	3.6	3RT10 15	3RV10 21-1FA10	5	3NA3 803-6	10	000	
3RW30 14	6.5	3RT10 15	3RV10 21-1HA10	8	3NA3 805-6	16	000	
3RW30 16	9	3RT10 16	3RV10 21-1JA10	10	3NA3 807-6	20	000	
3RW30 17	12.5	3RT10 24	3RV10 21-1KA10	12.5	3NA3 810-6	25	000	
3RW30 18	17.6	3RT10 26	3RV10 21-1BA10	20	3NA3 814-6	35	000	
3RW30 26	25	3RT10 26	3RV10 31-4DA10	25	3NA3 822-6	63	00	
3RW30 27	32	3RT10 34	3RV10 31-4EA10	32	3NA3 824-6	80	00	
3RW30 28	38	3RT10 35	3RV10 31-4FA10	40	3NA3 824-6	80	00	
3RW30 36	45	3RT10 36	3RV10 31-4GA10	45	3NA3 130-6	100	1	
3RW30 37	63	3RT10 44	3RV10 41-4JA10	63	3NA3 132-6	125	1	
3RW30 38	72	3RT10 45	3RV10 41-4KA10	75	3NA3 132-6	125	1	
3RW30 46	80	3RT10 45	3RV10 41-4LA10	90	3NA3 136-6	160	1	
3RW30 47	106	3RT10 46	3RV10 41-4MA10	100	3NA3 136-6	160	1	

¹⁾ The types of coordination are explained under "3RA1 Fuseless Load Feeders". The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit

breaker/fuse), not to any additional components in the feeder.

²⁾ $I_q = 50 \text{ kA at } 400 \text{ V}$.

³⁾ 3NA3 805-1 (LV HRC00), 5SB2 61 (DIAZED).

Characteristic curves**Permissible installation height**

At an installation height above 2000 m, the max. permissible operational voltage is reduced to 460 V.

More information**Application examples for normal starting (Class 10)**

Normal starting Class 10 (up to 20 s with 300 % $I_{n \text{ motor}}$).

The soft starter rating can be selected to be as high as the rating of the motor used

Application		Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
Starting parameters							
• Voltage ramp and current limiting							
- Starting voltage	%	70	60	50	40	40	40
- Starting time	s	10	10	20	20	10	10

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during commissioning.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

For Operation in the Control Cabinet

3RW Soft Starters

3RW30 for standard applications

Configuration

The 3RW solid-state motor controllers are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

If necessary, an overload relay for heavy starting must be selected where long starting times are involved. PTC sensors are recommended.

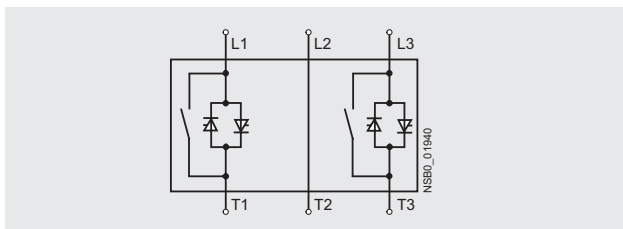
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses, controls and overload relays) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

Note:

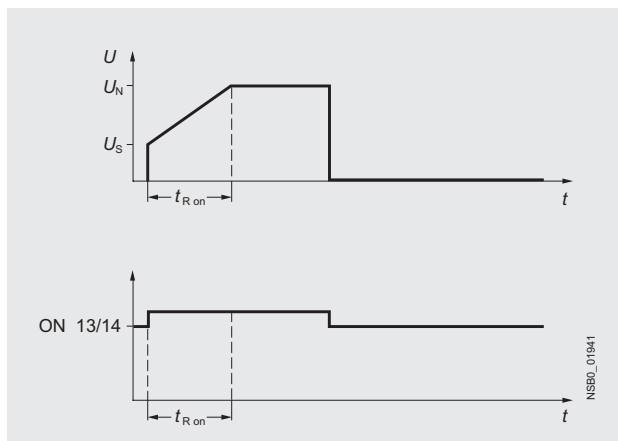
When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Schematic circuit diagram



A bypass contact system is already integrated in the 3RW30 soft starter and therefore does not have to be ordered separately.

Status graphs



Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

www.usa.siemens.com/softstarters > Software

More information can be found on the Internet at:

www.usa.siemens.com/softstarters

Overview

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30 soft starters.

The SIRIUS 3RW40 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that no power loss has to be taken into the bargain at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

At the same time this soft starter comes with additional integrated functions such as adjustable current limiting, motor overload and intrinsic device protection, and optional thermistor motor protection. The higher the motor rating, the more important these functions become because they make it unnecessary to purchase and install protection equipment such as overload relays.

Internal intrinsic device protection prevents the thermal overloading of the thyristors and the power section defects this can cause. As an option the thyristors can also be protected by semiconductor fuses from short-circuiting.

Thanks to integrated status monitoring and fault monitoring, this compact soft starter offers many different diagnostics options. Up to four LEDs and relay outputs permit differentiated monitoring and diagnostics of the operating mechanism by indicating the operating state as well as for example mains or phase failure, missing load, non-permissible tripping time/class setting, thermal overloading or device faults.

Soft starters rated up to 300 Hp (at 460 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple start-up are just three of the many advantages of the SIRIUS 3RW40 soft starters.

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RW40 soft starter sizes S0 to S12 are suitable for the starting of explosion-proof motors with "increased safety" type of protection EEx e.

See "Appendix" -> "Standards and approvals" -> "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)".

Function

The space required by the compact SIRIUS 3RW40 soft starter is often only about one third of that required by a contactor assembly for wye-delta starting of comparable rating. This not only saves space in the control cabinet and on the standard mounting rail but also does away completely with the wiring work needed for wye-delta starters. This is notable in particular for higher motor ratings which are only rarely available as fully wired solutions.

At the same time the number of cables from the starter to the motor is reduced from six to three. Compact dimensions, short start-up times, easy wiring and fast commissioning make themselves felt as clear-cut cost advantages.

The bypass contacts of these soft starters are protected during operation by an integrated solid-state arc quenching system. This prevents damage to the bypass contacts in the event of a fault, e. g. brief disconnection of the control voltage, mechanical shocks or life-related component defects on the coil operating mechanism or main contact spring.

The starting current of particularly powerful operating mechanisms can place an unjustifiable load on the local supply system. Soft starters reduce this starting current by means of their voltage ramp. Thanks to the adjustable current limiting, the SIRIUS 3RW40 soft starter takes even more pressure off the supply system. It leaves the set start ramp during the ramp-up – the ramp gradient is fixed by the starting voltage and the ramp time – as soon as the selected current limit is reached. From this moment the voltage of the soft starter is controlled so that the current supplied to the motor remains constant. This process is ended either by completion of the motor ramp-up or by tripping by the intrinsic device protection or the motor overload protection. As the result of this function the actual motor ramp-up can well take longer than the ramp time selected on the soft starter.

Thanks to the integrated motor overload protection according to IEC 60947-4-2 there is no need of an additional overload relay on the new soft starters. The rated motor current, the setting of the overload tripping time (Class times) and the reset of the motor overload protection function can be adjusted easily and quickly. Using a 4-step rotary potentiometer it is possible to set different overload tripping times on the soft starter. In addition to Class 10, 15 and 20 it is also possible to switch off the motor overload protection if a different motor management control device is to be used for this function, e. g. with connection to PROFIBUS.

Device versions with thermistor motor protection evaluation are available up to a rating of 55 kW (at 400 V). A "Thermoclick" measuring probe can be connected directly, as can a PTC of type A. Thermal overloading of the motor, open circuits and short-circuits in the sensor circuit all result in the direct disconnection of the soft starter. And if ever the soft starter trips, various reset options are available the same as with intrinsic device protection and motor load protection: manually with the reset button, automatically or remotely through brief disconnection of the control voltage.

The new series of devices comes with the "polarity balancing" control method, which is designed to prevent direct current components in two-phase controlled soft starters. On two-phase controlled soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. This results for physical reasons in an asymmetric distribution of the three phase currents during the motor ramp-up. This phenomenon cannot be influenced, but in most applications it is non-critical.

Controlling the power semiconductors results not only in this unbalance, however, but also in the previously mentioned direct current components which can cause severe noise generation on the motor at starting voltages of less than 50 %.

The control method used for these soft starters eliminates these direct current components during the ramp-up phase and prevents the braking torque which they can cause. It creates a motor ramp-up that is uniform in speed, torque and current rise, thus permitting a particularly gentle, two-phase starting of the motors. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled soft starter. This is made possible by the on-going dynamic harmonizing and balancing of current half-waves of different polarity during the motor ramp-up. Hence the name "polarity balancing".

For Operation in the Control Cabinet

3RW Soft Starters

3RW40

for standard applications

As an option the thyristors can also be protected by SITOR semiconductor fuses from short-circuiting so that the soft starter is still functional after a short-circuit (type of coordination 2). Three LEDs are used to indicate the operating state as well as possible errors, e. g. non-permissible tripping time (CLASS setting), mains or phase failure, missing load, thermal overloading or device faults.

- Soft starting with voltage ramp; the starting voltage setting range U_s is 40 to 100 % and the ramp time t_R can be set from 0 to 20 s.³⁾
- Smooth ramp-down with voltage ramp; the running down time t_{off} can be set between 0 s to 20 s.³⁾
- Solid-state motor overload and intrinsic device protection
- Optional thermistor motor protection (up to size S3)
- Remote reset (integrated up to size S3, optional for size S6 and larger)
- Adjustable current limiting

- Integrated bypass contact system to minimize power loss
- Setting with potentiometers
- Simple mounting and commissioning
- Integrated status monitoring and fault monitoring
- Mains voltages 50/60 Hz, 200 to 600 V
- Various control voltage versions
 - Sizes S0 to S3:
24 V AC/DC and 110 to 230 V AC/DC
 - Sizes S6 to S12:
115 V AC and 230 V AC.
 Control by way of the internal 24 V DC supply and direct control by means of PLC are possible.
- Wide temperature range from -25 to +60 °C
- Built-in auxiliary contacts ensure user-friendly control and possible further processing within the system ([for status graphs see page 7/69](#))

Technical specifications

Type			3RW40 2.		3RW40 3., 3RW40 4.	
Control electronics						
Rated values		Terminal A1/A2				
Rated control supply voltage		V	24	110 ... 230	24	110 ... 230
• Tolerance		%	±20	-15/+10	±20	-15/+10
Rated control supply current		mA	< 150	< 50	< 200	< 50
• STANDBY		mA	< 200	< 100	< 5000	< 1500
• During pick-up		mA	< 250	< 50	< 200	< 50
• ON without fan		mA	< 300	< 70	< 250	< 70
• ON with fan		mA				
Rated frequency		Hz	50/60			
• Tolerance		%	±10			
Control inputs						
IN			ON/OFF			
Rated operational current		mA	Approx. 12	3/6	Approx. 12	3/6
• AC		mA	Approx. 12	1.5/3	Approx. 12	1.5/3
• DC		mA				
Relay outputs						
Output 1	ON/RUN mode ¹⁾	13/14	Operating indication (NO) Bypass indication (NO) Overload/error indication (NC/NO) 3 AC-15/AC-14 at 230 V, 1 DC-13 at 24 V			
Output 2	BYPASSED	23/24				
Output 3	OVERLOAD/FAILURE	95/96/98				
Rated operational current		A	Protection by means of varistor through contact 4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)			
		A				
		A				
Protection against overvoltages						
Short-circuit protection						

¹⁾ Factory default: ON mode.

Type			3RW40 5.		3RW40 7.	
Control electronics						
Rated values		Terminal A1/A2				
Rated control supply voltage		V AC	115	230	115	230
• Tolerance		%	-15/+10		-15/+10	
Rated control supply current STANDBY		mA	15		15	
Rated control supply current ON ¹⁾		mA	440	200	660	360
Rated frequency		Hz	50/60		50/60	
• Tolerance		%	±10		±10	
Control inputs						
IN			ON/OFF			
Rated operational current		mA	Approx. 10 acc. to DIN 19240			
Rated operational voltage		V DC	24 from internal supply dc+ or external DC supply (acc. to DIN 19240) through terminals and IN			
Relay outputs						
Output 1	ON/RUN mode ²⁾	13/14	Operating indication (NO) Bypass indication (NO) Overload/error indication (NC/NO) 3 AC-15/AC-14 at 230 V, 1 DC-13 at 24 V			
Output 2	BYPASSED	23/24				
Output 3	OVERLOAD/FAILURE	95/96/98				
Rated operational current		A	Protection by means of varistor through contact 4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)			
		A				
		A				
Protection against overvoltages						
Short-circuit protection						

¹⁾ Values for the coil power consumption at +10 % U_n , 50 Hz.

²⁾ Factory default: ON mode.

³⁾ Actual motor start times are load dependent.

For Operation in the Control Cabinet

3RW Soft Starters

3RW40
for standard applications

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Type		3RW40 2., 3RW40 3., 3RW40 4.			
Control electronics					
Operating indications Off Start Bypass Ramp-down	LEDs	DEVICE Green Green Green Green	STATE/BYPASSED/FAILURE Off Green flashing Green Green flashing	OVERLOAD Off Off Off Off	
Alarm signals I_e /Class setting not permissible Start inhibited/thyristors too hot		Green Yellow flashing	Not relevant Not relevant	Red flashing Off	
Error signals • 24 V: $U < 0.75 \times U_s$ or $U > 1.25 \times U_s$ • 110 ... 230 V: $U < 0.75 \times U_s$ or $U > 1.15 \times U_s$ Non-permissible I_e /Class setting for edge 0 → 1 on input IN Motor protection shut-down (overload thermistor) Thermistor defective (open circuit, short-circuit) Thermal overloading of the thyristors Missing mains voltage, phase failure, missing load Device fault		Off Off Green Green Green Yellow Green Red	Red Red Red Off Off Red Red Red	Off Off Red flashing Red Red flickering Off Off Off	

Type		3RW40 5. and 3RW40 7.			
Control electronics					
Operating indications Off Start Bypass Ramp-down	LEDs	DEVICE Green Green Green Green	STATE/BYPASSED Off Green flashing Green Green flashing	FAILURE Off Off Off Off	OVERLOAD Off Off Off Off
Alarm signals I_e /Class setting not permissible Start inhibited/thyristors too hot		Green Yellow flashing	Not relevant Not relevant	Not relevant Not relevant	Red flashing Off
Error signals $U < 0.75 \times U_s$ or $U > 1.15 \times U_s$ Non-permissible I_e /Class setting for edge 0 → 1 on input IN Motor protection shut-down Thermal overloading of the thyristors Missing mains voltage, phase failure, missing load Device fault		Off Green Green Yellow Green Red	Off Off Off Off Off Off	Red Red Off Red Red Red	Off Red flashing Red Off Off Off

For Operation in the Control Cabinet

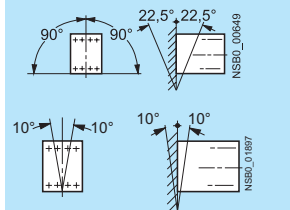
3RW Soft Starters

Type		3RW40 ..		
				Factory default
Protection functions				
Motor protection functions				
Trips in the event of				
Trip class to IEC 60947-4-1	Class	Thermal overloading of the motor	10/15/20	10
Phase failure sensitivity	%	> 40		
Overload warning		No		
Thermistor protection acc. to IEC 60947-8, type A/IEC 60947-5-1		Yes ¹⁾		
Reset option after tripping		Manual/automatic/remote reset ²⁾		
		(MAN/AUTO/REMOTE ²⁾)		
Recovery time	min	5		
Device protection functions				
Trips in the event of		Thermal overloading of the thyristors or bypass ³⁾		
Reset option after tripping		Manual/automatic/remote reset ²⁾		
		(MAN/AUTO/REMOTE ²⁾)		
Recovery time				
• During overloading of the thyristors	s	30		
• During overloading of the bypass	s	60		
Control times and parameters				
Control times				
Closing time (with connected control voltage)	ms	< 50		
Closing time (automatic/mains contactor mode)	ms	<300		
Recovery time (closing command in active ramp-down)	ms	100		
Mains failure bridging time				
Control supply voltage	ms	50		
Mains failure response time				
Load circuit	ms	500		
Reclosing lockout after overload trip				
Motor protection trip	min	5		
Device protection trip				
• During overloading of the thyristors	s	30		
• During overloading of the bypass	s	60		
Starting parameters				
Starting time	s	0 ... 20		7.5
Starting voltage	%	40 ... 100		40
Starting current limit		1.3 ... 5 x I _e		5 x I _e
Ramp-down parameters				
Ramp-down time	s	0 ... 20		0
Reset mode parameters (for motor/device protection shut-down)				
Manual reset	LEDs	Off		Off
Automatic reset	LEDs	Yellow		
Remote reset (REMOTE) ²⁾	LEDs	Green		
Start-up detection		Yes		
Operating mode output 13/14				
Rising edge at	Start command			
Falling edge at	Off command			
	Ramp-down end	ON		ON
		RUN		

¹⁾ Optional up to size S3 (device variant).

²⁾ Integrated remote reset (REMOTE) available only for 3RW40 2. to 3RW40 4.; remote reset with 3RU19 accessory module available for 3RW40 5. and 3RW40 7..

³⁾ Bypass protection up to size S3.

Type		3RW40 2...B.4, 3RW40 3...B.4, 3RW40 4...B.4	3RW40 2...B.5, 3RW40 3...B.5, 3RW40 4...B.5	3RW40 5...BB.4, 3RW40 7...BB.4	3RW40 5...BB.5, 3RW40 7...BB.5
Power electronics					
Rated operational voltage	V AC	200 ... 480	400 ... 600	200 ... 460	400 ... 600
Tolerance	%	-15/+10	-15/+10	-15/+10	-15/+10
Maximum blocking voltage (thyristor)	V AC	1600	1400	1800	
Rated frequency	Hz	50/60			
Tolerance	%	±10			
Uninterrupted duty at 40 °C (% of I_e)	%	115			
Minimum load (% of minimum selectable rated motor current I_M)	%	20 (at least 2 A)			
Maximum cable length between soft starter and motor	m	300			
Permissible installation height	m	5000 (derating from 1000, see characteristic curves); higher on request			
Permissible mounting position		 <p>-- (fan integrated in the soft starter)</p>			
Permissible mounting position		<ul style="list-style-type: none"> • With auxiliary fan (for 3RW40 2. ... 3RW40 4.) • Without auxiliary fan (for 3RW40 2. ... 3RW40 4.) 			
Permissible ambient temperature					
Operation	°C	-25 ... +60; (derating from +40)			
Storage	°C	-40 ... +80			
Degree of protection		IP20 for 3RW40 2.; IP00 for 3RW40 3. and 3RW40 4.		IP00	

Type		3RW40 24	3RW40 26	3RW40 27	3RW40 28
Power electronics					
40 °C/50 °C/60 °C					
Load rating with rated operational current I_e					
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
Smallest adjustable rated motor current I_M					
For the motor overload protection	A	5	10	17	23
Power loss					
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	2	8	13	19
• During starting with 300 % I_M (40°C)	W	17	47	55	64
Permissible rated motor current and starts per hour					
• Normal starting (Class 10)					
- Rated motor current $I_M^{(2)}$, starting time 3 s	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	50	23	23	19
- Rated motor current $I_M^{(2)(4)}$, starting time 4 s	A	12.5/11/10	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	36	15	16	12
• Normal starting (Class 15)					
- Rated motor current $I_M^{(2)}$, starting time 4.5 s	A	11/10/9	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	49	21	18	18
- Rated motor current $I_M^{(2)(4)}$, starting time 6 s	A	11/10/9	25.3/23/21	32.2/29/26	38/34/31
- Starts per hour ³⁾	1/h	36	14	13	13
• Normal starting (Class 20)					
- Rated motor current $I_M^{(2)}$, starting time 6 s	A	10/9/8	21/19/17	27/24/21	31/28/25
- Starts per hour ³⁾	1/h	47	21	20	18
- Rated motor current $I_M^{(2)(4)}$, starting time 8 s	A	10/9/8	21/19/17	27/24/21	31/28/25
- Starts per hour ³⁾	1/h	34	15	14	13

¹⁾ Measurement at 60 °C according to UL/CSA not required.

²⁾ With 300 % I_M .

³⁾ For intermittent duty S4 with ON period = 30 %, T_u = 40 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

⁴⁾ Maximum adjustable rated motor current I_M , dependent on CLASS setting.

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

Type		3RW40 36	3RW40 37	3RW40 38	3RW40 46	3RW40 47
Power electronics		40 °C/50 °C/60 °C				
Load rating with rated operational current I_e						
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
Smallest adjustable rated motor current I_M						
For the motor overload protection	A	23	26	35	43	46
Power loss						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	6	12	15	12	21
• During starting with 300 % I_M (40 °C)	W	79	111	125	144	192
Permissible rated motor current and starts per hour						
• Normal starting (Class 10)						
- Rated motor current $I_M^{(2)}$, starting time 3 s	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
- Starts per hour ³⁾	1/h	38	23	22	22	15
- Rated motor current $I_M^{(2/4)}$, starting time 4 s	A	45/42/39	63/58/53	72/63/60	80/73/66	106/98/90
- Starts per hour ³⁾	1/h	26	15	15	15	10
• Normal starting (Class 15)						
- Rated motor current $I_M^{(2)}$, starting time 4.5 s	A	42/38/34	50/46/42	56/52/46	70/64/58	84/77/70
- Starts per hour ³⁾	1/h	30	34	34	24	23
- Rated motor current $I_M^{(2/4)}$, starting time 6 s	A	42/38/34	50/46/42	56/52/46	70/64/58	84/77/70
- Starts per hour ³⁾	1/h	21	24	24	16	17
• Normal starting (Class 20)						
- Rated motor current $I_M^{(2)}$, starting time 6 s	A	38/34/30	46/42/38	50/46/42	64/58/52	77/70/63
- Starts per hour ³⁾	1/h	30	31	34	23	23
- Rated motor current $I_M^{(2/4)}$, starting time 8 s	A	38/34/30	46/42/38	50/46/42	64/58/52	77/70/63
- Starts per hour ³⁾	1/h	21	22	24	16	16

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .

3) For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I_M , dependent on CLASS setting.




Type		3RW40 55	3RW40 56	3RW40 73	3RW40 74	3RW40 75	3RW40 76
Power electronics		40 °C/50 °C/60 °C					
Load rating with rated operational current I_e							
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	134/117/100	162/145/125	230/205/180	280/248/215	356/315/280	432/385/335
Smallest adjustable rated motor current I_M							
For the motor overload protection	A	59	87	80	130	131	207
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	60	75	75	90	125	165
• During starting with 300 % I_M (40 °C)	W	1043	1355	2448	3257	3277	3600
Permissible rated motor current and starts per hour							
• Normal starting (Class 10)							
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	134/117/100	162/145/125	230/205/180	280/248/215	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	20	8	20	20	16	17
- Rated motor current $I_M^{(2/4)}$, starting time 20 s	A	134/117/100	162/145/125	230/205/180	280/248/215	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	7	1.4	9	8	5	5
• Normal starting (Class 15)							
- Rated motor current $I_M^{(2)}$, starting time 15 s	A	134/117/100	152/140/125	210/200/180	250/220/190	341/315/280	402/385/335
- Starts per hour ³⁾	1/h	11	8	11	13	11	12
- Rated motor current $I_M^{(2/4)}$, starting time 30 s	A	134/117/100	152/140/125	210/200/180	250/220/190	341/315/280	402/385/335
- Starts per hour ³⁾	1/h	1.2	1.7	1	6	2	2
• Normal starting (Class 20)							
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	124/112/100	142/132/120	200/185/168	230/205/180	311/280/250	372/340/305
- Starts per hour ³⁾	1/h	12	9	10	10	10	10
- Rated motor current $I_M^{(2/4)}$, starting time 40 s	A	124/112/100	142/132/120	200/185/168	230/205/180	311/280/250	372/340/305
- Starts per hour ³⁾	1/h	3	3	1	5	1	1

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .

3) For intermittent duty S4 with ON period = 30 %, $T_U = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I_M , dependent on CLASS setting.






Soft starters	Type		3RW40 2.	3RW40 3.	3RW40 4.
Conductor cross-sections					
Screw terminals	Main conductors				
Front clamping point connected 	• Solid	mm ²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6) acc. to IEC 60947; max. 1 x 10	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm ²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6)	1 x (0.75 ... 25)	1 x (2.5 ... 35)
	• Stranded	mm ²	--	1 x (0.75 ... 35)	1 x (4 ... 70)
	• AWG cables				
	- Solid	AWG	2 x (16 ... 12)		
Rear clamping point connected 	- Solid or stranded	AWG	2 x (14 ... 10)	1 x (18 ... 2)	2 x (10 ... 1/0)
	- Stranded	AWG	1 x 8	--	--
	• Solid	mm ²	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm ²	--	1 x (1.5 ... 25)	1 x (2.5 ... 50)
	• Stranded	mm ²	--	1 x (1.5 ... 35)	1 x (10 ... 70)
Both clamping points connected 	• AWG cables				
	- Solid or stranded	AWG	--	1 x (16 ... 2)	2 x (10 ... 1/0)
	• Solid	mm ²	--	2 x (1.5 ... 16)	2 x (2.5 ... 16)
	• With end sleeve	mm ²	--	2 x (1.5 ... 16)	2 x (2.5 ... 35)
	• Stranded	mm ²	--	2 x (1.5 ... 25)	2 x (10 ... 50)
	• AWG cables				
	- Solid or stranded	AWG	--	2 x (16 ... 2)	1 x (10 ... 2/0)
	• Tightening torque	NM lb.in	2 ... 2.5 18 ... 22	4.5 40	6.5 58
	Tools		PZ 2	PZ 2	Allen screw 4 mm
	Degree of protection		IP20	IP20 (IP00 terminal compartment)	IP20 (IP00 terminal compartment)
Spring-type terminals	Main conductors				
	• Solid	mm ²	1 ... 10	--	
	• Finely stranded with end sleeve	mm ²	1 ... 6 end sleeves with- out plastic collar	--	
	• AWG cables				
	- Solid or stranded (finely stranded)	AWG	16 ... 10	--	
	- Stranded	AWG	1 x 8	--	
	Tools		DIN ISO 2380-1A0; 5 x 3	--	
	Degree of protection		IP20	--	
Busbar connections	Main conductors				
	• With cable lug acc. to DIN 46234 or max. 20 mm wide				
	- Stranded	mm ²	--		2 x (10 ... 70)
	- Finely stranded	mm ²	--		2 x (10 ... 50)
	• AWG cables, solid or stranded	AWG	--		2 x (7 ... 1/0)

For Operation in the Control Cabinet

3RW Soft Starters

3RW40

for standard applications

Soft starters	Type		3RW40 5.	3RW40 7.
Conductor cross-sections				
Screw terminals	Main conductors			
With box terminal			3RT19 55-4G (55 kW)	3RT19 66-4G
Front clamping point connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm AWG	16 ... 70 16 ... 70 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	70 ... 240 70 ... 240 95 ... 300 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 3/0 ... 600 kcmil
				
Rear clamping point connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm AWG	16 ... 70 16 ... 70 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	120 ... 185 120 ... 185 120 ... 240 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 250 ... 500 kcmil
				
Both clamping points connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded Terminal screws - Tightening torque 	mm ² mm ² mm ² mm AWG NM lb.in	Max. 1 x 50, 1 x 70 Max. 1 x 50, 1 x 70 Max. 2 x 70 Max. 2 x (6 x 15.5 x 0.8) Max. 2 x 1/0 M10 (hexagon socket, A/F4) 10 ... 12 90 ... 110	Min. 2 x 50; max. 2 x 185 Min. 2 x 50; max. 2 x 185 Max. 2 x 70; max. 2 x 240 Max. 2 x (20 x 24 x 0.5) Min. 2 x 2/0 Max. 2 x 500 kcmil M12 (hexagon socket, A/F5) 20 ... 22 180 ... 195
				
Screw terminals	Main conductors			
With box terminal			3RT19 56-4G	
Front or rear clamping point connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm AWG	16 ... 120 16 ... 120 16 ... 120 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 250 kcmil	
				
Both clamping points connected	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm AWG	Max. 1 x 95, 1 x 120 Max. 1 x 95, 1 x 120 Max. 2 x 120 Max. 2 x (10 x 15.5 x 0.8) Max. 2 x 3/0	
				
Screw terminals	Main conductors			
	<u>Without box terminal/busbar connection</u>			
	<ul style="list-style-type: none"> Finely stranded with cable lug Stranded with cable lug AWG cables, solid or stranded Connecting bar (max. width) Terminal screws - Tightening torque 	mm ² mm ² AWG mm NM lb.in	16 ... 95 ¹⁾ 25 ... 120 ¹⁾ 4 ... 250 kcmil 17 M8 x 25 (A/F13) 10 ... 14 89 ... 124	50 ... 240 ²⁾ 70 ... 240 ²⁾ 2/0 ... 500 kcmil 25 M10 x 30 (A/F17) 14 ... 24 124 ... 210

¹⁾ When connecting cable lugs to DIN 46235, use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm² to ensure phase spacing.

²⁾ When connecting cable lugs to DIN 46234, the 3RT19 66-4EA1 terminal cover must be used for cond. cross-sections of 240 mm² and more as well as DIN 46235 for cond. cross-sections of 185 mm² and more to keep the phase clearance.

Soft starters	Type		3RW40 ..
Conductor cross-sections			
Auxiliary conductors (1 or 2 conductors can be connected):			
	Screw terminals		
	<ul style="list-style-type: none"> Solid Finely stranded with end sleeve AWG cables - Solid or stranded - Finely stranded with end sleeve Terminal screws - Tightening torque 	mm ² mm ² AWG AWG NM lb.in	2 x (0.5 ... 2.5) 2 x (0.5 ... 1.5) 2 x (20 ... 14) 2 x (20 ... 16) 0.8 ... 1.2 7 ... 10.3
	Spring-type terminals		
	<ul style="list-style-type: none"> Solid - 3RW40 2. ... 3RW40 4. - 3RW40 5., 3RW40 7. Finely stranded with end sleeve AWG cables, solid or stranded 	mm ² mm ² mm ² AWG	2 x (0.25 ... 2.5) 2 x (0.25 ... 1.5) 2 x (0.25 ... 1.5) 2 x (24 ... 14) for 3RW40 2. ... 3RW40 4.; 2 x (24 ... 16) for 3RW40 5. and 3RW40 7.

For Operation in the Control Cabinet

3RW Soft Starters

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	Standard	Parameters
Electromagnetic compatibility acc. to EN 60947-4-2		
EMC interference immunity		
Electrostatic discharge (ESD)	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Frequency range: 80 ... 1000 MHz with 80 % at 1 kHz Degree of severity 3: 10 V/m
Conducted RF interference	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V
RF voltages and RF currents on cables		
• Burst	EN 61000-4-4	±2 kV/5 kHz
• Surge	EN 61000-4-5	±1 kV line to line ±2 kV line to earth
EMC interference emission		
EMC interference field strength	EN 55011	Limit value of Class A at 30 ... 1000 MHz, limit value of Class B with 3RW40 2. 24 V AC/DC
Radio interference voltage	EN 55011	Limit value of Class A at 0.15 ... 30 MHz, limit value of Class B with 3RW40 2. 24 V AC/DC
Radio interference suppression filters		
Degree of noise suppression A (industrial applications)	Not required	
Degree of noise suppression B (applications for residential areas) Control voltage • 110 ... 230 V AC/DC • 115/230 V AC • 24 V AC/DC	Not available ¹⁾ Not available ¹⁾ Not required for 3RW40 2.; required for 3RW40 3. and 3RW40 4. (see table)	

¹⁾ Degree of noise suppression B cannot be obtained through the use of filters as the strength of the electromagnetic field is not attenuated by the filter.

Soft starter type	Rated current Soft starters A	Recommended filters ¹⁾		
		Voltage range 200 ... 480 V Filter type	Rated current filters A	Terminals mm ²
3RW40 36	45	4EF1512-1AA10	50	16
3RW40 37	63	4EF1512-2AA10	66	25
3RW40 38	72	4EF1512-3AA10	90	25
3RW40 46	80	4EF1512-3AA10	90	25
3RW40 47	106	4EF1512-4AA10	120	50

¹⁾ The radio interference suppression filter is used to remove the conducted interference from the main circuit. The field-related emissions comply with degree of noise suppression B. Filter selection applies under standard conditions: 10 starts per hour, start time 4 s at 300 % I_N .

Type Number	Max. Fuse Class K5, RK5, RK1	Max. Fuse Class J	Short Voltage Circuit	Voltage
Standard short circuit ratings 3RW40				
3RW40 24	50 A	60 A	5 kA	600 V
3RW40 26	100 A	100 A	5 kA	600 V
3RW40 27	125 A	125 A	5 kA	600 V
3RW40 28	125 A	125 A	5 kA	600 V
3RW40 36	175 A	175 A	10 kA	600 V
3RW40 37	250 A	250 A	10 kA	600 V
3RW40 38	250 A	250 A	10 kA	600 V
3RW40 46	450 A ¹⁾	300 A	10 kA	600 V
3RW40 47	450 A ¹⁾	350 A	10 kA	600 V

¹⁾ Special purpose fuse Type 3N81333-2 manufactured by Siemens covered in File E167357.

High capacity short circuit ratings 3RW40

3RW40 24	50 A	50 A	42 kA	600 V
3RW40 26	60 A	100 A	42 kA	600 V
3RW40 27	60 A	125 A	42 kA	600 V
3RW40 28	60 A	125 A	42 kA	600 V
3RW40 36	100 A	175 A	30 kA	600 V
3RW40 37	100 A	200 A	30 kA	600 V
3RW40 38	100 A	200 A	30 kA	600 V
3RW40 46	110 A	200 A	42 kA	600 V
3RW40 47	110 A	200 A	42 kA	600 V

For solid-state motor controller, Type 3RW402: Applicable in an enclosure with minimum overall dimensions of 370 by 190 by 190 mm.

For solid-state motor controller, Type 3RW403: Applicable in an enclosure with minimum overall dimensions of 450 by 210 by 225 mm.

For solid-state motor controller, Type 3RW404: Applicable in an enclosure with minimum overall dimensions of 450 by 220 by 235 mm.

For Operation in the Control Cabinet

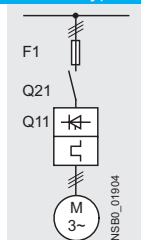
3RW Soft Starters

3RW40 for standard applications

Circuit Breaker SCCR

Q11 Type	Rated current	Circuit Breakers												Fuse					
		Thermal Magnetic						Instantaneous Trip											
		480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A
3RW40 24	11																		
3RW40 26	23																		
3RW40 27	29																		
3RW40 28	34																		
3RW40 36	42																		
3RW40 37	58																		
3RW40 38	62																		
3RW40 46	73																		
3RW40 47	98																		
3RW40 55	117	FD63B	100	150	FD63B	50	150	FXD63A	100	150	FXD63A	50	150	RK5	100	200	J	100	400
3RW40 56	145	JD63B	100	200	JD63B	50	250	FXD63A	100	250	FXD63A	50	250	RK5	100	250	J	100	500
3RW40 73	205	JD63B	100	300	JD63B	50	300	JXD63A	100	300	JXD63A	50	300	RK5	100	250			
3RW40 74	248	JD63B	100	400	JD63B	50	400	JXD63A	100	400	JXD63A	50	400	RK5	100	450			
3RW40 75	315	LD63B	100	500	LD63B	50	450	JXD63A	100	400	JXD63A	50	400	RK5	100	600			
3RW40 76	385	LD63B	100	600	LD63B	50	600	LXD63H	100	600	LXD63H	50	600	L	100	700			

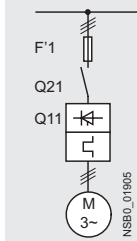
Fused version (line protection only)



Soft starters <div>1</div>	Rated current	Line protection, maximum		Size	Line contactors
		F1	Rated current		(optional)
Q11 Type	A	Type	A		Q21
Type of coordination "1"1): Iq = 65 kA at 600 V +5 %					
3RW40 24	12.5	3NA3 820-6	50	00	3RT10 24
3RW40 26	25	3NA3 822-6	63	00	3RT10 26
3RW40 27	32	3NA3 824-6	80	00	3RT10 34
3RW40 28	38	3NA3 824-6	80	00	3RT10 35
3RW40 36	45	3NA3 130-6	100	1	3RT10 36
3RW40 37	63	3NA3 132-6	125	1	3RT10 44
3RW40 38	72	3NA3 132-6	125	1	3RT10 45
3RW40 46	80	3NA3 136-6	160	1	3RT10 45
3RW40 47	106	3NA3 136-6	160	1	3RT10 46
3RW40 55	134	3NA3 244-6	250	2	3RT10 55-6A.36
3RW40 56	162	3NA3 244-6	250	2	3RT10 56-6A.36
3RW40 73	230	2 x 3NA3 354-6	2 x 355	3	3RT10 65-6A.36
3RW40 74	280	2 x 3NA3 354-6	2 x 355	3	3RT10 66-6A.36
3RW40 75	356	2 x 3NA3 365-6	2 x 500	3	3RT10 75-6A.36
3RW40 76	432	2 x 3NA3 365-6	2 x 500	3	3RT10 76-6A.36

¹⁾ The types of coordination are explained under "3RA1 Fuseless Load Feeders". The type of coordination "1" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

Fused version with 3NE1 SITOR fuses (semiconductor and line protection)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" —> "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" —> "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor —> "Products" —> "BETA Protecting" —> "SITOR"

Soft starters <div><div>ToC</div><div>2</div></div>	All-range fuses			Line contactors	
	Rated current		Rated current	Size	(optional)
	Q11 Type	A	F'1 Type	A	
Type of coordination "2" ⁿ¹⁾ : I _q = 65 kA at 600 V +5 %					
3RW40 24	12.5	3NE1 814-0	20	000	3RT10 24
3RW40 26	25	3NE1 803-0	35	000	3RT10 26
3RW40 27	32	3NE1 020-2	80	00	3RT10 34
3RW40 28	38	3NE1 020-2	80	00	3RT10 35
3RW40 36	45	3NE1 020-2	80	00	3RT10 36
3RW40 37	63	3NE1 820-0	80	000	3RT10 44
3RW40 38	72	3NE1 820-0	80	000	3RT10 45
3RW40 46	80	3NE1 021-0	100	00	3RT10 45
3RW40 47	106	3NE1 022-0	125	00	3RT10 46
3RW40 55	134	3NE1 227-2	250	1	3RT10 55-6A.36
3RW40 56	162	3NE1 227-2	250	1	3RT10 56-6A.36
3RW40 73	230	3NE1 331-2	350	2	3RT10 65-6A.36
3RW40 74	280	3NE1 333-2	450	2	3RT10 66-6A.36
3RW40 75	356	3NE1 334-2	500	2	3RT10 75-6A.36
3RW40 76	432	3NE1 435-2	560	3	3RT10 76-6A.36

¹⁾ The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".
The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (circuit breaker/fuse), not to any additional components in the feeder.

ToC
1

Type of coordination "1"

ToC
2

Type of coordination "2"

The types of coordination are explained in more detail under "3RA1 Fuseless Load Feeders".

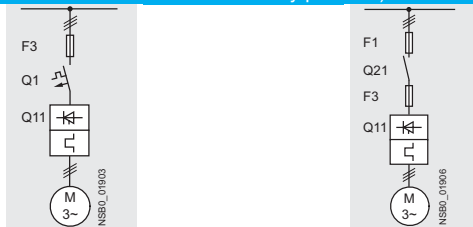
These types of coordination are indicated in the Technical specifications by gray backgrounds.

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

Fused version with 3NE3 SITOR fuses (semiconductor protection by fuse, line and overload protection by motor starter protector; alternatively, installation with contactor and overload relay possible)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" —> "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" —> "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor —> "Products" —> "BETA Protecting" —> "SITOR"

Soft starters		Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses, minimum		
Q11 Type	Rated current A	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size
Type of coordination "2" ¹⁾ : $I_q = 65 \text{ kA at } 600 \text{ V } +5 \%$										
3RW40 24	12.5	--	--	--	--	--	--	3NE4 101	32	0
3RW40 26	25	--	--	--	3NE3 221	100	1	3NE4 102	40	0
3RW40 27	32	--	--	--	3NE3 224	160	1	3NE4 118	63	0
3RW40 28	38	--	--	--	3NE3 224	160	1	3NE4 118	63	0
3RW40 36	45	--	--	--	3NE3 224	160	1	3NE4 120	80	0
3RW40 37	63	--	--	--	3NE3 225	200	1	3NE4 121	100	0
3RW40 38	72	3NE3 221	100	1	3NE3 227	250	1	--	--	--
3RW40 46	80	3NE3 222	125	1	3NE3 225	200	1	--	--	--
3RW40 47	106	3NE3 224	160	1	3NE3 231	350	1	--	--	--
3RW40 55	134	3NE3 227	250	1	3NE3 335	560	2	--	--	--
3RW40 56	162	3NE3 227	250	1	3NE3 335	560	2	--	--	--
3RW40 73	230	3NE3 232-0B	400	1	3NE3 333	450	2	--	--	--
3RW40 74	280	3NE3 233	450	1	3NE3 336	630	2	--	--	--
3RW40 75	356	3NE3 335	560	2	3NE3 336	630	2	--	--	--
3RW40 76	432	3NE3 337-8	710	2	3NE3 340-8	900	2	--	--	--

Soft starters		Semiconductor fuses max.			Semiconductor fuses min.			Semiconductor fuses max.			Cylindrical fuses	
Q11 Type	Rated current A	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A	Size	F3 Type	Rated current A
Type of coordination "2" ¹⁾ : $I_q = 65 \text{ kA at } 600 \text{ V } +5 \%$												
3RW40 24	12.5	3NE4 117	50	0	3NE8 015-1	25	00	3NE8 017-1	50	00	3NC2 240	40
3RW40 26	25	3NE4 117	50	0	3NE8 017-1	50	00	3NE8 021-1	100	00	3NC2 263	63
3RW40 27	32	3NE4 118	63	0	3NE8 018-1	63	00	3NE8 022-1	125	00	3NC2 280	80
3RW40 28	38	3NE4 118	63	0	3NE8 020-1	80	00	3NE8 024-1	160	00	3NC2 280	80
3RW40 36	45	3NE4 120	80	0	3NE8 020-1	80	00	3NE8 024-1	160	00	3NC2 280	80
3RW40 37	63	3NE4 121	100	0	3NE8 021-1	100	00	3NE8 024-1	160	00	--	--
3RW40 38	72	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW40 46	80	--	--	--	3NE8 022-1	125	00	3NE8 024-1	160	00	--	--
3RW40 47	106	--	--	--	3NE8 024-1	160	00	3NE8 024-1	160	00	--	--
3RW40 55	134	--	--	--	--	--	--	--	--	--	--	--
3RW40 56	162	--	--	--	--	--	--	--	--	--	--	--
3RW40 73	230	--	--	--	--	--	--	--	--	--	--	--
3RW40 74	280	--	--	--	--	--	--	--	--	--	--	--
3RW40 75	356	--	--	--	--	--	--	--	--	--	--	--
3RW40 76	432	--	--	--	--	--	--	--	--	--	--	--

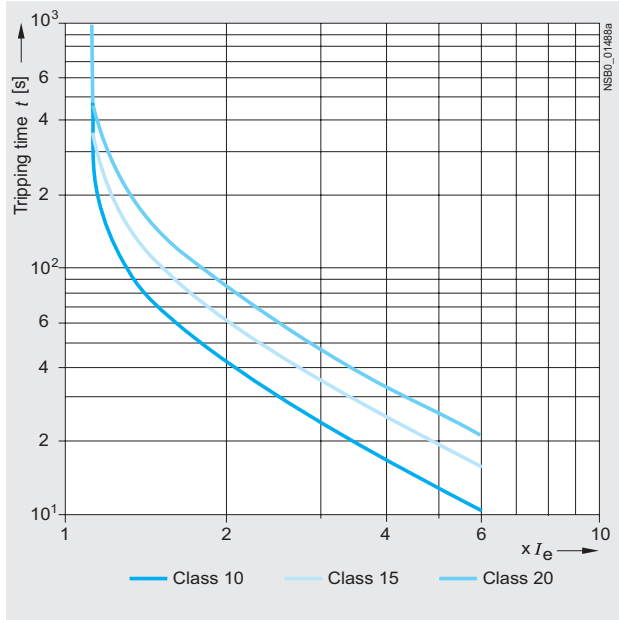
Soft starters		Line contactors		Motor starter protectors/circuit breakers				Line protection, maximum		
Q11 Type	Rated current A	Q21 (optional)	400 V +10 %	Rated current A	575 V +10 %	Rated current A	Rated current A	Rated current A	Size	Size
Type of coordination "2" ¹⁾ : $I_q = 65 \text{ kA at } 600 \text{ V } +5 \%$										
3RW40 24	12.5	3RT10 24	3RV1 021-4KA10	55	--	--	3NA3 820-6	50	00	00
3RW40 26	25	3RT10 26	3RV1 021-4DA10	55	--	--	3NA3 822-6	63	00	00
3RW40 27	32	3RT10 34	3RV1 031-4EA10	55	--	--	3NA3 824-6	80	00	00
3RW40 28	38	3RT10 35	3RV1 031-4FA10	55	--	--	3NA3 824-6	80	00	00
3RW40 36	45	3RT10 36	3RV1 031-4GA10	20	--	--	3NA3 130-6	100	1	1
3RW40 37	63	3RT10 44	3RV1 041-4JA10	20	--	--	3NA3 132-6	125	1	1
3RW40 38	72	3RT10 45	3RV1 041-4KA10	20	--	--	3NA3 132-6	125	1	1
3RW40 46	80	3RT10 45	3RV1 041-4LA10	11	--	--	3NA3 136-6	160	1	1
3RW40 47	106	3RT10 46	3RV1 041-4MA10	11	--	--	3NA3 136-6	160	1	1
3RW40 55	134	3RT10 55-6A.36	3VL3 720	200	3VL3 720	200	3NA3 244-6	250	2	2
3RW40 56	162	3RT10 56-6A.36	3VL3 720	200	3VL3 720	200	3NA3 244-6	250	2	2
3RW40 73	230	3RT10 65-6A.36	3VL4 731	315	3VL5 731	315	2 x 3NA3 354-6	2 x 355	3	3
3RW40 74	280	3RT10 66-6A.36	3VL4 731	315	3VL5 731	315	2 x 3NA3 354-6	2 x 355	3	3
3RW40 75	356	3RT10 75-6A.36	3VL4 740	400	3VL5 740	400	2 x 3NA3 365-6	2 x 500	3	3
3RW40 76	432	3RT10 76-6A.36	3VL5 750	500	3VL5 750	500	2 x 3NA3 365-6	2 x 500	3	3

¹⁾ The types of coordination are explained under "3RA1 Fuseless Load Feeders". The type of coordination "2" refers only to soft starters in combination

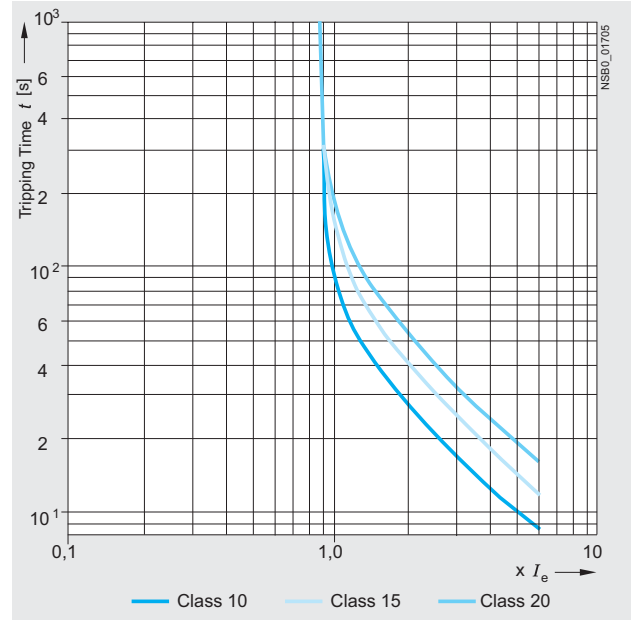
with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

Characteristic curves

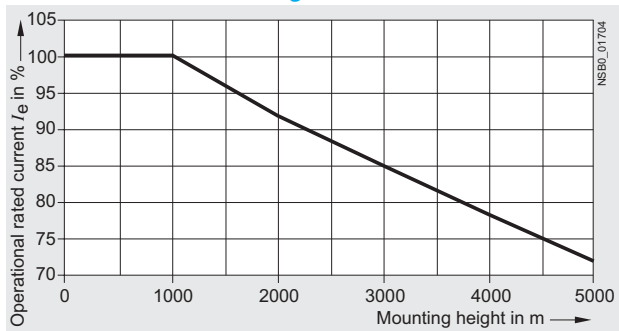
Motor protection tripping characteristics for 3RW40 (with symmetry)



Motor protection tripping characteristics for 3RW40 (with asymmetry)



Permissible installation height



At an installation height above 2000 m, the max. permissible operational voltage is reduced to 460 V.

For Operation in the Control Cabinet

3RW Soft Starters

3RW40 for standard applications

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n \text{ motor}}$).

The soft starter rating can be selected to be as high as the rating of the motor used.

Application		Conveyor belt	Roller conveyor	Small fan	Pump	Hydraulic pump
Starting parameters						
<ul style="list-style-type: none"> Voltage ramp and current limiting 						
- Starting voltage	%	70	60	40	40	40
- Starting time	s	10	10	10	10	10
- Current limit value		$5 \times I_M$	$5 \times I_M$	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
Ramp-down time	s	5	5	0	10	0

Application examples for heavy starting (Class 20)

Heavy starting Class 20 (up to 40 s with 350 % $I_{n \text{ motor}}$).

The soft starter has to be selected at least one performance class higher than the motor used.

Application		Stirrer	Compressor	Centrifuge
Starting parameters				
<ul style="list-style-type: none"> Voltage ramp and current limiting 				
- Starting voltage	%	40	50	40
- Starting time	s	20	10	20
- Current limit value		$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
Ramp-down time		0	0	0

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during commissioning.

The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

Configuration

The 3RW solid-state soft starters are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

Where long starting times are involved, the integrated solid-state overload relay for heavy starting should not be disconnected. PTC sensors are recommended. This also applies for the smooth ramp-down because during the ramp-down time an additional current loading applies in contrast to free ramp-down.

In the case of high switching frequencies in S4 mode, Siemens recommends the use of PTC sensors. For corresponding device versions with integrated thermistor motor protection or separate thermistor evaluation devices see Catalog LV 1.

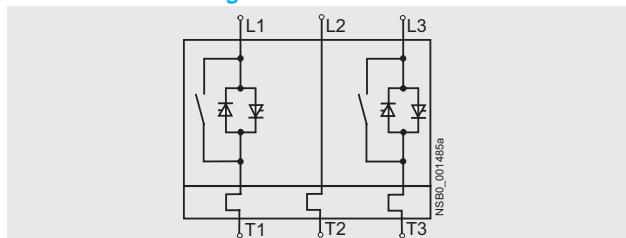
In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

Note:

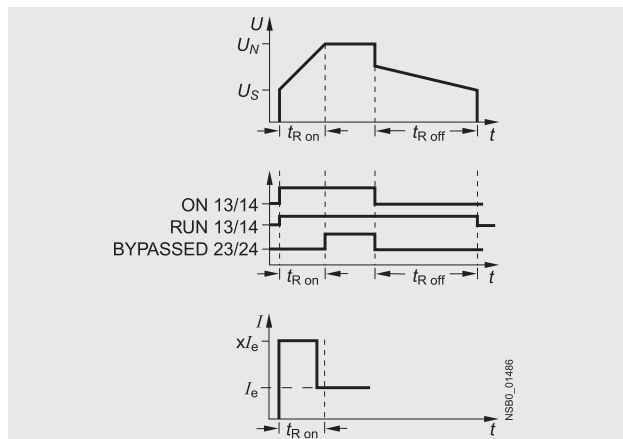
When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Schematic circuit diagram



A bypass contact system and solid-state overload relay are already integrated in the 3RW40 soft starter and therefore do not have to be ordered separately.

Status graphs



Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:

www.usa.siemens.com > Software

More information can be found on the Internet at:

www.usa.siemens.com.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Overview

In addition to soft starting and soft ramp-down, the solid-state SIRIUS 3RW44 soft starters provide numerous functions for higher-level requirements. They cover a performance range up to 900 Hp (at 460 V) in the inline circuit and up to 1600 Hp (at 460 V) in the inside-delta circuit.

The SIRIUS 3RW44 soft starters are characterized by a compact design for space-saving and clearly arranged control cabinet layouts. For optimized motor starting and stopping the innovative SIRIUS 3RW44 soft starters are an attractive alternative with considerable savings potential compared to applications with a frequency converter. The new torque control and adjustable current limiting enable the High-Feature soft starters to be used in nearly every conceivable task. They reliably mitigate the sudden torque applications and current peaks during motor starting and stopping. This creates savings potential when calculating the size of the controlgear and when servicing the machinery installed. Be it for inline circuits or inside-delta circuits – the SIRIUS 3RW44 soft starter offers savings especially in terms of size and equipment costs.

The bypass contacts already integrated in the soft starter bypass the thyristors after a motor ramp-up is detected. This results in a further great reduction in the heat loss occurring during operation of the soft starter at rated value.

Combinations of various starting, operating and ramp-down possibilities ensure an optimum adaptation to the application-specific requirements. Operation and commissioning can be performed with the menu-controlled keypad and a menu-prompted, multi-line graphic display with background lighting. The optimized motor ramp-up and ramp-down can be effected quickly, easily and reliably by means of just a few settings with a previously selected language. Four-key operation and plain-text displays for each menu point guarantee full clarity at every moment of the parameterization and operation.

Applicable standards

- IEC 60947-4-2
- UL/CSA

Soft Starter ES parameterization software

Soft Starter ES software is used for the parameterization, monitoring and service diagnostics of SIRIUS 3RW44 High Feature soft starters.

See Catalog LV 1, Chapter 12 "Planning and Configuration with SIRIUS".

Function

Equipped with modern, ergonomic user prompting the SIRIUS 3RW44 soft starters can be commissioned quickly and easily using a keypad and a menu-prompted, multi-line graphic display with background lighting. The optimized motor ramp-up and ramp-down can be effected quickly, easily and reliably by means of just a few settings with a selectable language. Four-key operation and plain-text displays for each menu point guarantee full clarity at every moment of the parameterization and operation. During operation and when control voltage is applied, the display field continuously presents measured values and operating values as well as warnings and fault messages. An external display and operator module can be connected by means of a connection cable to the soft starter, thus enabling active indications and the like to be read directly from the control cabinet door.

The SIRIUS 3RW44 soft starters are equipped with optimum functionality. An integral bypass contact system reduces the power loss of the soft starter during operation. This reliably prevents heating of the switchgear environment. The SIRIUS 3RW44 soft starters have internal intrinsic device protection. This prevents thermal overloading of the power section's thyristors, e. g. due to unacceptably high closing operations.

Wiring outlay for installing an additional motor overload relay is no longer needed as the SIRIUS 3RW44 soft starters perform this function too. In addition they offer adjustable trip classes and a thermistor motor protection function. As an option the thyristors can also be protected by SITOP semiconductor fuses from short-circuiting so that the soft starter is still functional after a short-circuit (type of coordination 2). And even inrush current peaks are reliably avoided thanks to adjustable current limiting.

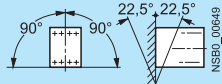
As a further option the SIRIUS 3RW44 soft starters can be upgraded with a PROFIBUS DP module. Thanks to their communication capability and their programmable control inputs and relay outputs the SIRIUS 3RW44 soft starters can be very easily and quickly integrated in higher-level controllers.

In addition a creep speed function is available for positioning and setting jobs. With this function the motor can be controlled in both directions of rotation with reduced torque and an adjustable, low speed.

On the other hand the SIRIUS 3RW44 soft starters offer a new, combined DC braking function for the fast stopping of driving loads.

Highlights

- Soft starting with breakaway pulse, torque control or voltage ramp, adjustable torque or current limiting as well as any combination of these, depending on load type
- Integrated bypass contact system to minimize power loss
- Various setting options for the starting parameters such as starting torque, starting voltage, ramp-up and ramp-down time, and much more in three separate parameter sets
- Start-up detection
- Inside-delta circuit for savings in terms of size and equipment costs
- Various ramp-down modes selectable: free ramp-down, torque-controlled pump ramp-down, combined DC braking
- Solid-state motor overload and intrinsic device protection
- Thermistor motor protection
- Keypad with a menu-prompted, multi-line graphic display with background lighting
- Interface for communication with the PC for more accurate setting of the parameters as well as for control and monitoring
- Simple adaptation to the motor feeder
- Simple mounting and commissioning
- Display of operating states and fault messages
- Connection to PROFIBUS with optional PROFIBUS DP module
- External display and operator module
- Mains voltages from 200 to 690 V, 50 to 60 Hz
- Applicable up to 60 °C (derating from 40 °C)

Type		3RW44 ...BC.4	3RW44 ...BC.5	3RW44 ...BC.6
Power electronics				
Rated operational voltage for inline circuit	V AC	200 ... 460	400 ... 600	400 ... 690
Tolerance	%	-15/+10	-15/+10	-15/+10
Maximum blocking voltage (thyristor)	V AC	1400	1800	1800
Rated operational voltage for inside-delta circuit	V AC	200 ... 460	400 ... 600	400 ... 600
Tolerance	%	-15/+10	-15/+10	-15/+10
Rated frequency	Hz	50 ... 60		
Tolerance	%	±10		
Uninterrupted duty at 40 °C (% of I_e)	%	115		
Minimum load (% of set motor current I_M)	%	8		
Maximum cable length between soft starter and motor	m	500 ¹⁾		
Permissible installation height	m	5000 (derating from 1000, see characteristic curves); higher on request		
Permissible mounting position		 <p>Stand-alone installation</p> <p>① ≥ 5 mm (≥ 0.2 in) ② ≥ 75 mm (≥ 3 in) ③ ≥ 100 mm (≥ 4 in)</p>		
Installation type				
Permissible ambient temperature				
Operation	°C	0 ... +60; (derating from +40)		
Storage	°C	-25 ... +80		
Degree of protection		IP00		

¹⁾ At the project configuration stage, it is important to make allowance for the voltage drop on the motor cable up to the motor connection. If necessary,

higher values for the rated operational voltage or current must be calculated accordingly for the soft starter.

Type		3RW44 22	3RW44 23	3RW44 24	3RW44 25	3RW44 26	3RW44 27
Power electronics							
40 °C/50 °C/60 °C							
Load rating with rated operational current I_e							
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
Smallest adjustable rated motor current I_M For the motor overload protection	A	5	7	9	11	15	18
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	8	10	32	36	45	55
• During starting with 300 % I_M (40 °C)	W	400	470	600	725	940	1160
Permissible rated motor current and starts per hour							
• Normal starting (Class 5)							
- Rated motor current $I_M^{(2)}$, starting time 5 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	41	34	41	42	43	44
- Rated motor current $I_M^{(2)(4)}$, starting time 10 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	20	15	20	20	20	20
• Normal starting (Class 10)							
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	20	15	20	20	20	20
- Rated motor current $I_M^{(2)(4)}$, starting time 20 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	10	6	10	10	8	8
• Normal starting (Class 15)							
- Rated motor current $I_M^{(2)}$, starting time 15 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	13	9	13	13	13	13
- Rated motor current $I_M^{(2)(4)}$, starting time 30 s	A	29/26/23	36/33/29	47/42/37	57/51/45	77/68/59	93/82/72
- Starts per hour ³⁾	1/h	6	4	6	6	6	6
• Normal starting (Class 20)							
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	29/26/23	36/33/29	47/42/37	57/51/45	73/66/59	88/80/72
- Starts per hour ³⁾	1/h	10	6	10	10	10	10
- Rated motor current $I_M^{(2)(4)}$, starting time 30 s	A	29/26/23	36/33/29	47/42/37	57/51/45	73/66/59	88/80/72
- Starts per hour ³⁾	1/h	4	2	4	5	1.8	0.8
• For very heavy starting (Class 30)							
- Rated motor current $I_M^{(2)}$, starting time 30 s	A	29/26/23	36/33/29	44/42/37	57/51/45	65/60/54	77/70/63
- Starts per hour ³⁾	1/h	6	4	6	6	6	6
- Rated motor current $I_M^{(2)(3)}$, starting time 60 s	A	29/26/23	36/33/29	44/42/37	57/51/45	65/60/54	77/70/63
- Starts per hour ³⁾	1/h	1.8	0.8	3.3	1.5	2	1

¹⁾ Measurement at 60 °C according to UL/CSA not required.

²⁾ With 300 % I_M .

³⁾ For intermittent duty S4 with ON period = 30 %, $T_0 = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

⁴⁾ Maximum adjustable rated motor current I_M , dependent on CLASS setting.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Type		3RW44 34	3RW44 35	3RW44 36
Power electronics		40 °C/50 °C/60 °C		
Load rating with rated operational current I_e				
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	113/100/88	134/117/100	162/145/125
Smallest adjustable rated motor current I_M For the motor overload protection		22	26	32
Power loss				
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	64	76	95
• During starting with 300 % I_M (40 °C)	W	1350	1700	2460
Permissible rated motor current and starts per hour				
• Normal starting (Class 5)				
- Rated motor current $I_M^{(2)}$, starting time 5 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	41	39	41
- Rated motor current $I_M^{(2)(4)}$, starting time 10 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	20	15	20
• Normal starting (Class 10)				
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	20	15	20
- Rated motor current $I_M^{(2)(4)}$, starting time 20 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	9	6	7
• Normal starting (Class 15)				
- Rated motor current $I_M^{(2)}$, starting time 15 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	13	9	12
- Rated motor current $I_M^{(2)(4)}$, starting time 30 s	A	113/100/88	134/117/100	162/145/125
- Starts per hour ³⁾	1/h	6	6	1
• Normal starting (Class 20)				
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	106/97/88	125/113/100	147/134/122
- Starts per hour ³⁾	1/h	9	9	10
- Rated motor current $I_M^{(2)(4)}$, starting time 30 s	A	106/97/88	125/113/100	147/134/122
- Starts per hour ³⁾	1/h	1.5	2	1
• For very heavy starting (Class 30)				
- Rated motor current $I_M^{(2)}$, starting time 30 s	A	91/84/76	110/100/90	120/110/100
- Starts per hour ³⁾	1/h	6	6	6
- Rated motor current $I_M^{(2)(4)}$, starting time 60 s	A	91/84/76	110/100/90	120/110/100
- Starts per hour ³⁾	1/h	2	2	2

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .

3) For intermittent duty S4 with ON period = 30 %, $T_u = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I_M , dependent on CLASS setting.

Type		3RW44 43	3RW44 44	3RW44 45	3RW44 46	3RW44 47
Power electronics		40 °C/50 °C/60 °C				
Load rating with rated operational current I_e						
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
Smallest adjustable rated motor current I_M For the motor overload protection		40	50	62	71	86
Power loss						
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	89	110	145	174	232
• During starting with 300 % I_M (40 °C)	W	3350	4000	4470	5350	5860
Permissible rated motor current and starts per hour						
• Normal starting (Class 5)						
- Rated motor current $I_M^{(2)}$, starting time 5 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	41	41	41	41	39
- Rated motor current $I_M^{(2/4)}$, starting time 10 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	20	20	19	17	16
• Normal starting (Class 10)						
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	20	20	19	17	16
- Rated motor current $I_M^{(2/4)}$, starting time 20 s	A	203/180/156	250/215/185	313/280/250	356/315/280	432/385/335
- Starts per hour ³⁾	1/h	9	10	6	4	5
• Normal starting (Class 15)						
- Rated motor current $I_M^{(2)}$, starting time 15 s	A	203/180/156	240/215/185	313/280/250	325/295/265	402/385/335
- Starts per hour ³⁾	1/h	13	13	10	13	11
- Rated motor current $I_M^{(2/4)}$, starting time 30 s	A	203/180/156	240/215/185	313/280/250	325/295/265	402/385/335
- Starts per hour ³⁾	1/h	3	6	1	2	1
• Normal starting (Class 20)						
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	195/175/155	215/195/180	275/243/221	285/263/240	356/326/295
- Starts per hour ³⁾	1/h	10	10	10	10	10
- Rated motor current $I_M^{(2/4)}$, starting time 30 s	A	195/175/155	215/195/180	275/243/221	285/263/240	356/326/295
- Starts per hour ³⁾	1/h	1	5	1	3	1
• For very heavy starting (Class 30)						
- Rated motor current $I_M^{(2)}$, starting time 30 s	A	162/148/134	180/165/150	220/201/182	240/223/202	285/260/235
- Starts per hour ³⁾	1/h	6	6	6	6	6
- Rated motor current $I_M^{(2/4)}$, starting time 60 s	A	162/148/134	180/165/150	220/201/182	240/223/202	285/260/235
- Starts per hour ³⁾	1/h	3	3	3	2	1

¹⁾ Measurement at 60 °C according to UL/CSA not required.

²⁾ With 300 % I_M .

³⁾ For intermittent duty S4 with ON period = 30 %, $T_u = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

⁴⁾ Maximum adjustable rated motor current I_M , dependent on CLASS setting.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Type		3RW44 53	3RW44 54	3RW44 55	3RW44 56	3RW44 57	3RW44 58
Power electronics		40 °C/50 °C/60 °C					
Load rating with rated operational current I_e							
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
Smallest adjustable rated motor current I_M For the motor overload protection		110	123	138	156	176	194
Power loss							
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	159	186	220	214	250	270
• During starting with 300 % I_M (40 °C)	W	7020	8100	9500	11100	13100	15000
Permissible rated motor current and starts per hour							
• Normal starting (Class 5)							
- Rated motor current $I_M^{(2)}$, starting time 5 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour ³⁾	1/h	41	41	37	33	22	17
- Rated motor current $I_M^{(2/4)}$, starting time 10 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour ³⁾	1/h	20	20	16	13	8	5
• Normal starting (Class 10)							
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour ³⁾	1/h	20	20	16	13	8	5
- Rated motor current $I_M^{(2/4)}$, starting time 20 s	A	551/494/438	615/551/489	693/615/551	780/693/615	880/780/693	970/850/760
- Starts per hour ³⁾	1/h	10	9	6	4	0.3	0.3
• Normal starting (Class 15)							
- Rated motor current $I_M^{(2)}$, starting time 15 s	A	551/494/438	615/551/489	666/615/551	723/693/615	780/710/650	821/755/693
- Starts per hour ³⁾	1/h	13	13	11	9	8	8
- Rated motor current $I_M^{(2/4)}$, starting time 30 s	A	551/494/438	615/551/489	666/615/551	723/693/615	780/710/650	821/755/693
- Starts per hour ³⁾	1/h	6	4	3	1	0.4	0.5
• Normal starting (Class 20)							
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	551/494/438	591/551/489	633/615/551	670/634/576	710/650/590	740/685/630
- Starts per hour ³⁾	1/h	10	10	7	8	7	9
- Rated motor current $I_M^{(2/4)}$, starting time 30 s	A	551/494/438	591/551/489	633/615/551	670/634/576	710/650/590	740/685/630
- Starts per hour ³⁾	1/h	4	2	1	1	0.4	1
• For very heavy starting (Class 30)							
- Rated motor current $I_M^{(2)}$, starting time 30 s	A	500/480/438	525/489/455	551/520/480	575/540/490	600/550/500	630/580/530
- Starts per hour ³⁾	1/h	6	6	6	6	6	6
- Rated motor current $I_M^{(2/4)}$, starting time 60 s	A	500/480/438	525/489/455	551/520/480	575/540/490	600/550/500	630/580/530
- Starts per hour ³⁾	1/h	2	1	1	1	1.5	1

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .

3) For intermittent duty S4 with ON period = 30 %, $T_u = 40$ °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I_M , dependent on CLASS setting.

Type		3RW44 65	3RW44 66
Power electronics		40 °C/50 °C/60 °C	
Load rating with rated operational current I_e			
• Acc. to IEC and UL/CSA ¹⁾ , for individual mounting at 40/50/60 °C, AC-53a	A	1076/970/880	1214/1076/970
Smallest adjustable rated motor current I_M For the motor overload protection		215	242
Power loss			
• In operation after completed starting with uninterrupted rated operational current (40 °C) approx.	W	510	630
• During starting with 300 % I_M (40 °C)	W	15000	17500
Permissible rated motor current and starts per hour			
• Normal starting (Class 5)			
- Rated motor current $I_M^{(2)}$, starting time 5 s	A	1076/970/880	1214/1076/970
- Starts per hour ³⁾	1/h	30	20
- Rated motor current $I_M^{(2)(4)}$, starting time 10 s	A	1076/970/880	1214/1076/970
- Starts per hour ³⁾	1/h	10	6
• Normal starting (Class 10)			
- Rated motor current $I_M^{(2)}$, starting time 10 s	A	1076/970/880	1214/1076/970
- Starts per hour ³⁾	1/h	11	6
- Rated motor current $I_M^{(2)(4)}$, starting time 20 s	A	1076/970/880	1214/1076/970
- Starts per hour ³⁾	1/h	3	0.5
• Normal starting (Class 15)			
- Rated motor current $I_M^{(2)}$, starting time 15 s	A	1020/950/850	1090/1000/920
- Starts per hour ³⁾	1/h	7	5
- Rated motor current $I_M^{(2)(4)}$, starting time 30 s	A	1020/950/850	1090/1000/920
- Starts per hour ³⁾	1/h	1	1
• Normal starting (Class 20)			
- Rated motor current $I_M^{(2)}$, starting time 20 s	A	970/880/810	1030/940/860
- Starts per hour ³⁾	1/h	7	5
- Rated motor current $I_M^{(2)(4)}$, starting time 30 s	A	970/880/810	1030/940/860
- Starts per hour ³⁾	1/h	1	1
• For very heavy starting (Class 30)			
- Rated motor current $I_M^{(2)}$, starting time 30 s	A	880/810/740	920/850/780
- Starts per hour ³⁾	1/h	6	6
- Rated motor current $I_M^{(2)(4)}$, starting time 60 s	A	880/810/740	920/850/780
- Starts per hour ³⁾	1/h	1	1

1) Measurement at 60 °C according to UL/CSA not required.

2) With 300 % I_M .

3) For intermittent duty S4 with ON period = 30 %, T_u = 40 °C, stand-alone installation vertical. The quoted switching frequencies do not apply for automatic mode.

4) Maximum adjustable rated motor current I_M , dependent on CLASS setting.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44

for high-feature applications



3RW44 27-1BC44

3RW44 36-6BC44

3RW44 47-6BC44

3RW44 58-6BC44

3RW44 66-6BC44

Ambient temperature 40 °C						Ambient temperature 50 °C					DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Rated operational current $I_e^{1)}$	Rated power of induction motors for rated operational voltage U_e					Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e										
	230 V	400 V	500 V	690 V	1000 V		200 V	230 V	460 V	575 V							
A	kW	kW	kW	kW	kW	A	hp	hp	hp	hp							kg

Inside-delta circuits, rated operational voltage 200 ... 460 V²⁾

50	15	22	--	--	--	45	10	15	30	--	▶	3RW44 22-□BC□4		1	1 unit	131	6.500
62	18.5	30	--	--	--	55	15	20	40	--	▶	3RW44 23-□BC□4		1	1 unit	131	6.500
81	22	45	--	--	--	73	20	25	50	--	▶	3RW44 24-□BC□4		1	1 unit	131	6.500
99	30	55	--	--	--	88	25	30	60	--	▶	3RW44 25-□BC□4		1	1 unit	131	6.500
133	37	75	--	--	--	118	30	40	75	--	▶	3RW44 26-□BC□4		1	1 unit	131	6.500
161	45	90	--	--	--	142	40	50	100	--	▶	3RW44 27-□BC□4		1	1 unit	131	6.500

Order No. supplement for connection types

- With spring-type terminals
- With screw terminals

196	55	110	--	--	--	173	50	60	125	--	B	3RW44 34-□BC□4		1	1 unit	131	7.900
232	75	132	--	--	--	203	60	75	150	--	B	3RW44 35-□BC□4		1	1 unit	131	7.900
281	90	160	--	--	--	251	75	100	200	--	B	3RW44 36-□BC□4		1	1 unit	131	7.900
352	110	200	--	--	--	312	100	125	250	--	B	3RW44 43-□BC□4		1	1 unit	131	11.500
433	132	250	--	--	--	372	125	150	300	--	B	3RW44 44-□BC□4		1	1 unit	131	11.500
542	160	315	--	--	--	485	150	200	400	--	B	3RW44 45-□BC□4		1	1 unit	131	11.500
617	200	355	--	--	--	546	150	200	450	--	B	3RW44 46-□BC□4		1	1 unit	131	11.500
748	250	400	--	--	--	667	200	250	600	--	B	3RW44 47-□BC□4		1	1 unit	131	11.500
954	315	560	--	--	--	856	300	350	750	--	C	3RW44 53-□BC□4		1	1 unit	131	50.000
1065	355	630	--	--	--	954	350	400	850	--	C	3RW44 54-□BC□4		1	1 unit	131	50.000
1200	400	710	--	--	--	1065	350	450	950	--	C	3RW44 55-□BC□4		1	1 unit	131	50.000
1351	450	800	--	--	--	1200	450	500	1050	--	C	3RW44 56-□BC□4		1	1 unit	131	50.000
1524	500	900	--	--	--	1351	450	600	1200	--	C	3RW44 57-□BC□4		1	1 unit	131	50.000
1680	560	1000	--	--	--	1472	550	650	1300	--	C	3RW44 58-□BC□4		1	1 unit	131	50.000
1864	630	1100	--	--	--	1680	650	750	1500	--	C	3RW44 65-□BC□4		1	1 unit	131	78.000
2103	710	1200	--	--	--	1864	700	850	1700	--	C	3RW44 66-□BC□4		1	1 unit	131	78.000

Order No. supplement for connection types

- With spring-type terminals
- With screw terminals

Order No. supplement for the rated control supply voltage $U_s^{3)}$

- 115 V AC
- 230 V AC

¹⁾ In the selection table, the unit rated current I_e refers to the induction motor's rated operational current in the inside-delta circuit. The actual current of the device is approx. 58 % of this value.

²⁾ 3RW44 2 ... 3RW44 4. soft starters with screw terminals: delivery times ▶ (preferred type),

³⁾ Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

Note:

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism $J_{Load} < 10 \times J_{Motor}$; starting current $350 \% \times I_e$ for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures $> 40 ^\circ\text{C}$ and switching frequency.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44
for high-feature applications

1
2
3
4
5
6
7

Ambient temperature 40 °C						Ambient temperature 50 °C					DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.	
Rated operational current I_e ¹⁾	Rated power of induction motors for rated operational voltage U_e					Rated operational current I_e	Rated power of induction motors for rated operational voltage U_e											
	230 V	400 V	500 V	690 V	1000 V		200 V	230 V	460 V	575 V								
A	kW	kW	kW	kW	kW	A	hp	hp	hp	hp							kg	
Inside-delta circuits, rated operational voltage 400 ... 600 V ²⁾																		
50	--	22	30	--	--	45	--	--	30	40	A	3RW44 22-□BC□5		1	1 unit	131	6.500	
62	--	30	37	--	--	55	--	--	40	50	A	3RW44 23-□BC□5		1	1 unit	131	6.500	
81	--	45	45	--	--	73	--	--	50	60	A	3RW44 24-□BC□5		1	1 unit	131	6.500	
99	--	55	55	--	--	88	--	--	60	75	A	3RW44 25-□BC□5		1	1 unit	131	6.500	
133	--	75	90	--	--	118	--	--	75	100	A	3RW44 26-□BC□5		1	1 unit	131	6.500	
161	--	90	110	--	--	142	--	--	100	125	A	3RW44 27-□BC□5		1	1 unit	131	6.500	
Order No. supplement for connection types																		
• With spring-type terminals																		
• With screw terminals																		
196	--	110	132	--	--	173	--	--	125	150	B	3RW44 34-□BC□5		1	1 unit	131	7.900	
232	--	132	160	--	--	203	--	--	150	200	B	3RW44 35-□BC□5		1	1 unit	131	7.900	
281	--	160	200	--	--	251	--	--	200	250	B	3RW44 36-□BC□5		1	1 unit	131	7.900	
352	--	200	250	--	--	312	--	--	250	300	B	3RW44 43-□BC□5		1	1 unit	131	11.500	
433	--	250	315	--	--	372	--	--	300	350	B	3RW44 44-□BC□5		1	1 unit	131	11.500	
542	--	315	355	--	--	485	--	--	400	500	B	3RW44 45-□BC□5		1	1 unit	131	11.500	
617	--	355	450	--	--	546	--	--	450	600	B	3RW44 46-□BC□5		1	1 unit	131	11.500	
748	--	400	500	--	--	667	--	--	600	750	B	3RW44 47-□BC□5		1	1 unit	131	11.500	
954	--	560	630	--	--	856	--	--	750	950	C	3RW44 53-□BC□5		1	1 unit	131	50.000	
1065	--	630	710	--	--	954	--	--	850	1050	C	3RW44 54-□BC□5		1	1 unit	131	50.000	
1200	--	710	800	--	--	1065	--	--	950	1200	C	3RW44 55-□BC□5		1	1 unit	131	50.000	
1351	--	800	900	--	--	1200	--	--	1050	1350	C	3RW44 56-□BC□5		1	1 unit	131	50.000	
1524	--	900	1000	--	--	1351	--	--	1200	1500	C	3RW44 57-□BC□5		1	1 unit	131	50.000	
1680	--	1000	1200	--	--	1472	--	--	1300	1650	C	3RW44 58-□BC□5		1	1 unit	131	50.000	
1864	--	1100	1350	--	--	1680	--	--	1500	1900	C	3RW44 65-□BC□5		1	1 unit	131	78.000	
2103	--	1200	1500	--	--	1864	--	--	1700	2100	C	3RW44 66-□BC□5		1	1 unit	131	78.000	

Order No. supplement for connection types

- With spring-type terminals
- With screw terminals

Order No. supplement for the rated control supply voltage U_s ³⁾

- 115 V AC
- 230 V AC

¹⁾ In the selection table, the unit rated current I_e refers to the induction motor's rated operational current in the inside-delta circuit. The actual current of the device is approx. 58 % of this value.

²⁾ Soft starter with screw terminals:
3RW44 2. ... 3RW44 4. Delivery time A
3RW44 5. ... 3RW44 6. Delivery time B.

³⁾ Control by way of the internal 24 V DC supply and direct control by means of PLC possible.

Note:

Soft starter selection depends on the rated motor current.

The 3RW44 solid-state soft starters are designed for normal starting (Class 10). (Inertia load of the overall operating mechanism $J_{Load} < 10 \times J_{Motor}$; starting current $350 \% \times I_e$ for 20 s similar load). For any other conditions of use, the devices should be selected using the Win-Soft Starter selection and simulation program. See Technical specifications for information about rated currents for ambient temperatures $> 40 ^\circ\text{C}$ and switching frequency.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Technical specifications

Type	Terminal		3RW44 ...BC3.	3RW44 ...BC4.
Control electronics				
Rated values				
Rated control supply voltage	A1/A2/PE	V	115 AC	230 AC
• Tolerance		%	-15/+10	-15/+10
Rated control supply current STANDBY		mA	30	20
Rated control supply current ON				
• 3RW44 2.		mA	300	170
• 3RW44 3.		mA	500	250
• 3RW44 4.		mA	750	400
• 3RW44 5.		mA	450	200
• 3RW44 6.		mA	650	300
Maximum current (pickup bypass)				
• 3RW44 2.		mA	1000	500
• 3RW44 3.		mA	2500	1250
• 3RW44 4.		mA	6000	3000
• 3RW44 5.		mA	4500	2500
• 3RW44 6.		mA	4500	2500
Rated frequency		Hz	50 ... 60	50 ... 60
• Tolerance		%	±10	±10
Type	Terminal		3RW44 ..	Factory default
Control electronics				
Control inputs				
Input 1	IN1			Start motor right parameter set 1
Input 2	IN2			No action
Input 3	IN3			No action
Input 4	IN4			Trip reset
Supply	L+/L-			
• Rated operational current	L+	mA	Approx. 10 per input to DIN 19240	
• Rated operational voltage	L+		Internal voltage: 24 V DC from internal supply through terminal L+ to IN1 ... IN4. Maximum load at L+ approx. 55 mA	
	L-		External voltage: DC external voltage (acc. to DIN 19240) through terminals L- and IN1 ... IN4 (min. 12 V DC, max. 30 V DC)	
Thermistor motor protection input				
Input	T1/T2		PTC type A or Thermoclick	Deactivated
Relay outputs (floating auxiliary contacts)				
Output 1	13/14			ON period
Output 2	23/24			No action
Output 3	33/34			No action
Output 4	95/96/98			Group fault
Switching capacity of the relay outputs (auxiliary contacts)				
230 V/AC-15		A	3 at 240 V	
24 V/DC-13		A	1 at 24 V	
Protection against overvoltages			Protection by means of varistor through relay contact	
Short-circuit protection			4 A gL/gG operational class; 6 A quick (fuse is not included in scope of supply)	
Protection functions				
Motor protection functions				
Trips in the event of			Thermal overloading of the motor	
Trip class acc. to IEC 60947-4-1		Class	5/10/15/20/30	10
Phase failure sensitivity		%	>40	
Overload warning			Yes	
Reset and recovery			Manual/Automatic	Manual
Reset option after tripping			Manual/Automatic	Manual
Recovery time		min.	1 ... 30	1
Device protection functions				
Trips in the event of			Thermal overloading of the thyristors	
Reset option after tripping			Manual/Automatic	Manual
Recovery time		min.	0.5	
Bypass protection functions				
Trips in the event of			Thermal overloading of the bypass contacts	
Reset option after tripping			Manual	
Recovery time		min.	1	

Type	3RW44..	Factory default
Control times and parameters		
Control times		
Closing time (with connected control voltage)	ms	<50
Closing time (automatic mode)	ms	<4000
Recovery time (closing command in active ramp-down)	ms	<100
Mains failure bridging time		
Control supply voltage	ms	100
Mains failure response time		
Load circuit	ms	100
Reclosing lockout after overload trip		
Motor protection trip	min.	1 ... 30
Device protection trip	s	30
Setting options for starting		
Voltage ramp for starting voltage	%	20 ... 100
Torque control for starting torque	%	10 ... 100
Torque control for limit torque	%	20 ... 200
Starting time	s	0 ... 360 ³⁾
Maximum starting time	s	1 ... 1000
Current limit value	%	125 ... 550 ¹⁾
Breakaway voltage	%	40 ... 100
Breakaway time	s	0 ... 2
Motor heat output	%	1 ... 100
Creep mode Left/Right running		
Speed factor as function of rated speed ($n = n_{\text{rated}}/\text{factor}$)	%	3 ... 21
Creep torque ²⁾	%	20 ... 100
Setting options for ramp-down		
Torque control for stopping torque	%	10 ... 100
Ramp-down time	s	0 ... 360 ³⁾
Dynamic braking torque	%	20 ... 100
DC braking torque	%	20 ... 100
Operating indications		
Test voltage Test mains phases Ready to start Start active Motor running Ramp-down active Emergency start active		
Warnings/error signals		
Mains voltage missing Leading-edge phase error Phase failure <ul style="list-style-type: none"> • L1 • L2 • L3 Missing load phase <ul style="list-style-type: none"> • T1 • T2 • T3 Failure <ul style="list-style-type: none"> • Contact element 1 (thyristor) • Contact element 2 (thyristor) • Contact element 3 (thyristor) Flash memory faulty Supply voltage <ul style="list-style-type: none"> • Below 75 % • Below 85 % • Over 110 % Current unbalance exceeded Thermal motor model overload Prewarning limit exceeded <ul style="list-style-type: none"> • Motor heating • Time-related trip reserve Bypass element defective Mains voltage too high Device not named Wrong naming version Current measuring range exceeded Bypass element protection disconnection Power section <ul style="list-style-type: none"> • Overheated • Overheating 		

¹⁾ Max. current limit value for 3RW44 53 ... 3RW44 57: 500 % and for 3RW44 58 ... 3RW44 66: 450 %.

²⁾ Reference variable depends on the motor used but is always smaller than the rated torque of the motor.

³⁾ Actual motor start times are load dependent.






For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Type	3RW44 ..	Factory default
Control times and parameters		
Warnings/error signals (continued)	<ul style="list-style-type: none"> Temperature sensor <ul style="list-style-type: none"> • Overload • Open circuit • Short-circuit Ground fault <ul style="list-style-type: none"> • Detected Connection abort in manual operating mode Max. number of starts exceeded I_e limit value overshoot/undershoot Heat sink sensor <ul style="list-style-type: none"> • Open circuit • Short-circuit Quick-stop active Switching block defective I_g/class setting not permissible No external start-up parameters received PAA fault 	
Control inputs Input 1 Input 2 Input 3 Input 4 Parameterizing options for control inputs 1 ... 4	<ul style="list-style-type: none"> No action Local manual mode Emergency start Creep speed Quick-stop Trip reset Motor right parameter set 1 Motor left parameter set 1¹⁾ Motor right parameter set 2 Motor left parameter set 2¹⁾ Motor right parameter set 3 Motor left parameter set 3¹⁾ 	
Relay outputs Output 1 Output 2 Output 3 Output 4 Parameterizing options for relay outputs 1 ... 3	<ul style="list-style-type: none"> ON period No action No action Group fault No action PAA output 1 PAA output 2 Input 1 Input 2 Input 3 Input 4 Starting Operation/Bypass Ramp-down ON period Command motor on DC braking contactor Group warning Group fault Bus fault Device fault Power on Ready to start 	
Motor temperature sensor	<ul style="list-style-type: none"> Deactivated Thermoclick PTC type A 	

¹⁾ Parameter motor left possible only in conjunction with creep mode.

Type			3RW44 2.	3RW44 3.	3RW44 4.	3RW44 5. 3RW44 6.
Conductor cross-sections						
Screw terminals	Main conductors					
With box terminal						
Front clamping point connected						
	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Solid Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm ² mm AWG	2.5 ... 35 4 ... 50 2.5 ... 16 4 ... 70 6 x 9 x 0.8 10 ... 2/0	3RT19 55-4G (55 kW) 16 ... 70 16 ... 70 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	3RT19 66-4G 70 ... 240 70 ... 240 95 ... 300 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 3/0 ... 600 kcmil	-- -- -- -- -- --
Rear clamping point connected						
	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Solid Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm ² mm AWG	2.5 ... 50 10 ... 50 2.5 ... 16 10 ... 70 6 x 9 x 0.8 10 ... 2/0	16 ... 70 16 ... 70 -- 16 ... 70 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 2/0	120 ... 185 120 ... 185 -- 120 ... 240 Min. 6 x 9 x 0.8 Max. 20 x 24 x 0.5 250 ... 500 kcmil	-- -- -- -- -- --
Both clamping points connected						
	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Solid Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded Terminal screws - Tightening torque 	mm ² mm ² mm ² mm ² mm AWG NM lb.in	2 x (2.5 ... 35) 2 x (4 ... 35) 2 x (2.5 ... 16) 2 x (4 ... 50) 2 x (6 x 9 x 0.8) 2 x (10 ... 1/0) M6 (hexagon socket, A/F4) 4 ... 6 36 ... 53	Max. 1 x 50, 1 x 70 Max. 1 x 50, 1 x 70 -- Max. 2 x 70 Max. 2 x (6 x 15.5 x 0.8) Max. 2 x 1/0 M10 (hexagon socket, A/F4) 10 ... 12 90 ... 110	Min. 2 x 50 Max. 2 x 185 Min. 2 x 50 Max. 2 x 185 Max. 2 x 70 Max. 2 x 240 Max. 2 x (20 x 24 x 0.5) Min. 2 x 2/0 Max. 2 x 500 kcmil M12 (hexagon socket, A/F5) 20 ... 22 180 ... 195	-- -- -- -- -- -- -- -- --
Screw terminals	Main conductors					
With box terminal						
Front or rear clamping point connected						
	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm AWG	-- -- -- -- --	3RT19 56-4G 16 ... 120 16 ... 120 16 ... 120 Min. 3 x 9 x 0.8 Max. 6 x 15.5 x 0.8 6 ... 250 kcmil	-- -- -- -- -- --	-- -- -- -- -- --
Both clamping points connected						
	<ul style="list-style-type: none"> Finely stranded with end sleeve Finely stranded without end sleeve Stranded Ribbon cable conductors (number x width x thickness) AWG cables, solid or stranded 	mm ² mm ² mm ² mm AWG	-- -- -- -- --	Max. 1 x 95, 1 x 120 Max. 1 x 95, 1 x 120 Max. 2 x 120 Max. 2 x (10 x 15.5 x 0.8) Max. 2 x 3/0	-- -- -- -- --	-- -- -- -- --
Screw terminals	Main conductors					
	<u>Without box terminal/busbar connection</u>					
	<ul style="list-style-type: none"> Finely stranded with cable lug Stranded with cable lug AWG cables, solid or stranded Connecting bar (max. width) Terminal screws - Tightening torque 	mm ² mm ² AWG mm NM lb.in	-- -- -- -- -- --	16 ... 95 ¹⁾ 25 ... 120 ¹⁾ 4 ... 250 kcmil 17 M8 x 25 (A/F13) 10 ... 14 89 ... 124	50 ... 240 ²⁾ 70 ... 240 ²⁾ 2/0 ... 500 kcmil 25 M10 x 30 (A/F17) 14 ... 24 124 ... 210	50 ... 240 ²⁾ 70 ... 240 ²⁾ 2/0 ... 500 kcmil 60 M12 x 40 20 ... 35 177 ... 310

¹⁾ When connecting cable lugs to DIN 46235, use 3RT19 56-4EA1 terminal cover for conductor cross-sections from 95 mm² to ensure phase spacing.

²⁾ When connecting cable lugs to DIN 46234, the 3RT19 66-4EA1 terminal cover must be used for conductor cross-sections of 240 mm² and more as well as DIN 46235 for conductor cross-sections of 185 mm² and more to keep the phase clearance.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44
for high-feature applications

Soft starters	Type	3RW44..
Conductor cross-sections		
Auxiliary conductors (1 or 2 conductors can be connected):		
Screw terminals		
• Solid	mm ²	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5)
• AWG cables		
- Solid or stranded	AWG	2 x (20 ... 14)
- Finely stranded with end sleeve	AWG	2 x (20 ... 16)
• Terminal screws	NM	0.8 ... 1.2
- Tightening torque	lb.in	7 ... 10.3
Spring-type terminals		
• Solid	mm ²	2 x (0.25 ... 1.5)
• Finely stranded with end sleeve	mm ²	2 x (0.25 ... 1.5)
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)
		Standard Parameters
Electromagnetic compatibility acc. to EN 60947-4-2		
EMC interference immunity		
Electrostatic discharge (ESD)	EN 61000-4-2	±4 kV contact discharge, ±8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Frequency range: 80 ... 1000 MHz with 80 % at 1 kHz Degree of severity 3, 10 V/m
Conducted RF interference	EN 61000-4-6	Frequency range: 150 kHz ... 80 MHz with 80 % at 1 kHz Interference 10 V
RF voltages and RF currents on cables		
• Burst	EN 61000-4-4	±2 kV/5 kHz
• Surge	EN 61000-4-5	±1 kV line to line ±2 kV line to ground
EMC interference emission		
EMC interference field strength	EN 55011	Limit value of Class A at 30 ... 1000 MHz
Radio interference voltage	EN 55011	Limit value of Class A at 0.15 ... 30 MHz
Is an RI suppression filter necessary?		
Degree of noise suppression A (industrial applications)	No	

Circuit Breaker SCCR

Soft starters <div>TOC 1</div>		Circuit Brakers												Fuse					
		Thermal Magnetic			Instantaneous Trip														
Q11 Type	Rated current	480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	480 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A	600 V Type	SCCR kA	Max. size A
3RW44 22	11	ED63B, HEG3G	100	40				ED63A, HEM3M	100	40	ED63A, HEM3M	50	40	RK5	100	50	J	100	100
3RW44 23	23	ED63B, HEG3G	100	50				ED63A, HEM3M	100	50	ED63A, HEM3M	50	50	RK5	100	60	J	100	120
3RW44 24	29	ED63B, HEG3G	100	70				ED63A, HEM3M	100	100	ED63A, HEM3M	50	50	RK5	100	80	J	100	160
3RW44 25	29	ED63B, HEG3G	100	70				ED63A, HEM3M	100	50	ED63A, HEM3M	50	50	RK5	100	80			
3RW44 26	29	ED63B, HEG3G	100	100				ED63A, HEM3M	100	100	ED63A, HEM3M	50	100	RK5	100	125	J	100	250
3RW44 27	34	ED63B, FD63B	100	150				ED63A, HEM3M	100	100	ED63A, HEM3M	50	125	RK5	100	150	J	100	300
3RW44 34	42	FD63B	100	150	FD63B	50	150	ED63A, HEM3M	100	125	FXD63A	50	150	RK5	100	200	J	100	400
3RW44 35	58	FD63B	100	150	FD63B	50	150	FXD63A	100	150	FXD63A	50	150	RK5	100	200	J	100	400
3RW44 36	62	JD63B	100	200	JD63B	50	250	FXD63A	100	250	FXD63A	50	250	RK5	100	250	J	100	500
3RW44 43	73	JD63B	100	300	JD63B	50	250	FXD63A	100	250	JXD63A	50	300	RK5	100	300	J	100	600
3RW44 44	98	JD63B	100	300	JD63B	50	300	JXD63A	100	300	JXD63A	50	300	RK5	100	350			
3RW44 45	98	JD63B	100	400	JD63B	50	400	JXD63A	100	400	JXD63A	50	400	RK5	100	450			
3RW44 46	98	LD63B	100	500	LD63B	50	450	LXD63H	100	400	JXD63A	50	400	RK5	100	600			
3RW44 47	98	LD63B	100	600	LD63B	50	600	LXD63H	100	600	LXD63H	50	600	L	100	700			
3RW44 53	117	HMD6	65	800/ 800	HMD6	50	800/ 800							L	100	1000			
3RW44 54	145	HND6	100	1200/ 900	HND6	50	1200/ 900							L	100	1000			
3RW44 55	145	HND6	100	1200/ 900	HND6	50	1200/ 900							L	100	1000			
3RW44 56	145	HND6	100	1200/ 1000	HND6	50	1200/ 1000							L	100	1000			
3RW44 57	145	HND6	100	1200/ 1000	HND6	50	1200/ 1000							L	100	1000			
3RW44 58	145	CND6	65	1200	CND6	65	1200												
3RW44 65	205	CND6	42	1600	CND6	42	1600												
3RW44 66	248	CND6	42	1600	CND6	42	1600												

Specified Type

ED63A
FXD63A
JXD63A
ED63B
FD63B
JD63B
HND6

Others permitted

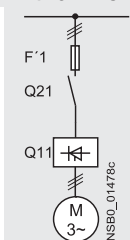
HED63A, HHED63A or CED63A
HFXD63A or CFD63A
HJXD63A or CJD63A
HED63B, HHED63B or CED63B
HFD63B, HHFD63B or CFD63B
HJ63B, HHJD63B or CJD63B
HNXD6 or CND6

For Operation in the Control Cabinet

3RW Soft Starters

3RW44
for high-feature applications

Inline circuit fused version with 3NE1 SITOR all-range fuse (semiconductor and line protection)



For matching fuse bases see Catalog LV 1 under "SETRON Switching and Protection Devices for Power Distribution" —> "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" —> "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor —> "Products" —> "BETA Protecting" —> "SITOR"

Soft starters		All-range fuses				Line contactors up to 400 V (optional)	Braking contactors ¹⁾²⁾ (for example circuit see page 7/70)	
Q11 Type	Rated current A	F'1 Type	Rated current A	Voltage V	Size	Q21 Type	Q91 Type	Q92 Type
Type of coordination "2" ³⁾ ; $I_q = 65 \text{ kA}$								
3RW44 22	29	3NE1 020-2	80	690 +5 %	00	3RT10 34	3RT15 26	--
3RW44 23	36	3NE1 020-2	80	690 +5 %	00	3RT10 35	3RT15 26	--
3RW44 24	47	3NE1 021-2	100	690 +5 %	00	3RT10 36	3RT15 35	--
3RW44 25	57	3NE1 022-2	125	690 +5 %	00	3RT10 44	3RT15 35	--
3RW44 26	77	3NE1 022-2	125	690 +5 %	00	3RT10 45	3RT10 24	3RT10 35
3RW44 27	93	3NE1 024-2	160	690 +5 %	1	3RT10 46	3RT10 25	3RT10 36
3RW44 34	113	3NE1 225-2	200	690 +5 %	1	3RT10 54	3RT10 34	3RT10 44
3RW44 35	134	3NE1 227-2	250	690 +5 %	1	3RT10 55	3RT10 36	3RT10 45
3RW44 36	162	3NE1 227-2	250	690 +5 %	1	3RT10 56	3RT10 44	3RT10 45
3RW44 43	203	3NE1 230-2	315	600 +10 %	1	3RT10 64	3RT10 44	3RT10 54
3RW44 44	250	3NE1 331-2	350	460 +10 %	2	3RT10 65	3RT10 44	3RT10 55
3RW44 45	313	3NE1 333-2	450	690 +5 %	2	3RT10 75	3RT10 54	3RT10 56
3RW44 46	356	3NE1 334-2	500	690 +5 %	2	3RT10 75	3RT10 54	3RT10 56
3RW44 47	432	3NE1 435-2	560	690 +5 %	3	3RT10 76	3RT10 55	3RT10 64
3RW44 53	551	2 x 3NE1 334-2	500	690 +10 %	2	3TF68	3RT10 64	3RT10 66
3RW44 54	615	2 x 3NE1 334-2	500	690 +10 %	2	3TF68	3RT10 64	3RT10 75
3RW44 55	693	2 x 3NE1 334-2	500	690 +10 %	2	3TF69	3RT10 65	3RT10 75
3RW44 56	780	2 x 3NE1 435-2	560	690 +10 %	3	3TF69	3RT10 65	3RT10 75
3RW44 57	880	2 x 3NE1 435-2	560	690 +10 %	3		3RT10 75	3RT10 76
3RW44 58	970	2 x 3NE1 435-2	560	690 +10 %	3		3RT10 75	3RT10 76
3RW44 65	1076	3 x 3NE1 334-2	500	690 +10 %	2		3RT10 75	3TF68
3RW44 66	1214	3 x 3NE1 435-2	560	690 +10 %	3		3RT10 76	3TF68

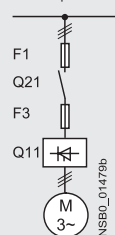
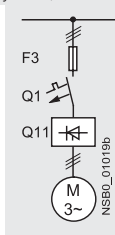
¹⁾ If the ramp-down function "Combined braking" is selected, no braking contactor is required.
If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (see table for type).
For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) we recommend the function "DC braking".

²⁾ Additional auxiliary relay K4:
LZX:RT4A4T30
(3RW44 soft starter with rated control supply voltage 230 V AC),
LZX:RT4A4S15
(3RW44 soft starter with rated control supply voltage 115 V AC).

³⁾ The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.
The types of coordination are explained under "3RA1 Fuseless Load Feeders".

Inline circuit fused version with 3NE or 3NC SITOR semiconductor fuse

(semiconductor protection by fuse, line and overload protection by motor starter protector/circuit breaker)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" —> "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" —> "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor —> "Products" —> "BETA Protecting" —> "SITOR"

Soft starters <div>Top 2</div>	Rated current	Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
		690 V +10 % F3 Type	Rated current	Size	690 V +10 % F3 Type	Rated current	Size	F3 Type	Rated current	Size
Q11 Type	A	F3 Type	A		F3 Type	A		F3 Type	A	
Type of coordination "2" ³⁾ : I _q = 65 kA										
3RW44 22	29	3NE4 120	80	0	3NE4 121	100	0	3NC2 280	80	22 x 58
3RW44 23	36	3NE4 121	100	0	3NE4 121	100	0	3NC2 200	100	22 x 58
3RW44 24	47	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 25	57	3NE4 122	125	0	3NE4 124	160	0			
3RW44 26	77	3NE4 124	160	0	3NE4 124	160	0			
3RW44 27	93	3NE3 224	160	1	3NE3 332-0B	400	2			
3RW44 34	113	3NE3 225	200	1	3NE3 335	560	2			
3RW44 35	134	3NE3 225	200	1	3NE3 335	560	2			
3RW44 36	162	3NE3 227	250	1	3NE3 333	450	2			
3RW44 43	203	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 44	250	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 45	313	3NE3 233	450	1	3NE3 336	630	2			
3RW44 46	356	3NE3 333	450	2	3NE3 336	630	2			
3RW44 47	432	3NE3 335	560	2	3NE3 338-8	800	2			
3RW44 53	551	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 54	615	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 55	693	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 56	780	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 57	880	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 58	970	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 65	1076	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			
3RW44 66	1214	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			

Soft starters		Line contactors up to 400 V	Braking contactors ¹⁾²⁾		Motor starter protectors/ circuit breakers		Line protection, maximum		
<div>TOC 2</div>	Rated current	(optional)	(for example circuit see page 7/64)		440 V +10 %	Rated current	690 V +5 %	Rated current	Size
Q11 Type	A	Q21 Type	Q91 Type	Q92 Type	Q1 Type	A	F1 Type	A	
Type of coordination "2" ³⁾ : I _q = 65 kA									
3RW44 22	29	3RT10 34	3RT15 26	--	3RV10 41-4HA10	50	3NA3 820-6	50	00
3RW44 23	36	3RT10 35	3RT15 26	--	3RV10 41-4JA10	63	3NA3 822-6	63	00
3RW44 24	47	3RT10 36	3RT15 35	--	3RV10 41-4KA10	75	3NA3 824-6	80	00
3RW44 25	57	3RT10 44	3RT15 35	--	3RV10 41-4LA10	90	3NA3 830-6	100	00
3RW44 26	77	3RT10 45	3RT10 24	3RT10 35	3RV10 41-4MA10	100	3NA3 132-6	125	1
3RW44 27	93	3RT10 46	3RT10 25	3RT10 36	3RV10 41-4MA10	100	3NA3 136-6	160	1
3RW44 34	113	3RT10 54	3RT10 34	3RT10 44	3VL17 16	160	3NA3 244-6	250	2
3RW44 35	134	3RT10 55	3RT10 36	3RT10 45	3VL17 16	160	3NA3 244-6	250	2
3RW44 36	162	3RT10 56	3RT10 44	3RT10 45	3VL37 25	250	3NA3 365-6	500	3
3RW44 43	203	3RT10 64	3RT10 44	3RT10 54	3VL47 31	315	2 x 3NA3 354-6	2 x 355	3
3RW44 44	250	3RT10 65	3RT10 44	3RT10 55	3VL47 31	315	2 x 3NA3 354-6	2 x 355	3
3RW44 45	313	3RT10 75	3RT10 54	3RT10 56	3VL47 40	400	2 x 3NA3 365-6	2 x 500	3
3RW44 46	356	3RT10 75	3RT10 54	3RT10 56	3VL47 40	400	2 x 3NA3 365-6	2 x 500	3
3RW44 47	432	3RT10 76	3RT10 55	3RT10 64	3VL57 50	500	2 x 3NA3 365-6	2 x 500	3
3RW44 53	551	3TF68	3RT10 64	3RT10 66	3VL67 80	800	2 x 3NA3 365-6	2 x 500	3
3RW44 54	615	3TF68	3RT10 64	3RT10 75	3VL67 80	800	2 x 3NA3 365-6	2 x 500	3
3RW44 55	693	3TF69	3RT10 65	3RT10 75	3VL67 80	800	2 x 3NA3 365-6	2 x 500	3
3RW44 56	780	3TF69	3RT10 65	3RT10 75	3VL77 10	1000	2 x 3NA3 365-6	2 x 500	3
3RW44 57	880		3RT10 75	3RT10 76	3VL77 10	1000	2 x 3NA3 365-6	2 x 500	3
3RW44 58	970		3RT10 75	3RT10 76	3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3
3RW44 65	1076		3RT10 75	3TF68	3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3
3RW44 66	1214		3RT10 76	3TF68	3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3

¹⁾ If the ramp-down function "Combined braking" is selected, no braking contactor is required. If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition (see table for type). For applications with large centrifugal masses ($J_{\text{Load}} > J_{\text{Motor}}$) we recommend the function "DC braking".

²⁾ Additional auxiliary relay K4:

LZX:RT4A4T30
(3RW44 soft starter with rated control supply voltage 230 V AC),
LZX:RT4A4S15
(3RW44 soft starter with rated control supply voltage 115 V AC).

³⁾ The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder. The types of coordination are explained under "3RA1 Fuseless Load Feeders".

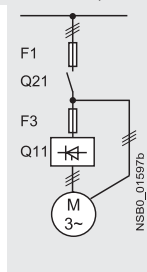
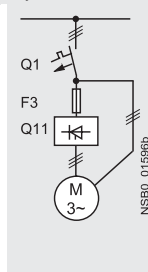
For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

Inside-delta circuit fused version with 3NE or 3NC SITOR fuses

(semiconductor protection by fuse, lead and overload protection by motor starter protector/circuit breaker)



For matching fuse bases see Catalog LV 1 under "SENTRON Switching and Protection Devices for Power Distribution" —> "Switch Disconnectors", and Catalog ET B1 under "BETA Protecting" —> "SITOR Semiconductor Fuses" or go to www.siemens.com/sitor —> "Products" —> "BETA Protecting" —> "SITOR"

Soft starters <div>ToC 2</div>	Rated current	Semiconductor fuses, minimum			Semiconductor fuses, maximum			Semiconductor fuses (cylinder)		
		690 V +10 %	Rated current	Size	690 V +10 %	Rated current	Size		Rated current	Size
Q11 Type	A	F3 Type	A		F3 Type	A		F3 Type	A	
Type of coordination "2" ¹⁾										
3RW44 22	50	3NE4 120	80	0	3NE4 121	100	0	3NC2 280	80	22 x 58
3RW44 23	62	3NE4 121	100	0	3NE4 121	100	0	3NC2 200	100	22 x 58
3RW44 24	81	3NE4 121	100	0	3NE4 122	125	0	3NC2 200	100	22 x 58
3RW44 25	99	3NE4 122	125	0	3NE4 124	160	0			
3RW44 26	133	3NE4 124	160	0	3NE4 124	160	0			
3RW44 27	161	3NE3 224	160	1	3NE3 332-0B	400	2			
3RW44 34	196	3NE3 225	200	1	3NE3 335	560	2			
3RW44 35	232	3NE3 225	200	1	3NE3 335	560	2			
3RW44 36	281	3NE3 227	250	1	3NE3 333	450	2			
3RW44 43	352	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 44	433	3NE3 230-0B	315	1	3NE3 333	450	2			
3RW44 45	542	3NE3 233	450	1	3NE3 336	630	2			
3RW44 46	617	3NE3 333	450	2	3NE3 336	630	2			
3RW44 47	748	3NE3 335	560	2	3NE3 338-8	800	2			
3RW44 53	954	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 54	1065	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 55	1200	2 x 3NE3 335	560	2	3 x 3NE3 334-0B	500	2			
3RW44 56	1351	2 x 3NE3 336	630	2	2 x 3NE3 340-8	900	2			
3RW44 57	1524	2 x 3NE3 336	630	2	3 x 3NE3 340-8	900	2			
3RW44 58	1680	2 x 3NE3 336	630	2	3 x 3NE3 340-8	900	2			
3RW44 65	1864	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			
3RW44 66	2103	2 x 3NE3 340-8	900	2	3 x 3NE3 338-8	800	2			

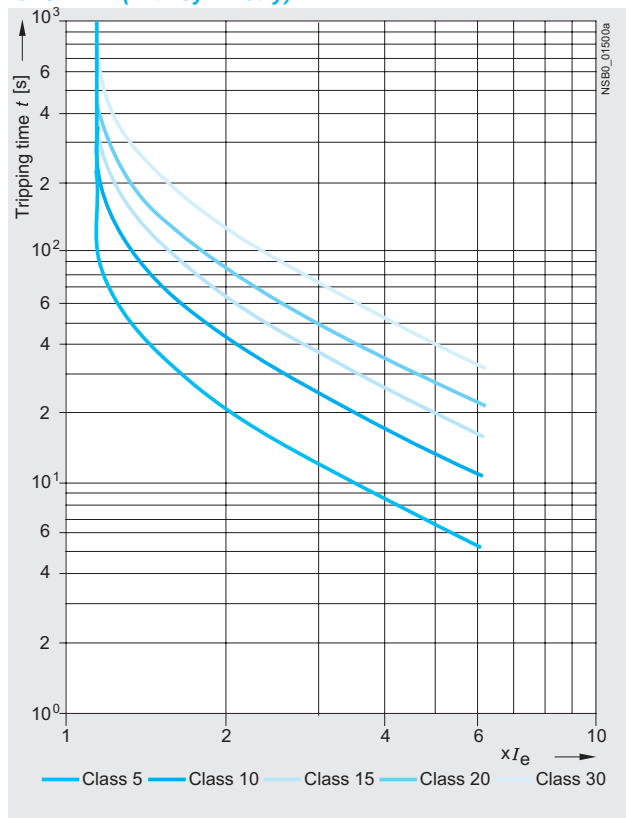
Soft starters <div>ToC 2</div>		Line contactors up to 400 V	Motor starter protectors/ circuit breakers		Line protection, maximum		
	Rated current	(optional)	440 V +10 %	Rated current	690 V +5 %	Rated current	Size
	Q11 Type	Q21 Type	Q1 Type	A	F1 Type	A	
Type of coordination "2" ¹⁾							
3RW44 22	50	3RT10 36-1AP04	3RV10 42-4KA10	75	3NA3 824-6	80	00
3RW44 23	62	3RT10 44-1AP04	3RV10 42-4LA10	90	3NA3 830-6	100	00
3RW44 24	81	3RT10 46-1AP04	3RV10 42-4MA10	100	3NA3 132-6	125	1
3RW44 25	99	3RT10 54-1AP36	3VL27 16	160	3NA3 136-6	160	1
3RW44 26	133	3RT10 55-6AP36	3VL27 16	160	3NA3 240-6	200	2
3RW44 27	161	3RT10 56-6AP36	3VL37 20	200	3NA3 244-6	250	2
3RW44 34	196	3RT10 64-6AP36	3VL37 25	250	3NA3 360-6	400	3
3RW44 35	232	3RT10 65-6AP36	3VL47 31	315	3NA3 360-6	400	3
3RW44 36	281	3RT10 66-6AP36	3VL47 40	400	2 x 3NA3 360-6	2 x 400	3
3RW44 43	352	3RT10 75-6AP36	3VL47 40	400	2 x 3NA3 365-6	2 x 500	3
3RW44 44	433	3RT10 76-6AP36	3VL57 50	500	2 x 3NA3 365-6	2 x 500	3
3RW44 45	542	3TF68 44-OCM7	3VL57 63	800	3 x 3NA3 365-6	3 x 500	3
3RW44 46	617	3TF68 44-OCM7	3VL67 80	800	3 x 3NA3 365-6	3 x 500	3
3RW44 47	748	3TF69	3VL67 80	800	3 x 3NA3 365-6	3 x 500	3
3RW44 53	954		3VL77 10	1000	3 x 3NA3 365-6	3 x 500	3
3RW44 54	1065		3VL77 12	1250	3 x 3NA3 365-6	3 x 500	3
3RW44 55	1200		3VL87 16	1600	3 x 3NA3 365-6	3 x 500	3
3RW44 56	1351		3VL87 16	1600	3 x 3NA3 372	3 x 630	3
3RW44 57	1524		3VL87 16	1600	3 x 3NA3 372	3 x 630	3
3RW44 58	1680		3WL12 20	2000	2 x 3NA3 480	2 x 1000	4
3RW44 65	1864		3WL12 25	2500	2 x 3NA3 482	2 x 1250	4
3RW44 66	2103		3WL12 25	2500	2 x 3NA3 482	2 x 1250	4

¹⁾ The type of coordination "2" refers only to soft starters in combination with the stipulated protective device (motor starter protector/circuit breaker/fuse), not to any additional components in the feeder.

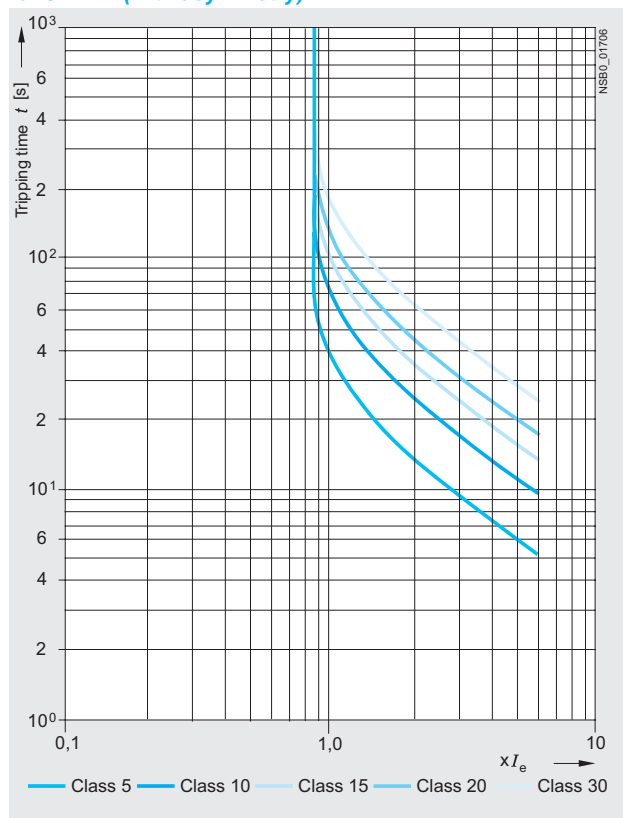
The types of coordination are explained under "3RA1 Fuseless Load Feeders".

Characteristic curves

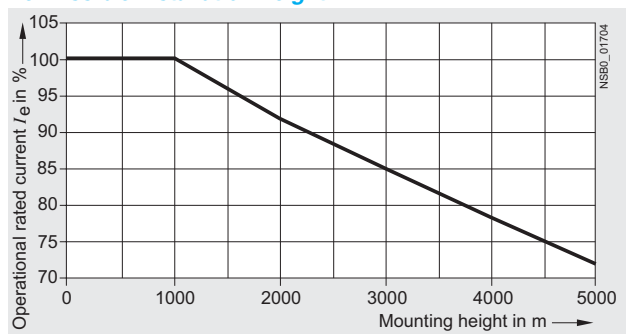
Motor protection tripping characteristics
for 3RW44 (with symmetry)



Motor protection tripping characteristics
for 3RW44 (with asymmetry)



Permissible installation height



At an installation height above 2000 m, the max. permissible operational voltage is reduced to 460 V.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44 for high-feature applications

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 350 % $I_{n \text{ motor}}$).

The soft starter rating can be selected to be as high as the rating of the motor used

Application	Conveyor belt	Roller conveyor	Compressor	Small fan	Pump	Hydraulic pump
Starting parameters						
• Voltage ramp and current limiting						
- Starting voltage %	70	60	50	30	30	30
- Starting time s	10	10	10	10	10	10
- Current limit value	Deactivated	Deactivated	$4 \times I_M$	$4 \times I_M$	Deactivated	Deactivated
• Torque ramp						
- Starting torque	60	50	40	20	10	10
- End torque	150	150	150	150	150	150
- Starting time	10	10	10	10	10	10
• Breakaway pulse	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
Ramp-down mode	Smooth ramp-down	Smooth ramp-down	Free ramp-down	Free ramp-down	Pump ramp-down	Free ramp-down

Application examples for heavy starting (Class 20)

Heavy starting Class 20 (up to 40 s with 350 % $I_{n \text{ motor}}$).

The soft starter has to be selected one performance class higher than the motor used

Application	Stirrer	Centrifuge	Milling machine
Starting parameters			
• Voltage ramp and current limiting			
- Starting voltage %	30	30	30
- Starting time s	30	30	30
- Current limit value	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
• Torque ramp			
- Starting torque	30	30	30
- End torque	150	150	150
- Starting time	30	30	30
• Breakaway pulse	Deactivated (0 ms)	Deactivated (0 ms)	Deactivated (0 ms)
Ramp-down mode	Free ramp-down	Free ramp-down	Free ramp-down or DC braking

Application examples for very heavy starting (Class 30)

Very heavy starting Class 30 (up to 60 s with 350 % $I_{n \text{ motor}}$).

The soft starter has to be selected two performance classes higher than the motor used

Application	Large fan	Mill	Crusher	Circular saw/bandsaw
Starting parameters				
• Voltage ramp and current limiting				
- Starting voltage %	30	50	50	30
- Starting time s	60	60	60	60
- Current limit value	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$	$4 \times I_M$
• Torque ramp				
- Starting torque	20	50	50	20
- End torque	150	150	150	150
- Starting time	60	60	60	60
• Breakaway pulse	Deactivated (0 ms)	80 %, 300 ms	80 %, 300 ms	Deactivated (0 ms)
Ramp-down mode	Free ramp-down	Free ramp-down	Free ramp-down	Free ramp-down

Note:

These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during commissioning. The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

Circuit concept

The SIRIUS 3RW44 soft starters can be operated in two different types of circuit.

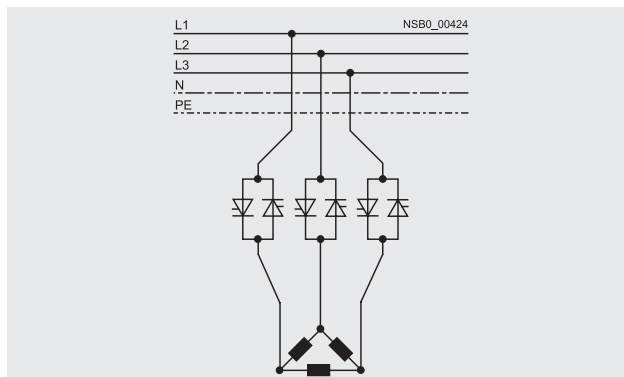
- **Inline circuit**

The controls for isolating and protecting the motor are simply connected in series with the soft starter. The motor is connected to the soft starter with three cables.

- **Inside-delta circuit**

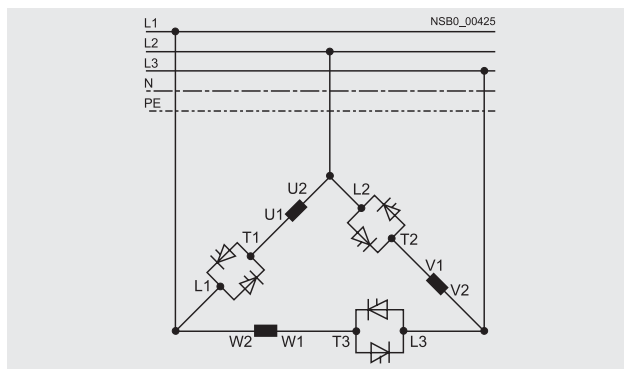
The wiring is similar to that of wye-delta starters. The phases of the soft starter are connected in series with the individual motor windings. The soft starter then only has to carry the phase current, amounting to about 58 % of the rated motor current (conductor current).

Comparison of the types of circuit



Inline circuit:

Rated current I_n corresponds to the rated motor current I_n , 3 cables to the motor



Inside-delta circuit:

Rated current I_n corresponds to approx. 58 % of the rated motor current I_n , 6 cables to the motor (as with wye-delta starters)

Which circuit?

Using the inline circuit involves the lowest wiring outlay. If the soft starter to motor connections are long, this circuit is preferable.

With the inside-delta circuit there is double the wiring complexity but a smaller size of device can be used at the same rating.

Thanks to the choice of operating mode between the inline circuit and inside-delta circuit, it is always possible to select the most favorable solution.

The braking function is possible only in the inline circuit.

Configuration

The 3RW44 solid-state soft starters are designed for normal starting. In case of heavy starting or increased starting frequency, a larger device must be selected.

For long starting times it is recommended to have a PTC sensor in the motor. This also applies for the ramp-down modes smooth ramp-down, pump ramp-down and DC braking, because during the ramp-down time in these modes, an additional current load applies in contrast to free ramp-down.

In the motor feeder between the SIRIUS 3RW soft starter and the motor, no capacitive elements are permitted (e. g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately.

A bypass contact system and solid-state overload relay are already integrated in the 3RW44 soft starter and therefore do not have to be ordered separately.

The harmonic component load for starting currents must be taken into consideration for the selection of motor starter protectors (selection of release).

Note:

When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Device interface, PROFIBUS DP communication module, Soft Starter ES parameterizing and operating software

The 3RW44 electronic soft starters have a PC interface for communicating with the Soft Starter ES software or for connecting the external display and operator module. If the optional PROFIBUS communication module is used, the 3RW44 soft starter can be integrated in the PROFIBUS network and communicate using the GSD file or Soft Starter ES Premium software.

The Soft Starter ES parameterizing and operating software can be downloaded from www.usa.siemens.com > Software with a 14-day trial license.

More information about Soft Starter ES can be found in Chapter 12 of Catalog LV 1.

For Operation in the Control Cabinet

3RW Soft Starters

3RW44
for high-feature applications

• Revised •
07/20/15

Manual for SIRIUS 3RW44

Besides containing all important information on configuring, commissioning and servicing, the manual also contains example circuits and the technical specifications for all devices.

Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

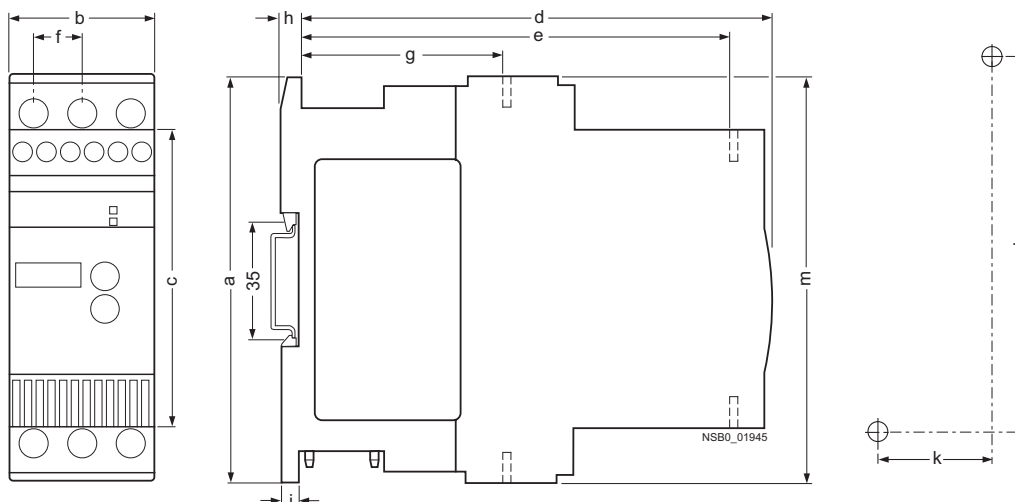
The Win-Soft Starter selection and simulation program can be downloaded from: www.usa.siemens.com > Software

More information can be found on the Internet at:
www.usa.siemens.com

Dimensional drawings

3RW30 for standard applications

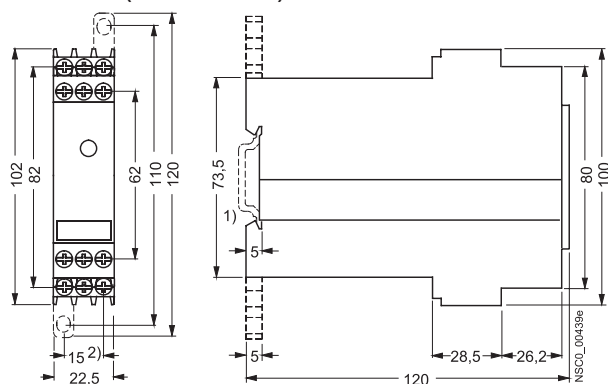
3RW30 1. ... 3RW30 4.



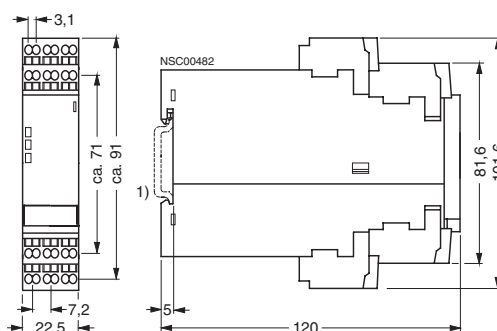
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW30 1.-1.	95	45	62	146	126	14.4	63	5	6.5	35	85	95
3RW30 1.-2.	95	45	62	146	126	14.4	63	5	6.5	35	85	117.2
3RW30 2.-1.	125	45	92	146	126	14.4	63	5	6.5	35	115	125
3RW30 2.-2.	125	45	92	146	126	14.4	63	5	6.5	35	115	150
3RW30 3.	160	55	110	163	140	18	63	5	6.5	30	150	144
3RW30 4.	170	70	110	181	158	22.5	85	5	10	60	160	160

Clearances to grounded parts (mm)	Lateral	Top	Bottom	Fixing screws	Tightening torques (Nm)
3RW30 1.	5	60	40	M4	1
3RW30 2.	5	60	40	M4	1
3RW30 3.	30	60	40	M4	1
3RW30 4.	30	60	40	M4	2

3RW30 03-1. (screw terminals)



3RW30 03-2. (spring-type terminals)



¹⁾ For mounting onto standard mounting rail TH 35 according to EN 60715.

²⁾ Dimension for screw fixing.

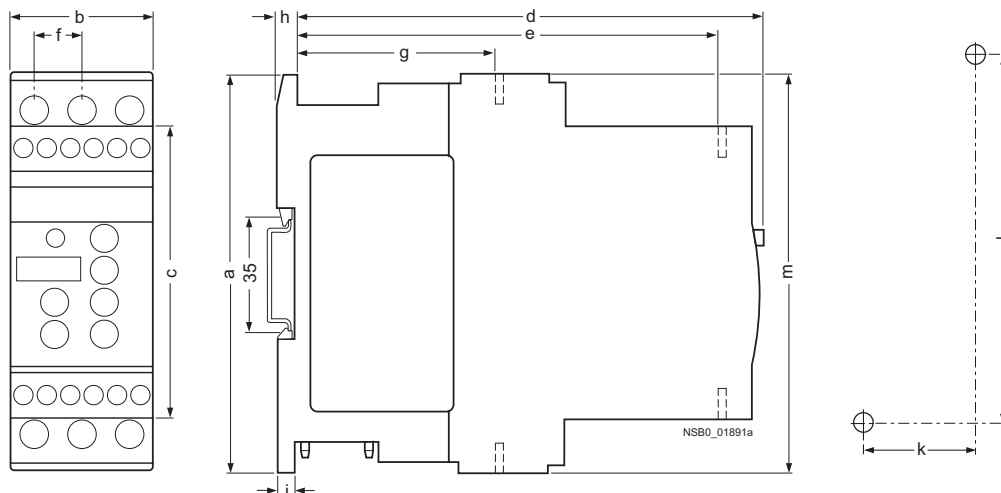
Screw fixing with two 3RP1 903 push-in lugs per 3RW30 03 device.

For Operation in the Control Cabinet

3RW Soft Starters

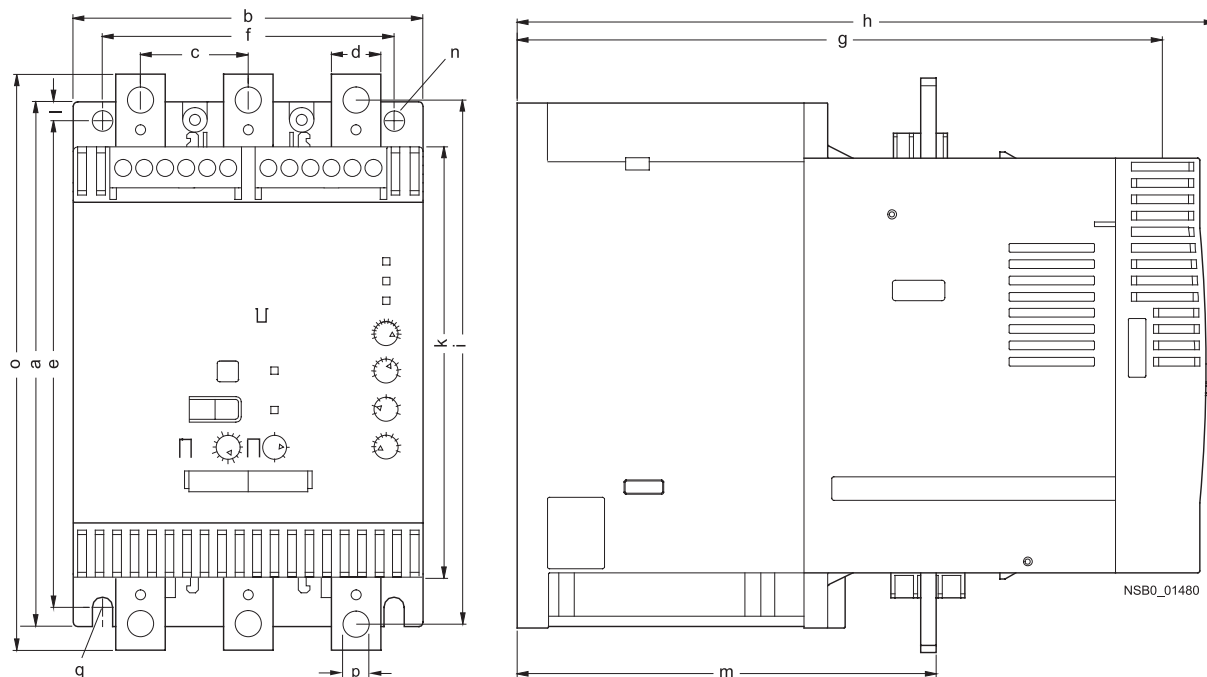
Project Planning aids

3RW40 for standard applications



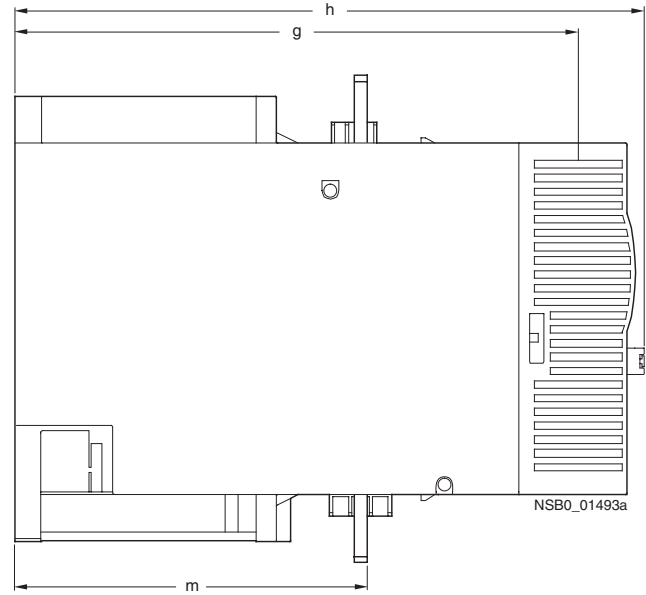
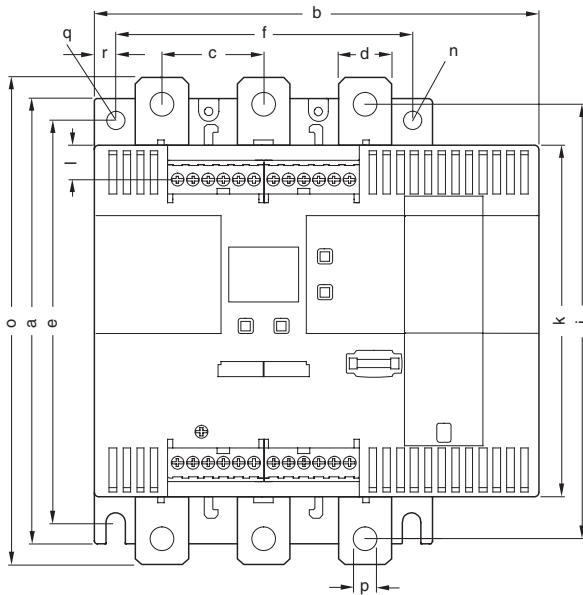
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW40 2.-1.	125	45	92	149	126	14.4	63	5	6.5	35	115	125
3RW40 2.-2.	125	45	92	149	126	14.4	63	5	6.5	35	115	150
3RW40 3.	170	55	110	165	140	18	63	5	6.5	30	150	144
3RW40 4.	170	70	110	183	158	22.5	85	5	10	60	160	160

Clearances to grounded parts (mm)	Lateral	Top	Bottom	Fixing screws	Tightening torques (Nm)
3RW40 2.	5	60	40	M4	1
3RW40 3.	30	60	40	M4	1
3RW40 4.	30	60	40	M4	2



Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q
3RW40 5.	180	120	37	17	167	100	223	250	180	148	6.5	153	7	198	9	M6, 10 Nm
3RW40 7.	210	160	48	25	190	140	240	278	205	166	10	166	9	230	11	M8, 15 Nm

3RW44 2., 3RW44 3. and 3RW44 4. for High-Feature applications



NSB0_01493a

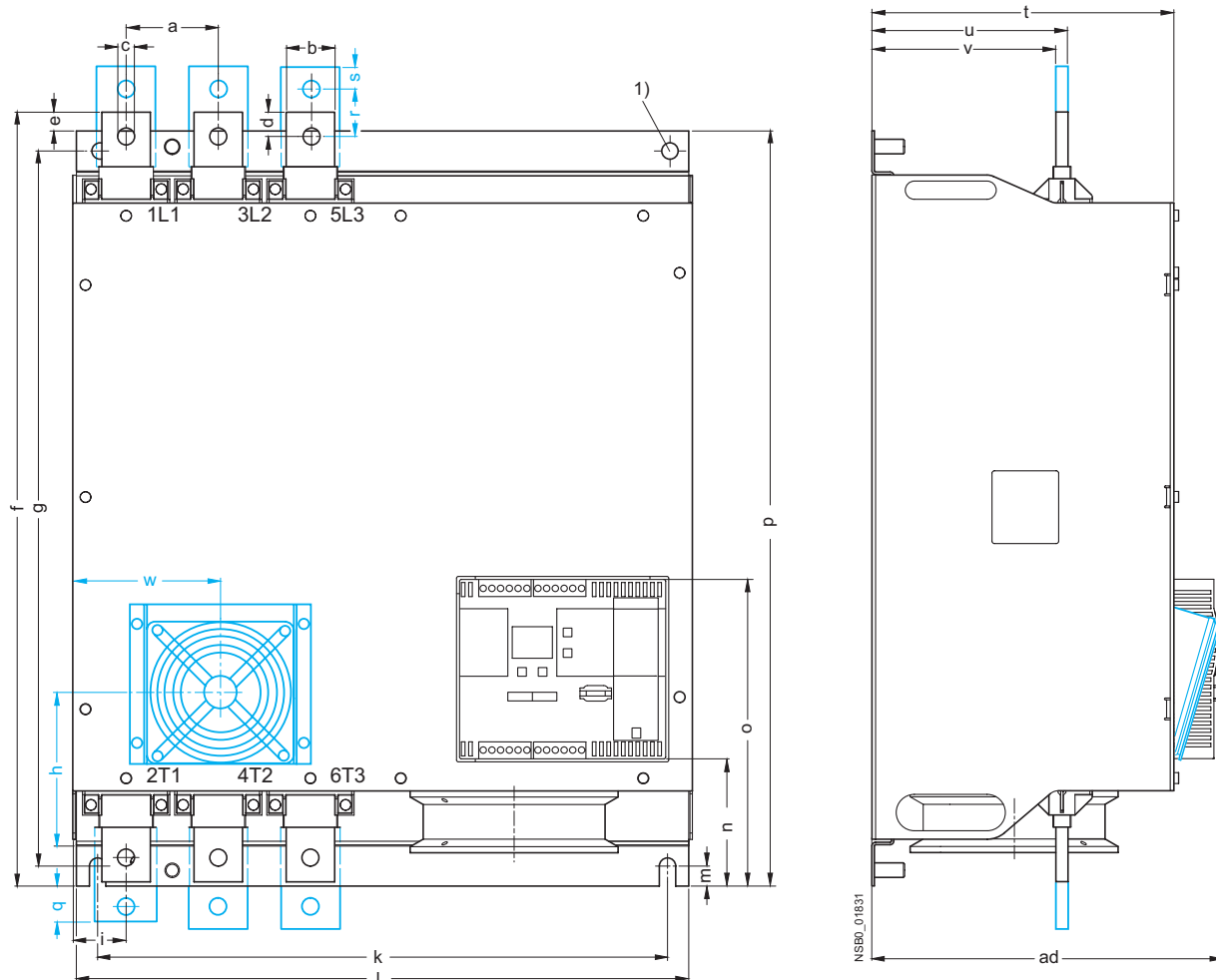
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r
3RW44 2.	180	170	37	11	167	100	240	270	174	148	7.5	153	7	184	6.6	M6, 10 Nm	10
3RW44 3.	180	170	37	17	167	100	240	270	174	148	7.5	153	7	198	9	M6, 10 Nm	10
3RW44 4.	210	210	48	25	190	140	269	298	205	166	16	166	9	230	11	M8, 15 Nm	10

For Operation in the Control Cabinet

3RW Soft Starters

Project Planning aids

3RW44 5. and 3RW44 6. for High-Feature applications

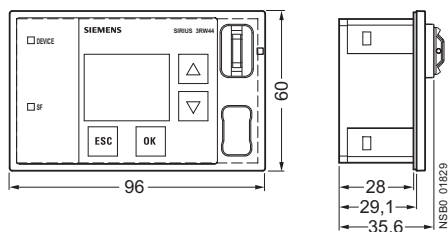


1) For M12 screw, tightening torque max. 35 Nm (310 lb.in).

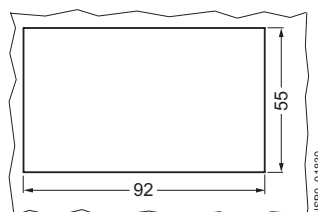
Type/Dimension (mm)	a	b	c	d	e	f	g	h	i	k	l	m
3RW44 5.	76	40	14	20	15.5	638.5	590	--	44	470	510	16.5
3RW44 6.	85	50	14	--	--	667	660	160	37.5	535	576	16.5

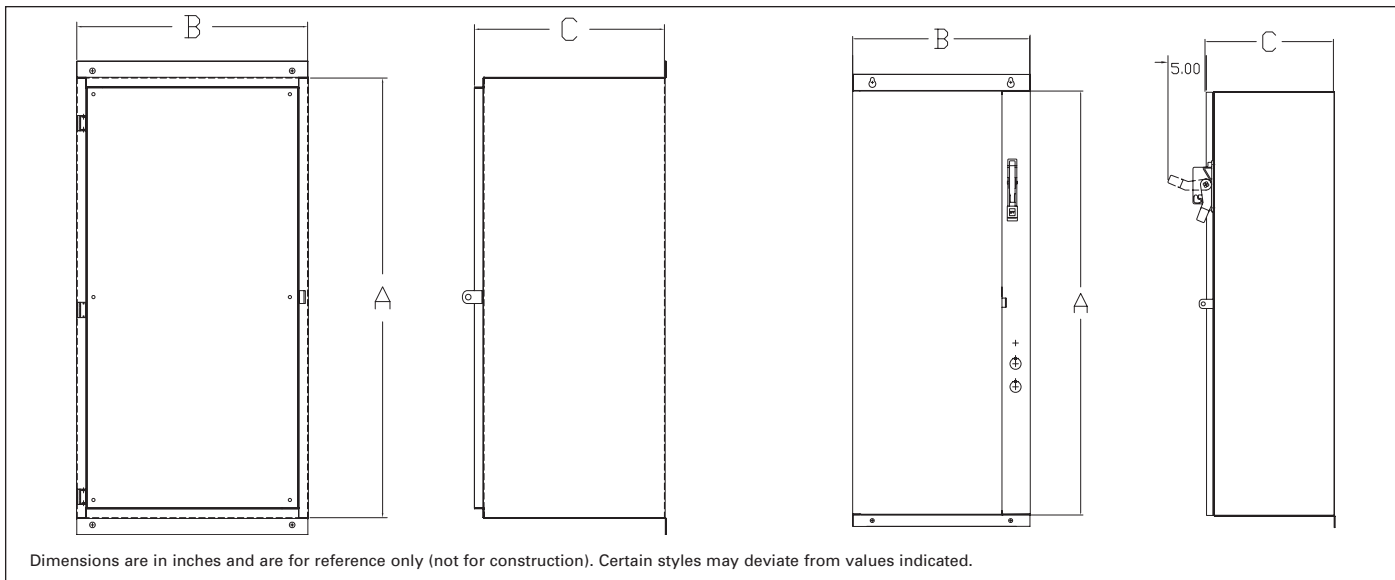
Type/Dimension (mm)	n	o	p	q	r	s	t	u	v	w	ad
3RW44 5.	105	253	623	--	--	--	249	162	152	--	290
3RW44 6.	103	251	693	43.5	40	20	249	162	151.4	123	290

3RW49 00-0AC00 external display and operator module



Installation cutout for 3RW49 00-0AC00 external display and operator module





Non-Combination Class 73

N1, N12, N4 Standard Enclosure

	Amps	A	B	C
3RW40new	11 - 73	25	18	13
	98	36	23	10
3RW40	117-145	36	18	15
	205-315	36	22	20
	385	54	36	20
3RW44	26 - 68	26	12.5	15
	82 - 117	36	18	15
	145 - 215	36	22	20
	280 - 385	54	36	20
	494 - 780	90	40	20
	970 - 1076	90	50	20

N4 Stainless Steel Standard Enclosure

	Amps	A	B	C
3RW40new	11- 98	55	29	11
3RW40	117	36	18	15
	145 - 205A	36	22	20
	248 - 385	54	36	20
3RW44	26 - 51	26	12.5	15
	68 - 82	36	18	15
	100 - 117	36	22	20
	145 - 385	54	36	20

N1, N12, N4 Modified Enclosure

	Amps	A	B	C
3RW40	117-385	56	36	20
3RW44	26-51	36	22	20
	68-385	54	36	20

N4 Stainless Steel Modified Enclosure

	Amps	A	B	C
3RW40	117-385	54	36	20
3RW44	26-51	36	22	20
	68-385	54	36	20

Combination Type Class 74

N1, N12, N4 Standard Enclosure

	Amps	A	B	C
3RW40new	11 - 73	36	20	11
	98	46	20	10
3RW40	117	50	25	20
	145 - 205	66	25	20
	248 - 315	90	30	20
	385	90	40	20
3RW44	26 - 68	36	23	15
	82 - 117	50	25	20
	145 - 215	66	25	20
	280	90	30	20
	315 - 384	90	40	20
	494	90	40	20
	551 - 780	90	40 ^①	20
	970 - 1076	90	50	20

N1, N12 Fusible

	Amps	A	B	C
3RW44	494-780	90	50	20

N4 Stainless Steel Standard Enclosure

	Amps	A	B	C
3RW40new	11- 98	55	29	11
3RW40	117 - 145	54	36	20
	205 - 300	90	40	20
3RW44	26 - 42	36	23	15
	51 - 100	50	25	20
	117 - 145	54	36	20
	180 - 385	90	40	20

N1, N12, N4 Modified Enclosure

	Amps	A	B	C
3RW40	117 - 248	76	30	20
	315	90	30	20
	385	90	40	20
3RW44	26 - 215	76	30	20
	280	90	30	20
	315 - 385	90	40	20

N4 Stainless Steel Modified Enclosure

	Amps	A	B	C
3RW40	117-145	76	30	20
3RW44	26-145	76	30	20

① Add 4" for N4.

For Operation in the Control Cabinet

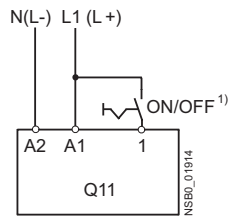
3RW Soft Starters

Project Planning aids

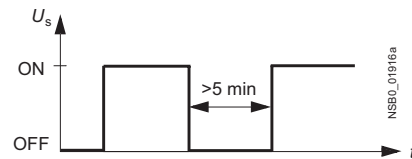
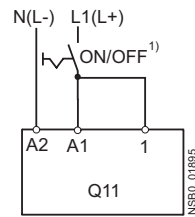
Schematics

3RW30 .. connection examples for control circuit

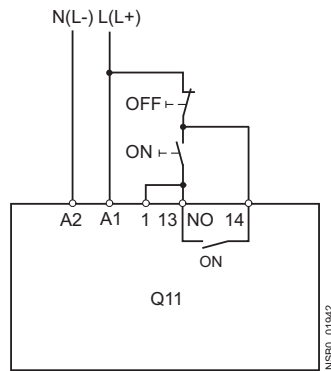
Control using switches



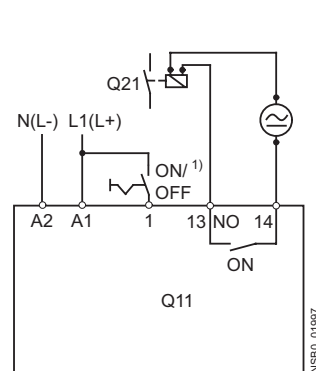
Automatic mode



Control by pushbutton

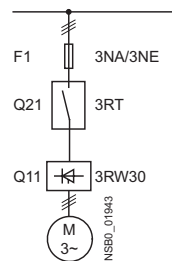


Control of a main contactor

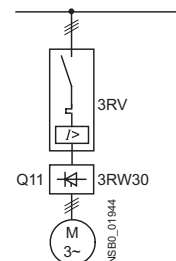


3RW30 connection examples for main circuit²⁾

3RW30 – 3-phase motor with 3NA/3NE fuse



3RV motor starter protector



¹⁾ Caution: Risk of restarting!

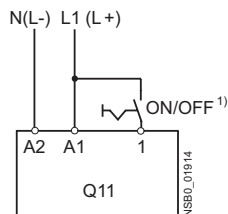
When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 1.

²⁾ As an alternative, the motor feeder can also be installed as a fuseless or as a fused version. For fuse and switching device coordination, see "Technical specifications".

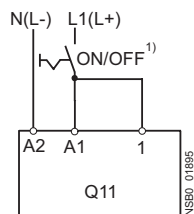
The wiring diagrams are provided only as examples.

3RW40 2. ... 3RW40 4. connection examples for control circuit

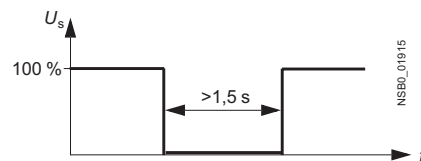
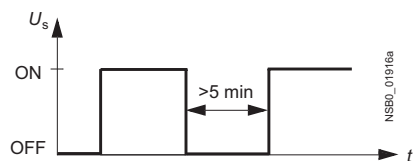
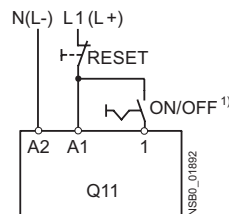
Control using switches



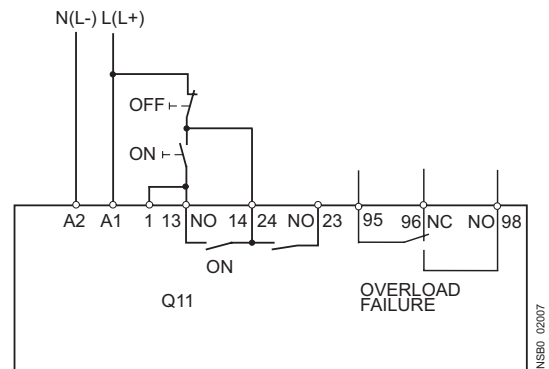
Automatic mode



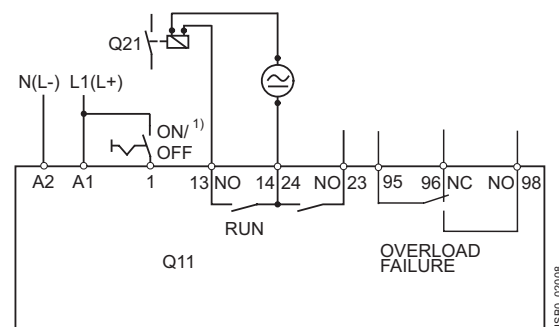
Control with remote reset



Control of 3RW40 2. ... 3RW40 4. by pushbutton

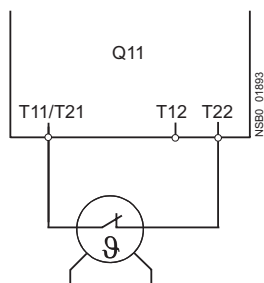


Control of a main contactor

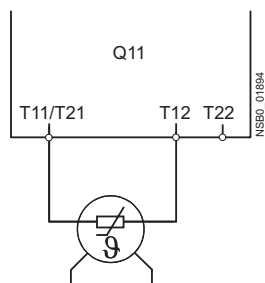


Connection example of 3RW40 2. ... 3RW40 4. for PTC sensors (thermistor motor protection)

Thermoclick



PTC type A



1) Caution: Risk of restarting!

When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 1.

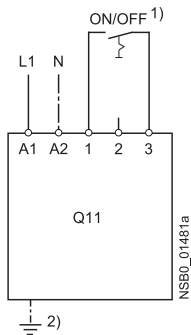
For Operation in the Control Cabinet

3RW Soft Starters

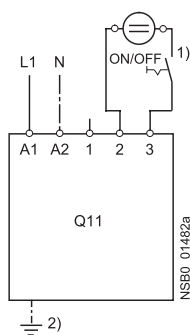
Project Planning aids

3RW40 5. and 3RW40 7. connection examples for control circuit

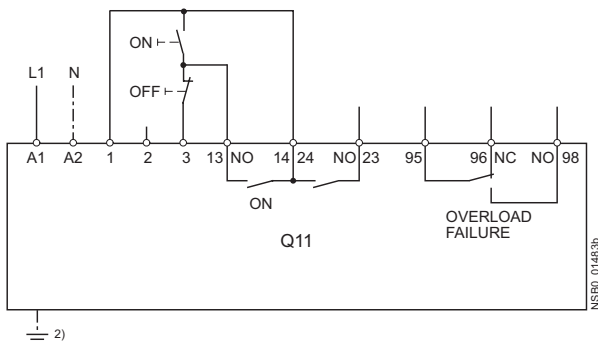
Control by switch using internal 24 V DC supply



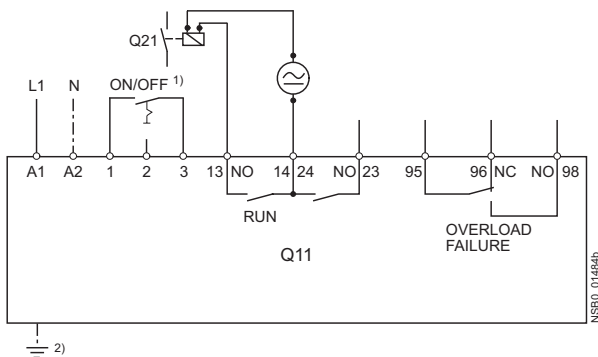
external power supply



Control by pushbutton

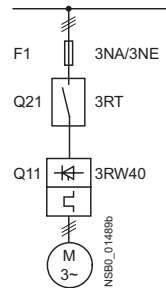


Control of a main contactor

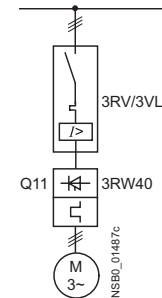


3RW40 connection examples for main circuit³⁾

3RW40 – 3-phase motor with 3NA/3NE fuse



3RV motor starter protector/ 3VL circuit breaker



1) Caution: Risk of restarting!

When operating with a switch (ON/OFF) a new, automatic restart will take place automatically if the start command is still active at terminal 3.

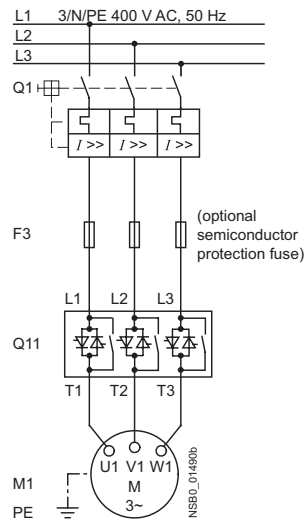
2) Grounding necessary for fan connection to 3RW40 5...

3) As an alternative, the motor feeder can also be installed as a fuseless or as a fused version. [For fuse and switching device coordination, see "Technical specifications"](#).
The wiring diagrams are provided only as examples.

3RW44 connection examples for main and control circuits

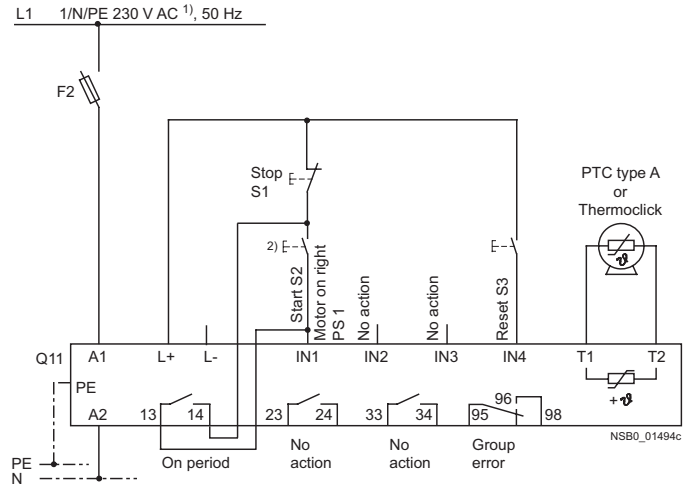
Main circuit

Possibility 1a:
Inline circuit with motor starter protector and SITOR fuse
(semiconductor protection only)



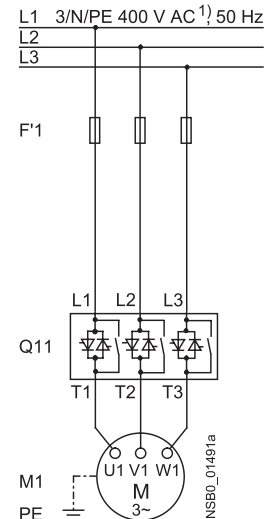
Control circuit

Possibility 1:
Control by pushbutton

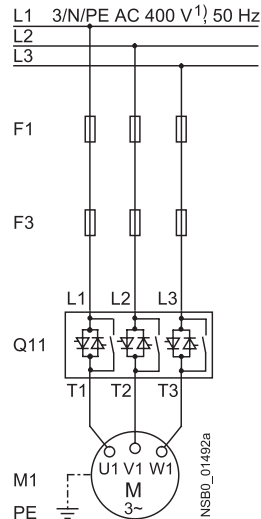


Main circuit

Possibility 1b:
Inline circuit with all-range
protection
(line and semiconductor protection)



Possibility 1c:
Inline circuit with line and
SITOR fuse
(semiconductor protection only)



¹⁾ Permissible values for main and control voltage, see "Technical specifications".

²⁾ Caution: Risk of restarting!

Because the output is parameterized to "Motor ON", the start command is automatically active after the reset command and a new, automatic restart will take place. This applies especially in case of motor protection tripping. For safety reasons we recommend connecting the group error output (terminals 95/96) in series with the output parameterized to "Motor ON".

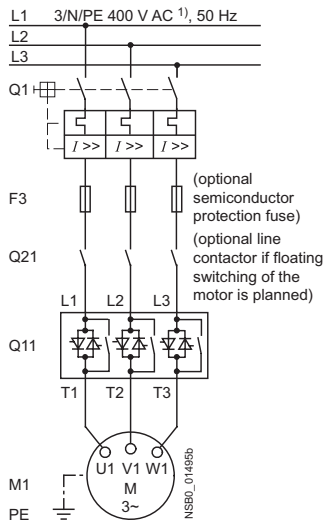
For Operation in the Control Cabinet

3RW Soft Starters

Project Planning aids

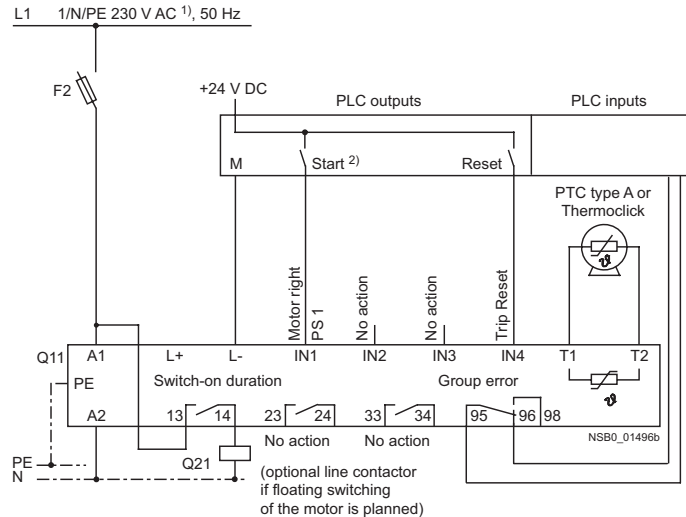
Main circuit

Possibility 2:
Inline circuit with main contactor



Control circuit

Possibility 2:
Control of a main contactor and control by means of PLC



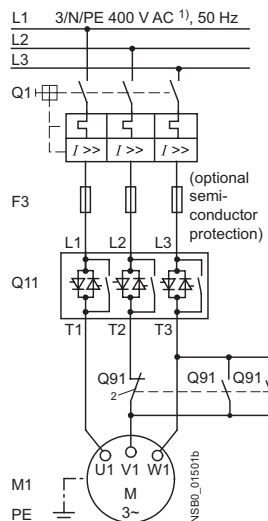
1) Permissible values for main and control voltage, see "Technical specifications".

2) **Caution: Risk of restarting!**

The start command (e. g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping. For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

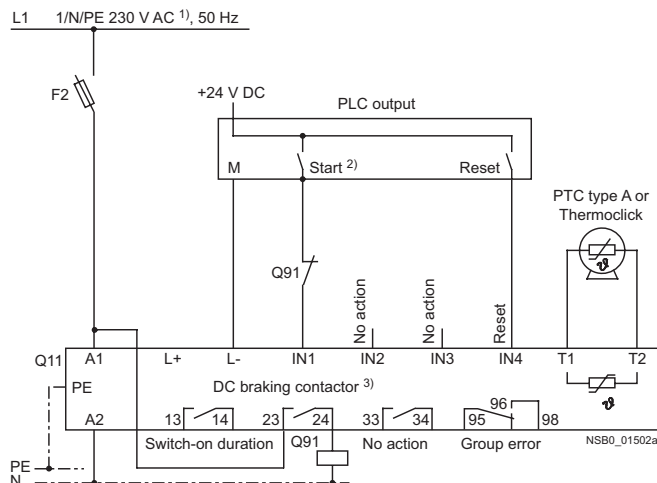
Main circuit

Possibility 3a:
Inline circuit with ramp-down function DC braking³⁾
(for device types 3RW44 22 to 3RW44 25)



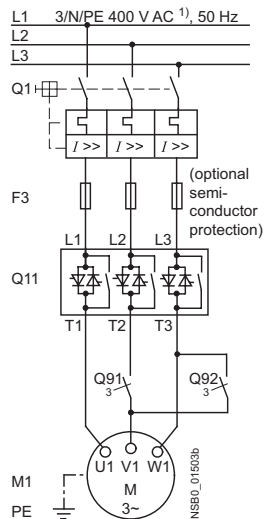
Control circuit

Possibility 3a:
Control of the DC braking contactor³⁾



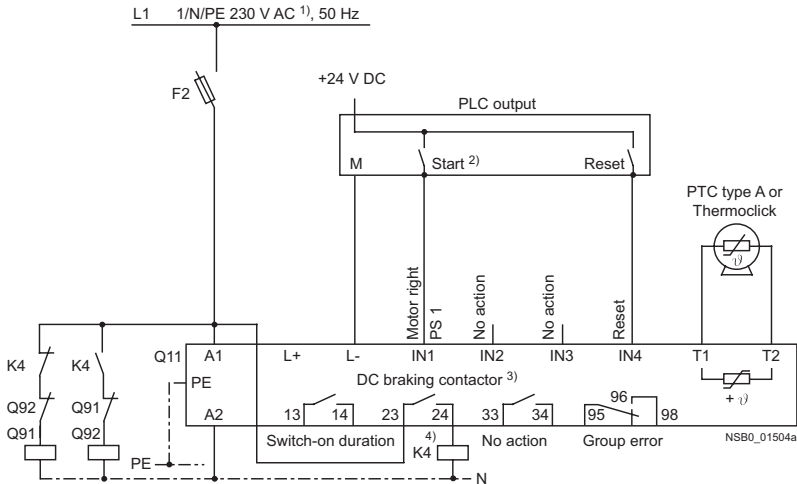
Main circuit

Possibility 3b:
Inline circuit with ramp-down function DC braking³⁾
(for device types 3RW44 26 to 3RW44 47)



Control circuit

Possibility 3b:
Control of the DC braking contactor³⁾



¹⁾ Permissible values for main and control voltage, see "Technical specifications".

²⁾ Caution: Risk of restarting!

The start command (e. g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping.
For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.

³⁾ If the ramp-down function "Combined braking" is selected, no braking contactor is required.

If the ramp-down function "DC braking" is selected, a braking contactor must be used in addition. For type see "Fuse Assignment (Inline Circuit)" on pages 7/47 to 7/49.

For applications with large centrifugal masses ($J_{Load} > J_{Motor}$) we recommend the function "DC braking".

The output 2 must be switched over to "DC braking contactor".

⁴⁾ Auxiliary relay K4, e. g.:

LZX:RT4A4T30 (230 V AC rated control supply voltage),
LZX:RT4A4S15 (115 V AC rated control supply voltage).

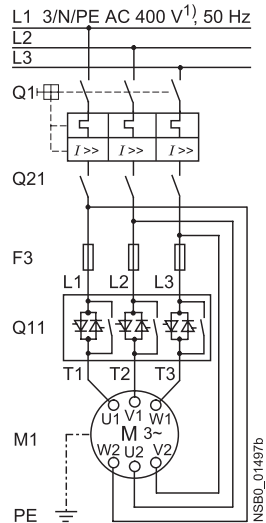
For Operation in the Control Cabinet

3RW Soft Starters

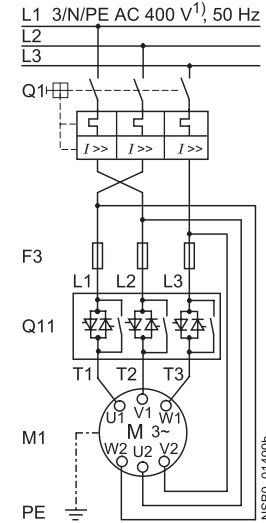
Project Planning aids

Main circuit

Possibility 4a:
Inside-delta circuit

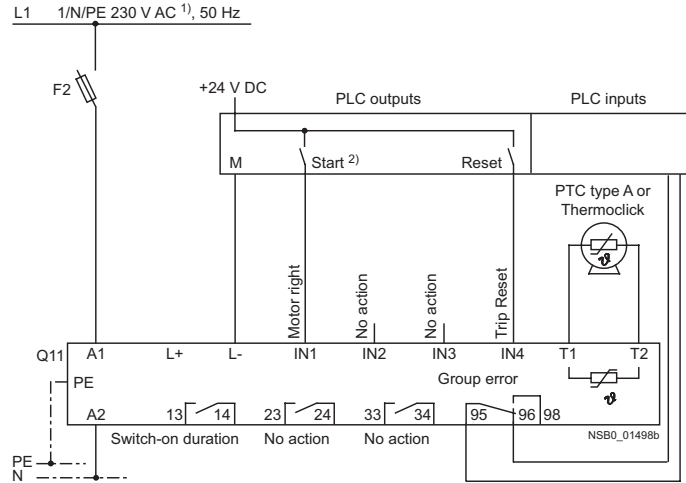


Possibility 4b:
Change of direction of rotation for
inside-delta circuit



Control circuit

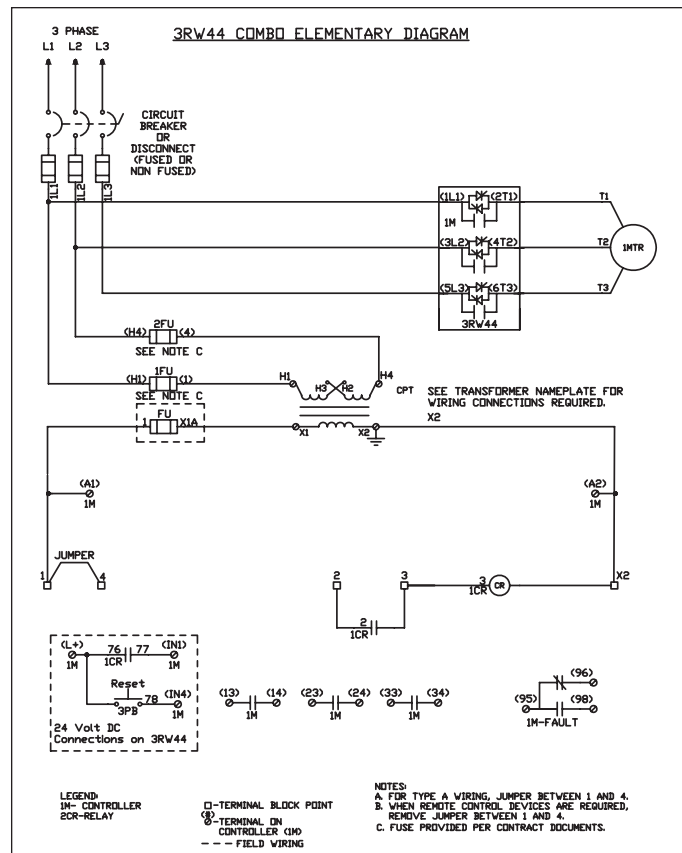
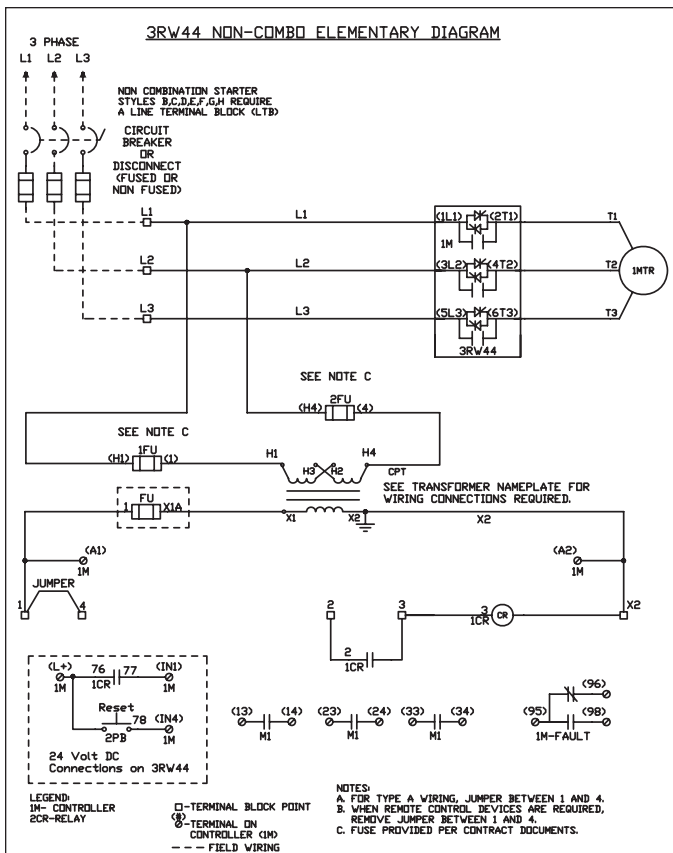
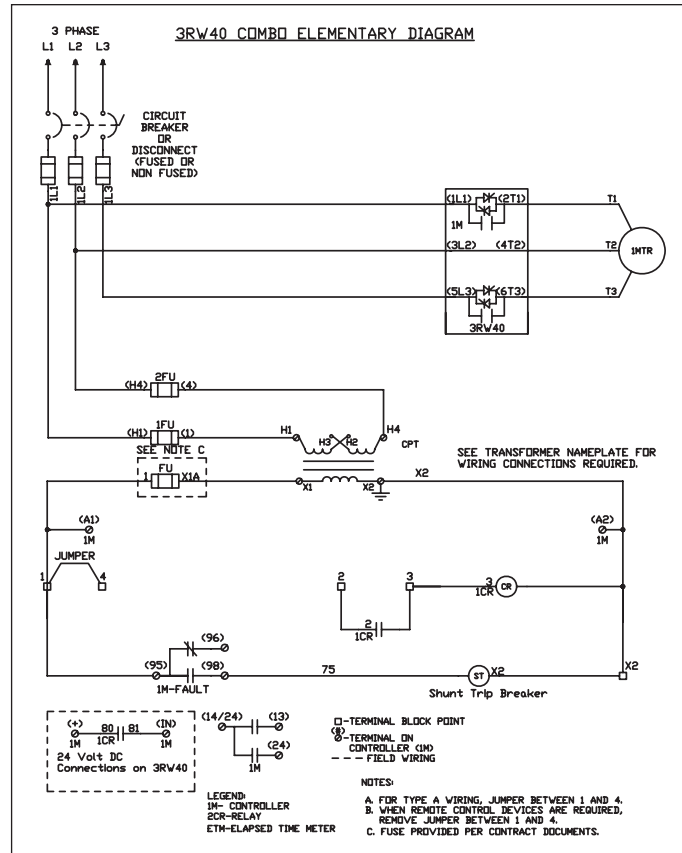
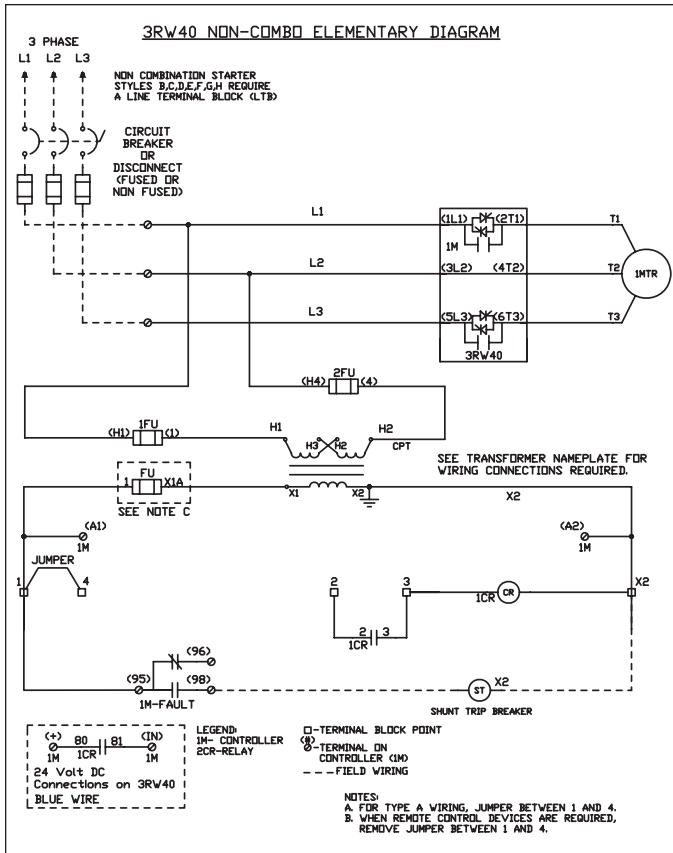
Possibility 4:
Control by means of PLC



1) Permissible values for main and control voltage, see
"Technical specifications".

2) **Caution: Risk of restarting!**

The start command (e. g. from the PLC) must be reset prior to a reset command because a new, automatic restart will take place automatically if a start command is active after the reset command. This applies especially in case of motor protection tripping.
For safety reasons we recommend incorporating the group error output (terminals 95 and 96) in the controller.



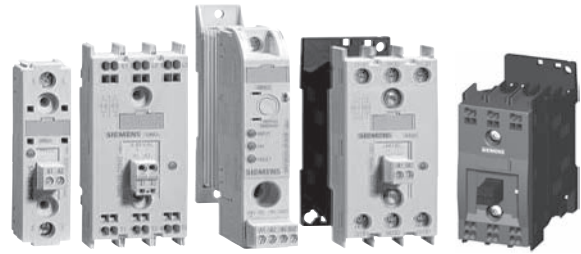
For Operation in the Control Cabinet

3RW Soft Starters

Notes

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Solid-State Switching Devices

Introduction

Overview



SIRIUS solid-state switching devices for switching resistive loads

Solid-state relays

22.5 mm solid-state relays,
45 mm solid-state relays

- Widths of 22.5 mm and 45 mm
- Compact and space-saving design
- "Zero-point switching" version
- Mounting onto existing heat sinks

Order No. Page

3RF21, 8/9
3RF20, 8/10
3RF22, 8/43

Solid-state contactors

Solid-state contactors

- Complete units comprising a solid-state relay and an optimized heat sink, "ready to use"
- Compact and space-saving design
- Versions for resistive loads "zero-point switching" and inductive loads "instantaneous switching"
- Special versions "Low Noise" and "Short-Circuit Resistant"

3RF23, 8/24
3RF24, 8/46

8/8, 8/12

Function modules

For extending the functionality of the 3RF21 solid-state relays and the 3RF23 solid-state contactors for many different applications:

Converters

- For converting an analog input signal into an on/off ratio; can also be used on 3RF22 and 3RF24 3-phase switching devices

3RF29 00-0EA18 8/13

Load monitoring

- For load monitoring of one or more loads (partial loads)

3RF29 20-0FA08, 8/14
3RF29 .0-0GA..

Heating current monitoring

- For load monitoring of one or more loads (partial loads); remote teach

3RF29 ...0JA.. 8/14

Power control regulators

- For supplying the current by means of a solid-state switching device depending on a setpoint value. There is a choice of full-wave control and generalized phase control.

3RF29 ...0KA. 8/14

Power controllers

- For supplying the current by means of a solid-state switching device depending on a setpoint value. Closed-loop control: Full-wave control or generalized phase control

3RF29 .0-0HA.. 8/15

SIRIUS Innovations solid-state switching devices for switching motors

Solid-state contactors

Solid-state contactors
Solid-state reversing contactors

- Complete "ready to use" units with an integrated insulated heatsink
- Compact and space-saving design
- Version for motors, "instantaneous switching"

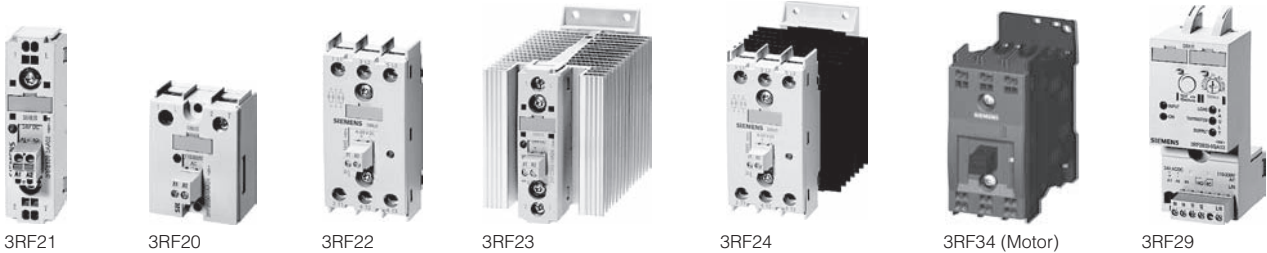
3RF34, 8/16
8/17

Nomenclature Guide

3RF2	0	20	-	1	A	A	0	2
SIRIUS SC	Type	Rating		Terminal Type	Switching	Control Phases	Coil Type	Power Voltage
	0 = 45 mm Relay 1 = 22.5 mm Relay 2 = 3-phase 45 mm Relay 3 = Contactor 4 = 3-phase Contactor 9 = Function Module			1 = Screw 2 = Spring 3 = Ring Tongue	A = Zero Point B = Instantaneous C = Low Noise D = Short Circuit	A = 1-phase B = 2-phase C = 3-phase	0 = 24 VDC 2 = 110 - 230 VAC 4 = 4 - 30 VDC 5 = 230 VAC	2 = 24 - 230 VAC 4 = 230 - 460 VAC 5 = 48 - 600 VAC 6 = 400 - 600 VAC

Note: This is only a guide to decode the model number. All possible combinations of these are not produced.
Character of "3" in position four indicates Sirius Innovations

Overview



SIRIUS 3RF2 solid-state switching devices

Solid-state switching devices for resistive loads

- Solid-state relays
- Solid-state contactors
- Function modules

Solid-state switching devices for switching motors

- Solid-state contactors
- Solid state reversing contactors

The most reliable solution for any application

Compared to electro mechanical contactors, our SIRIUS 3RF2 solid-state switching devices stand out due to their considerably longer service life. Thanks to the high product quality, their switching is extremely precise, reliable and, above all, insusceptible to faults. With its variable connection methods and a wide spread of control voltages, the SIRIUS 3RF2 family is universally applicable. Depending on the individual requirements of the application, our modular switchgear can also be quite easily expanded by the addition of standardized function modules.

Semiconductor relays

SIRIUS SC semiconductor relays are suitable for surface mounting on existing cooling surfaces. Installation is quick and easy, involving just two screws. Depending on the nature of the heat sink, the capacity reaches up to 88 A on resistive loads. The 3RF21 semiconductor relays can be expanded with various function modules to adapt them to individual applications.

The semiconductor relays are available in 2 different widths:

- 3RF21 semiconductor relay with a width of 22.5 mm
- 3RF20 and 3RF22 semiconductor relay with a width of 45 mm

Both variants are only available in the "zero-point switching" version. This standard version is ideally suited for operation with resistive loads.

Selecting semiconductor relays

When selecting semiconductor relays, in addition to information about the power system, the load and the ambient conditions it is also necessary to know details of the planned design. The semiconductor relays can only conform to their specific technical specifications if they are mounted with appropriate care on an adequately dimensioned heat sink. The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select the relay design and choose a semiconductor relay with higher rated current than the load requires
- Determine the thermal resistance of the proposed heat sink
- Check the correct relay size with the aid of the diagram

Solid-state contactors for switching motors

The solid-state contactors for switching motors are intended for frequently switching on and off three-phase current operating mechanisms up to 5 HP and reversing up to 3 HP. The

devices are constructed with complete insulation and can be mounted directly to 3RV1 MSPs and SIRIUS overload relays, resulting in a very simple integration into motor feeders.

These three-phase solid-state contactors are equipped with a two-phase control which is particularly suitable for typical motor current circuits without connecting to the neutral conductor.

Important features:

- Insulated enclosure with integrated heat sink
- Degree of protection IP20
- Integrated mounting foot to snap on a standard mounting rail or for assembly onto a support plate
- Variety of connection methods
- Plug-in control connection
- Display via LEDs

Selecting solid-state contactors

The solid-state contactors are selected on the basis of details of the network, the load and the ambient conditions. As the solid-state contactors are already equipped with an optimally matched heat sink, the selection process is considerably simpler than that for solid-state relays.

The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select a solid-state contactor with the same or higher rated current than the load
- Testing the maximum permissible switching frequency based on the characteristic curves. To do this, the starting current, the starting time and the motor load in the operating phase must be known.
- If the permissible switching frequency is below the desired frequency, it is possible to achieve an increase by overdimensioning the motor.

Benefits

- Devices with integrated heat sink, "ready to use"
- Compact and space-saving design
- Reversing contactors with integrated interlocking

Application

Standards and approvals

- IEC 60947-4-3
- UL 508, CSA for North America¹⁾
- CE marking for Europe
- C-Tick approval for Australia

¹⁾ Please note: For reversing motor applications use overvoltage protection device Type 3TX7462-3L; max. cut-off-voltage 6000 V; min. energy handling capability 100 J.

Solid-State Switching Devices

General data

Type	Solid-state relays			Solid-state contactors		Function modules					
	1-phase 22.5 mm	45 mm	3-phase 45 mm	1-phase	3-phase	Converter	Load monitoring Basic	Extended	Heating current monitoring	Power control- lers	Power regula- tors
Usage											
Simple use of existing solid-state relays	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	--	--	--	--	--	--
Complete device "Ready to use"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	--	--	--	--
Space-saving	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	--	--
Can be extended with modular function modules	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	--	--	--	--
Frequent switching and monitoring of loads and solid-state relays/solid-state contactors	--	--	--	--	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monitoring of up to 6 partial loads	--	--	--	--	--	--	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	--	--
Monitoring of more than 6 partial loads	--	--	--	--	--	--	--	<input checked="" type="checkbox"/>	--	--	--
Control of the heating power through an analog input	--	--	--	--	--	<input checked="" type="checkbox"/>	--	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Power control	--	--	--	--	--	--	--	--	--	--	<input checked="" type="checkbox"/>
Startup											
Easy setting of setpoints with "Teach" button	--	--	--	--	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
"Remote Teach" input for setting setpoints	--	--	--	--	--	--	--	--	<input checked="" type="checkbox"/>	--	--
Mounting											
Mounting onto mounting rails or mounting plates	--	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	--	--	--	--
Can be snapped directly onto a solid-state relay or contactor	--	--	--	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
For use with "Coolplate" heat sink	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	--	--	--	--	--	--
Cable routing											
Connection of load circuit as for controls	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Connection of load circuit from above	--	<input checked="" type="checkbox"/>	--	--	--	--	--	--	--	--	--

☒ Function is available

☐ Function is possible

Note: Permissible for use at altitudes of more than 2500 m above sea level with the following derating for 3RF2 Devices:

Site altitude 2500 m above sea level:

- Reduction of rated insulation voltage to $0,93 \times U_i$
- Reduction of load current to $0,93 \times I_e$

Site altitude 3000 m above sea level:

- Reduction of rated insulation voltage to $0,88 \times U_i$
- Reduction of load current to $0,9 \times I_e$

Site altitude 4000 m above sea level:

- Reduction of rated insulation voltage to $0,79 \times U_i$
- Reduction of load current to $0,8 \times I_e$

Site altitude 5000 m above sea level:

- Reduction of rated insulation voltage to $0,75 \times U_i$
- Reduction of load current to $0,7 \times I_e$

These ratings apply to a maximum ambient temperature of 40 °C (140 °F).

Benefits

- Considerable space savings thanks to a width of only 22.5 mm
- Variety of connection techniques: screw connection, spring-type connection or ring terminal end, makes for easy terminations
- Flexible for a wide range of applications with function modules for retrofitting
- Possibility of fuseless short-circuit resistant design

Advantages:

- Saves time and costs with easy wiring, simple installation and fast commissioning
- Extremely long life, low maintenance, rugged and reliable
- Space-saving and safe thanks to side-by-side mounting up to an ambient temperature of +60 °C
- Modular design: standardized function modules and heat sinks can be used in conjunction with 22.5 mm style semiconductor relays to satisfy unique application requirements
- Vibration-resistant and shock-resistant spring-loaded terminal connection system provides a superior connection even under tough conditions

Area of application

Applications

Solid-state relays

SIRIUS solid-state relays are suitable for surface mounting on existing cooling surfaces. Installation is quick and easy, involving just two screws. The special technology of the power semiconductor ensures there is excellent thermal contact with the heat sink. Depending on the nature of the heat sink, the capacity reaches up to 88 A on resistive loads.

The solid-state relays are available in three different versions:

- 3RF21 single-phase solid-state relay with a width of 22.5 mm
- 3RF20 single-phase solid-state relay with a width of 45 mm
- 3RF22 three-phase solid-state relay with a width of 45 mm

The 3RF21 and 3RF22 solid-state relays can be expanded with various function modules to adapt them to individual applications.

Solid-state contactors

The complete units consist of a solid-state relay plus optimized heat sink, and are therefore ready to use. They offer defined rated currents to make selection as easy as possible. Depending on the version, current intensities of up to 88 A are achieved. Like all of our solid-state switching devices, one of their particular advantages is their compact and space-saving design.

With their insulated mounting foot they can easily be snapped onto a standard mounting rail, or they can be mounted on carrier plates with fixing screws. This insulation enables them to be used in circuits with protective extra-low voltage (PELV) or safety extra-low voltage (SELV) in building engineering. For other applications, such as for extended personal safety, the heat sink can be grounded through a screw terminal.

The solid-state contactors are available in two different versions:

- 3RF23 single-phase solid-state contactors
- 3RF24 three-phase solid-state contactors

3RF22 three-phase solid-state relay with a width of 45 mm

With its compact design, which stays the same even at currents of up to 55 A, the 3RF22 solid-state relay is the ultimate in space-saving construction, at a width of 45 mm. Installation on cooling surfaces is quick and easy, involving just two screws. The logical connection arrangement, with the power infeed from above and connection of the load from below, ensures tidy installation in the control cabinet.

3RF24 three-phase solid-state contactors

The compact design enables small compact units with currents up to 50 A. All special features of the solid-state relays for saving time and space are effective here too.

Example plastic machine industry:

Thanks to their high switching endurance, SIRIUS SC semiconductor switching devices are ideally suited for use in the control of electroheat. This is because the more precise the temperature regulation process has to be, the higher the switching frequency needs to be. The accurate regulation of electroheat is used for example in many processes in the plastic machine industry:

- Band heaters heat the extrudate to the correct temperature in plastic extruders
- Heat emitters heat plastic blanks to the correct temperature
- Heat drums dry plastic granules
- Heating channels keep molds at the correct temperature in order to manufacture different plastic parts without defects.

The powerful SIRIUS SC semiconductor relays and contactors can be used to control several heating loads at the same time. By using a load monitoring module the individual partial loads can easily be monitored, and in the event of a failure a signal is generated which can be sent to the controller.

Protecting the semiconductor relays and semiconductor contactors with 5 SY supplemental protectors.

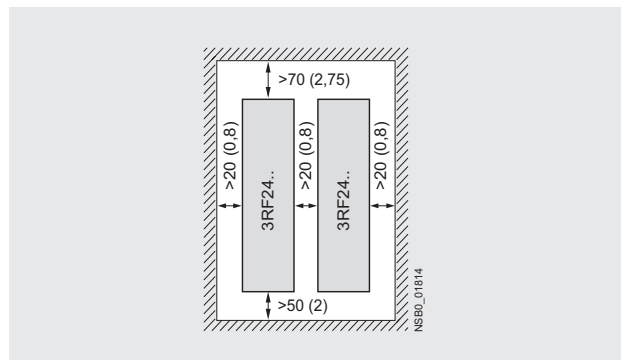
Short-circuit protection and line protection with 5 SY supplemental protectors is easy to achieve with SIRIUS SC semiconductor relays and semiconductor contactors in comparison with designing load feeders with fuses. A special version of the semiconductor contactors can be protected against damage in the case of a short-circuit with 5 SY supplementary protector with type B tripping characteristic. This allows the low-cost and simple design of fuseless load feeders with full protection of the switching device.

Design

There is no typical design of a load feeder with semiconductor relays or semiconductor contactors; instead, the great variety of connection systems and control voltages offers universal application opportunities. SIRIUS SC semiconductor relays and semiconductor contactors can be installed in fuseless or fused feeders, as required.

There are special versions with which it is even possible to achieve short-circuit strength in a fuseless design.

Mounting regulations



Distances for stand-alone installation

General data

Functions

Connection

All SIRIUS SC semiconductor switching devices are characterized by the great variety of connection methods. You can choose between the following connection techniques:

SIGUT connection system (screw)

The SIGUT connection system is the standard among industrial switching devices. Open terminals and a plus-minus screw are just two features of this technology. Two conductors of up to 6 mm^2 ¹⁾ can be connected in just one terminal. As a result, loads of up to 50 A can be connected.

Spring-loaded connection system

This innovative technology holds the conductor without screw connection. This means that very high vibration resistance is achieved. Two conductors of up to 2.5 mm^2 ¹⁾ can be connected to each terminal. As a result, loads of up to 20 A can be dealt with.

Ring terminal end connection

The ring terminal end connection is equipped with an M5 screw. Ring terminal ends of up to 25 mm^2 can be connected. In this way it is possible to connect conductors with up to 88 A safely. Additional finger safety can be provided with a special cover.

Switching types

In order to guarantee an optimized control method for different loads, the functionality of our semiconductor switching devices can be adapted accordingly.

The "**zero-point switching**" method is ideal for resistive loads, i.e. where the power semiconductor is activated at zero voltage.

For inductive loads, on the other hand, for example in the case of valves, it is better to go with "**instantaneous switching**". By distributing the ON point over the entire sine curve of the mains voltage, disturbances are reduced to a minimum.

A special "low noise" version is available due to a special control, this special version can be used in public networks up to 16A without any additional measures such as interference suppressor filters. As a result, it conforms to limit value curve class B according to EN 60947-4-3 in terms of emitted interference.

Function

Two-phase controlled version

In many three-phase applications there is no need of a three-phase controller. Loads in a delta circuit or wye circuit, which have no connection to the neutral conductor, can be safely switched on and off using only two phases.

Nevertheless, the 3RF22 and 3RF24 three-phase solid-state switching devices provide the possibility of connecting all three phases to the switching device, with the middle phase looped directly through the device. Thanks to the lower power loss compared to a three-phase controlled device it is possible for the mounted accessories to be more compact.

Three-phase controlled version

This version is used in three-phase applications which have to switch all phases on and off for system reasons or in the case of loads in a wye circuit with connection to the neutral conductor.

Performance characteristics

The performance of the semiconductor switching devices are substantially determined by the type of power semiconductors used and the internal design. In the case of the SIRIUS SC semiconductor contactors and semiconductor relays, only thyristors are used instead of less powerful Triacs.

Two of the most important features of thyristors are the blocking voltage and the maximum load integral:

Blocking voltage

Thyristors with a high blocking voltage can also be operated without difficulty in power systems with high interference voltages. Separate protective measures, such as a protective circuit with a varistor, are not necessary in most cases.

With SIRIUS SC, for example, thyristors with 800 V blocking voltage are fitted for operation in power systems up to 230 V. Thyristors with up to 1600 V are used for power systems with higher voltages.

Maximum load integral

One of the purposes of specifying the maximum load integral (Pt) is to determine the rating of the short-circuit protection. Only a large power semiconductor with a correspondingly high Pt value can be given appropriate protection against destruction from a short-circuit by means of a protective device matched to the application. However, SIRIUS SC is also characterized by the optimum matching of the thyristors (Pt value) with the rated currents. The rated currents specified on the devices in conformance with EN 60947-4-3 were confirmed by extensive testing.

1) For mm^2 to AWG conversion see page 19/21 of Industrial Controls catalog.

Selection and ordering data

Designation	Labeling area (W x H)	Color	Order No.	Std. Pack Qty	Weight per pack approx. kg
mm x mm					
Blank labels					
Unit labeling plates for "SIRIUS" ¹⁾	10 x 7	Pastel turquoise	3RT19 00-1SB10	816 units	0.110
	20 x 7	Pastel turquoise	3RT19 00-1SB20	340 units	0.220
Labels for sticking for "SIRIUS"	19 x 6	Pastel turquoise	3RT19 00-1SB60	3060 unit	0.150
	19 x 6	Zinc yellow	3RT19 00-1SD60	3060 units	0.150

Unit labeling plates
(1 frame = 20 units)

1) Computer labeling system for individual inscription of unit labeling plates available from:
murrplastik Systemtechnik GmbH (<http://www.murrplastik.de>).

Integration

Notes on integration in the load feeders

The SIRIUS solid-state switching devices are very easy to integrate into the load feeders thanks to their industrial connection method and design.

Particular attention must however be paid to the circumstances of the installation and ambient conditions, as the performance of the solid-state switching devices is largely dependent on these. Depending on the version, certain restrictions must be observed. Detailed information, for example in relation to solid-state contactors about the minimum spacing and to solid-state relays about the choice of heat sink, is given in the technical specifications (see [Technical Information LV 1 T](#) or [our Mall](#)) and the product data sheets.

Despite the rugged power semiconductors that are used, solid-state switching devices respond more sensitively to short-circuits in the load feeder. Consequently, special precautions have to be taken against destruction, depending on the type of design.

Siemens generally recommends using SITOP semiconductor protection fuses. These fuses also provide protection against destruction in the event of a short-circuit even when the solid-state contactors and solid-state relays are fully utilized.

Alternatively, if there is lower loading, protection can also be provided by standard fuses or miniature circuit breakers. This protection is achieved by overdimensioning the solid-state switching devices accordingly. The technical specifications and the product data sheets contain details both about the solid-state fuse protection itself and about use of the devices with conventional protection equipment.

Semiconductor motor and reversing contactors can be easily combined with the 3RV motor starter protectors and 3RB2 overload relay from the SIRIUS modular system. Thus, fuseless and fuse motor feeders can be designed easily and in a space-saving manner.

The solid-state switching devices for resistive loads are suitable for interference-free operation in industrial networks without further measures. If they are used in public networks, it may be necessary for conducted interference to be reduced by means of filters. This does not include the special solid-state contactors of type 3RF23...-CA.. "Low Noise". These comply with the class B limit values up to a rated current of 16 A. If other versions are used, and at currents of over 16 A, standard filters can be used in order to comply with the limit values. The decisive factors when it comes to selecting the filters are essentially the current loading and the other parameters (operational voltage, design type, etc.) in the load feeder.

Suitable filters can be ordered from EPCOS AG.

You can find more information on the Internet at:

<http://www.epcos.com>

Solid-State Switching Devices

Solid-State Relays

22.5 mm semiconductor relays
single phase selection

Selection and ordering data



3RF21 20-1AA02



3RF21 20-2AA02



3RF21 20-3AA02

Type current ¹⁾	Maximum achievable power for type current and $U_e =$ 115 V 230 V 400 V			Screw connection ²⁾	Spring-loaded connection ³⁾	Ring cable connection	Std. Pack Qty	Weight per pack approx.
A	kW	kW	kW	Order No.	Order No.	Order No.		kg
Zero-point switching, rated operational voltage $U_e = 24$ V to 230 V								
20	2.3	4.6	-	3RF21 20-1AA□2	3RF21 20-2AA□2	3RF21 20-3AA□2	1 unit	0.075
30	3.5	6.9	-	3RF21 30-1AA□2	-	-	1 unit	0.075
50	5.8	11.5	-	3RF21 50-1AA□2	3RF21 50-2AA□2	3RF21 50-3AA□2	1 unit	0.075
70	8.1	16.1	-	3RF21 70-1AA□2	-	-	1 unit	0.075
90	10.4	20.7	-	3RF21 90-1AA□2	3RF21 90-2AA□2	3RF21 90-3AA□2	1 unit	0.075
Zero-point switching, rated operational voltage $U_e = 24$ V to 230 V, control DC 4 ... 30 V								
20	2.3	4.6	-	3RF21 20-1AA42	3RF21 20-2AA42	-	1 unit	0.075
30	3.5	6.9	-	3RF21 30-1AA42	-	-	1 unit	0.075
Zero-point switching, rated operational voltage $U_e = 48$ V to 460 V								
20	-	4.6	8	3RF21 20-1AA□4	3RF21 20-2AA□4	3RF21 20-3AA□4	1 unit	0.075
30	-	6.9	12	3RF21 30-1AA□4	-	-	1 unit	0.075
50	-	11.5	20	3RF21 50-1AA□4	3RF21 50-2AA□4 ⁴⁾	3RF21 50-3AA□4	1 unit	0.075
70	-	16.1	28	3RF21 70-1AA□4	-	-	1 unit	0.075
90	-	20.7	36	3RF21 90-1AA□4	3RF21 90-2AA□4	3RF21 90-3AA□4	1 unit	0.075
Zero-point switching, rated operational voltage $U_e = 48$ V to 600 V, control DC 4 ... 30 V								
20	-	4.6	8	3RF21 20-1AA45	3RF21 20-2AA45	-	1 unit	0.075
30	-	6.9	12	3RF21 30-1AA45	-	-	1 unit	0.075
50	-	11.5	20	3RF21 50-1AA45	-	-	1 unit	0.075
70	-	16.1	28	3RF21 70-1AA45	-	-	1 unit	0.075
90	-	20.7	36	3RF21 90-1AA45	-	3RF21 90-3AA44	1 unit	0.075
Zero-point switching, rated operational voltage $U_e = 48$ V to 600 V, blocking voltage 1600 V								
30	-	-	12	3RF21 30-1AA□6	-	-	1 unit	0.075
50	-	-	20	3RF21 50-1AA□6	3RF21 50-2AA□6	3RF21 50-3AA□6	1 unit	0.075
70	-	-	28	3RF21 70-1AA□6	-	-	1 unit	0.075
90	-	-	36	3RF21 90-1AA□6	3RF21 90-2AA□6	3RF21 90-3AA□6	1 unit	0.075
Zero-point switching, rated operational voltage $U_e = 48$ V to 600 V, control 24 V DC low power								
70	-	-	28	3RF21 70-1AA05-0KN0	-	-	1 unit	0.075
Zero-point switching, rated operational voltage $U_e = 24$ V to 230 V, control 110 V to 230 V								
50	-	-	-	3RF21 50-1BA22	-	-	1 unit	0.075
Instantaneous switching, rated operational voltage $U_e = 48$ V to 460 V, control 24 V DC acc. to EN 61131-2								
20	-	-	-	3RF21 20-1BA04	-	-	1 unit	0.075
30	-	-	-	3RF21 30-1BA04	-	-	1 unit	0.075
50	-	-	-	3RF21 50-1BA04	-	-	1 unit	0.075
70	-	-	-	3RF21 70-1BA04	-	-	1 unit	0.075
90	-	-	-	3RF21 90-1BA04	-	-	1 unit	0.075
Zero-point switching, rated operational voltage $U_e = 48$ V to 600 V, control 24 V DC acc. to EN 61131-2, blocking voltage 1600 V								
50	-	-	-	3RF21 50-1BA06	-	-	1 unit	0.075
Low noise³⁾ - zero-point switching, rated operational voltage $U_e = 48$ V to 460 V, control 24 V DC acc. to EN 61131-2								
70	-	-	-	3RF21 70-1CA04	-	-	1 unit	0.075
Order No. extension for rated control supply voltage U_s								
DC 24 V acc. to EN 61131-2				0	0	0		
AC 110 V... 230 V				2	2	2		

Other rated control supply voltages on request.

1) The type current provides information about the performance of the semiconductor relay. The actual permitted operational current I_b can be smaller depending on the connection method and cooling conditions.

2) Please note that this version can only be used for a rated current of up to 50 A and a conductor cross section of 10 mm².

3) Please note that this version can only be used for a rated current of up to 20 A and a conductor cross section of 2.5 mm². See page 19/21 of Industrial controls catalog for mm² to AWG conversion chart.

4) 50 A version with 24 AC/DC control - 3RF21 50-2AA14.

Note: See page 19/21 of Industrial Controls catalog for mm² to AWG conversion chart.

Fused design with semiconductor protection
(similar to type of coordination "2")¹⁾

The semiconductor protection for the SIRIUS SC control gear can be used with different protective devices. This allows protection by means of LV HRC fuses of operational class gL/gG or supplementary protectors. The table on page 7/21 lists the maximum permissible fuses for each SIRIUS SC controlgear.

If a fuse is used with a higher rated current than specified, semiconductor protection is no longer guaranteed. However, smaller fuses with a lower rated current for the load can be used without problems.

For protective devices with operational class gL/gG and for SITOR full range fuses 3NE1, the minimum cross-sections for the conductor to be connected must be taken into account.

Selection and ordering data

3RF20 20-1AA02

Type current ¹⁾	Maximum achievable power for type current and $U_e =$			Screw connection ²⁾	Spring-loaded connection ³⁾	Ring cable connection	Std. Pack Qty	Weight per pack approx.
	115 V	230 V	400 V					
A	kW	kW	kW	Order No.	Order No.	Order No.		kg
Zero-point switching, rated operational voltage $U_e = 24$ V to 230 V								
20	2.3	4.6	-	3RF20 20-1AA□2	-	-	1 unit	0.085
30	3.5	6.9	-	3RF20 30-1AA□2	-	-	1 unit	0.085
50	5.8	11.5	-	3RF20 50-1AA□2	-	-	1 unit	0.085
70	8.1	16.1	-	3RF20 70-1AA□2	-	-	1 unit	0.085
88	10.4	20.7	-	3RF20 90-1AA□2	-	-	1 unit	0.085
Zero-point switching, rated operational voltage $U_e = 24$ V to 230 V, control DC 4 ... 30 V								
20	-	-	-	-	3RF21 20-2AA42	-	1 unit	0.075
Zero-point switching, rated operational voltage $U_e = 48$ V to 460 V								
20	-	4.6	8	3RF20 20-1AA□4	-	-	1 unit	0.085
30	-	6.9	12	3RF20 30-1AA□4	-	-	1 unit	0.085
50	-	11.5	20	3RF20 50-1AA□4	-	-	1 unit	0.085
70	-	16.1	28	3RF20 70-1AA□4	-	-	1 unit	0.085
88	-	20.7	36	3RF20 90-1AA□4	-	-	1 unit	0.085
Zero-point switching, rated operational voltage $U_e = 24$ V to 230 V, control DC 4 ... 30 V								
20	-	-	-	3RF20 20-1AA42	3RF21 20-2AA42	-	1 unit	0.085
30	-	-	-	3RF20 30-1AA42	-	-	1 unit	0.085
Zero-point switching, rated operational voltage $U_e = 48$ V to 600 V, control DC 4 ... 30 V								
20	-	4.6	8	3RF20 20-1AA45	-	-	1 unit	0.085
50	-	11.5	20	3RF20 50-1AA45	-	-	1 unit	0.085
70	-	16.1	28	3RF20 70-1AA45	-	-	1 unit	0.085
90	-	20.7	36	3RF20 90-1AA45	-	-	1 unit	0.085
Zero-point switching, rated operational voltage $U_e = 48$ V to 600 V, blocking voltage 1600 V								
30	-	-	12	3RF20 30-1AA□6	-	-	1 unit	0.085
50	-	-	20	3RF20 50-1AA□6	-	-	1 unit	0.085
70	-	-	28	3RF20 70-1AA□6	-	-	1 unit	0.085
88	-	-	36	3RF20 90-1AA□6	-	-	1 unit	0.085
Zero-point switching, rated operational voltage $U_e = 48$ V to 460 V, control DC 4 ... 30 V switching								
50	-	-	-	3RF20 50-1BA44	-	-	1 unit	0.085
Instantaneous switching, rated operational voltage $U_e = 48$ V to 460 V, control 24 V DC acc. to EN 61131-2								
30	-	-	-	3RF20 30-1BA04	-	-	1 unit	0.085
Order No. extension for rated control supply voltage U_s								
DC 24 V acc. to EN 61131-2				0	0	0		
AC 110 V... 230 V				2	2	2		

Other rated control supply voltages on request.

1) The type current provides information about the performance of the semiconductor relay. The actual permitted operational current I_o can be smaller depending on the connection method and cooling conditions.

2) Please note that this version can only be used for a rated current of up to 50 A and a conductor cross section of 10mm².

3) Screw terminals and spring terminals (control current side).

Note: For mm² to AWG conversion chart see Industrial Controls catalog page 19/21.

Solid-State Switching Devices

Solid-State Relays

3RF22 solid-state relays, 3-phase, 45 mm

Selection and ordering data

Selecting solid-state relays

When selecting solid-state relays, in addition to information about the power system, the load and the ambient conditions it is also necessary to know details of the planned design. The solid-state relays can only conform to their specific technical specifications if they are mounted with appropriate care on an adequately dimensioned heat sink. The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select the relay design and choose a solid-state relay with higher rated current than the load
- Determine the thermal resistance of the proposed heat sink
- Check the correct relay size with the aid of the diagrams.

Type current ¹⁾	Rated control supply voltage	Screw terminal ²⁾	Weight per pack approx.
A	V	Order No.	kg

Zero-point switching Rated operational voltage U_e 48 V ... 600 V



3RF22 30-1AB45

Two-phase controlled

30	4 ... 30 V DC
55	

3RF22 30-1AB□5	0.150
3RF22 55-1AB□5	0.150

Three-phase controlled

30	4 ... 30 V DC
55	

3RF22 30-1AC□5	0.150
3RF22 55-1AC□5	0.150

110 V AC
4 ... 30 V DC

3
4

Type current ¹⁾	Rated control supply voltage	Spring-loaded terminals ³⁾	Weight per pack approx.
A	V	Order No.	kg

Zero-point switching Rated operational voltage U_e 48 V ... 600 V



3RF22 30-2AB45

Two-phase controlled

30	4 ... 30 V DC
55	

3RF22 30-2AB45	0.150
3RF22 55-2AB45	0.150

Three-phase controlled

30	4 ... 30 V DC
55	

3RF22 30-2AC45	0.150
3RF22 55-2AC45	0.150

Type current ¹⁾	Rated control supply voltage	Ring terminal end connection	Weight per pack approx.
A	V	Order No.	kg

Zero-point switching Rated operational voltage U_e 48 V ... 600 V



3RF22 30-3AB45

Two-phase controlled

30	4 ... 30 V DC
55	

3RF22 30-3AB45	0.150
3RF22 55-3AB45	0.150

Three-phase controlled

30	4 ... 30 V DC
55	

3RF22 30-3AC45	0.150
3RF22 55-3AC45	0.150

1) The type current provides information about the performance of the solid-state relay. The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

2) Please note that the version with an M4 screw terminal can only be used for a rated current of up to approx. 50 A and a conductor cross-section of 10 mm².

3) Please note that this version can only be used for a rated current of up to approx. 20 A and a conductor cross-section of 2.5 mm².

Overview

Solid-state contactors

The complete units consist of a solid-state relay plus optimized heat sink, and are therefore ready to use. They offer defined rated currents to make selection as easy as possible. Depending on the version, current strengths of up to 88 A are achieved. Like all of our solid-state switching devices, one of their particular advantages is their compact and space-saving design.

With their insulated mounting foot they can easily be snapped onto a standard mounting rail, or they can be mounted on support plates with fixing screws. This insulation enables them to be used in circuits with protective extra-low voltage (PELV) or safety extra-low voltage (SELV) in building management systems. For other applications, such as for extended personal safety, the heat sink can be grounded through a screw terminal.

The solid-state contactors are available in 2 different versions:

- 3RF23 single-phase solid-state contactors,
- 3RF24 three -phase solid-state contactors

Single-phase versions

The 3RF23 solid-state contactors can be expanded with various function modules to adapt them to individual applications.

Version for resistive loads, "zero-point switching"

This standard version is often used for switching space heaters on and off.

Version for inductive loads, "instantaneous switching"

In this version the solid-state contactor is specifically matched to inductive loads. Whether it is a matter of frequent actuation of the valves in a filling plant or starting and stopping small operating mechanisms in packet distribution systems, operation is carried out safely and noiselessly.

Special "Low noise" version

Thanks to a special control circuit, this special version can be used in public networks up to 16 A without any additional measures such as interference suppressor filters. As a result it conforms to limit value curve class B according to EN 60947-4-3 in terms of emitted interference.

Special "Short-circuit-proof" version

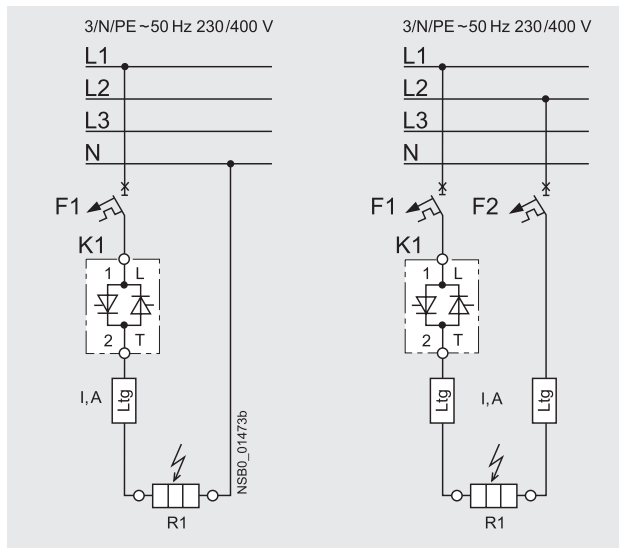
Skilful matching of the power semiconductor with the performance capacity of the solid-state contactor means that "short-circuit strength" can be achieved with a standard miniature circuit breaker. In combination with a B-type MCB or a conventional line protection fuse, the result is a short-circuit resistant feeder.

In order to achieve problem-free short-circuit protection by means of miniature circuit breakers, however, certain boundary conditions must be observed. As the magnitude and duration of the short-circuit current are determined not only by the short-circuit breaking response of the miniature circuit breaker but also the properties of the wiring system, such as the internal resistance of the input to the network and damping by controls and cables, particular attention must also be paid to these parameters. The necessary cable lengths are therefore shown for the main factor, the line resistance, in the table above right.

The following miniature circuit breakers with a type B tripping characteristic and 10 kA or 6 kA breaking capacity protect the 3RF23...DA.. solid-state contactors in the event of short-circuits on the load and the specified conductor cross-sections and lengths:

Rated current of the miniature circuit breaker	Example Type ¹⁾	Max. conductor cross-section	Minimum cable length from contactor to load
6 A	5SY4 106-6, 5SX2 106-6	1 mm ²	5 m
10 A	5SY4 110-6, 5SX2 110-6	1.5 mm ²	8 m
16 A	5SY4 116-6, 5SX2 116-6	1.5 mm ²	12 m
16 A	5SY4 116-6, 5SX2 116-6	2.5 mm ²	20 m
20 A	5SY4 120-6, 5SX2 120-6	2.5 mm ²	20 m
25 A	5SY4 125-6, 5SX2 125-6	2.5 mm ²	26 m

1) The miniature circuit breakers can be used up to a maximum rated voltage of 480 V!



The setup and installation above can also be used for the solid-state relays with a I^2t value of at least 6600 A²s.

Three-phase versions

The three-phase solid-state contactors for resistive loads up to 50 A are available with

- two-phase control (suitable in particular for circuits without connection to the neutral conductor) and
- three-phase control (suitable for star circuits with connection to the neutral conductor or for applications in which the system requires all phases to be switched).

The converter function module can be snapped onto both versions for the simple power control of AC loads by means of analog signals.

- Check the correct contactor size with the aid of the rated current diagram, taking account of the design conditions.

Solid-State Switching Devices

Solid-State Relays

SIRIUS SC semiconductor contactors single phase selection

Selection and ordering data

Selecting solid-state contactors

The semiconductor contactors are selected on the basis of details of the power system, the load and the ambient conditions. As the semiconductor contactors are already equipped with an optimally matched heat sink, the selection process is considerably simpler than that for semiconductor relays.

The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select a semiconductor contactor with the same or higher rated current than the load
- Check the correct contactor size with the aid of the rated current diagram, taking account of the design conditions



Type current 1)	Maximum achievable power for I_{max} and $U_e =$			Screw connection	Spring-loaded connection	Ring cable connection	Std. Pack Qty	Weight per pack approx.
I_{max}	115 V	230 V	400 V	Order No.	Order No.	Order No.		kg
A	kW	kW	kW					
Zero-point switching, rated operational voltage $U_e = 24$ V to 230 V								
10.5	1.2	2.4	-	3RF23 10-1AA□2	3RF23 10-2AA□2	3RF23 10-3AA□2	1 unit	0.136
20	2.3	4.6	-	3RF23 20-1AA□2	3RF23 20-2AA□2	3RF23 20-3AA□2	1 unit	0.204
30	3.5	6.9	-	3RF23 30-1AA□2	-	3RF23 30-3AA□2	1 unit	0.354
40	4.6	9.2	-	3RF23 40-1AA□2	-	3RF23 40-3AA□2	1 unit	0.496
50	6	12	-	3RF23 50-1AA□2	-	3RF23 50-3AA□2	1 unit	0.496
70	8	16	-	-	-	3RF23 70-3AA□2	1 unit	0.944
88	10	20	-	-	-	3RF23 90-3AA□2	1 unit	2.600
Zero-point switching, rated operational voltage $U_e = 24$ V to 230 V, control 24 V DC acc. to EN 61131-2³⁾								
50	-	-	-	3RF20 50-4AA02	-	-	1 unit	0.085
Zero-point switching, rated operational voltage $U_e = 24$ V to 230 V, control 24 V DC low power								
20	-	-	-	3RF23 20-1AA02-0KN0	-	-	1 unit	0.240
Zero-point switching, rated operational voltage $U_e = 48$ V to 460 V								
10.5	-	2.4	4.2	3RF23 10-1AA□4	3RF23 10-2AA□4	3RF23 10-3AA□4	1 unit	0.136
20	-	4.6	8	3RF23 20-1AA□4	3RF23 20-2AA□4	3RF23 20-3AA□4	1 unit	0.204
30	-	6.9	12	3RF23 30-1AA□4	-	3RF23 30-3AA□4	1 unit	0.354
40	-	9.2	16	3RF23 40-1AA□4	-	3RF23 40-3AA□4	1 unit	0.496
50	-	12	20	3RF23 50-1AA□4	-	3RF23 50-3AA□4	1 unit	0.496
70	-	16	28	-	-	3RF23 70-3AA□4	1 unit	0.944
88	-	20	35	-	-	3RF23 90-3AA□4	1 unit	2.600
Zero-point switching, rated operational voltage $U_e = 24$ V to 230 V, control 24 V AC/DC								
10.5	-	-	-	3RF23 10-1AA12	-	-	1 unit	0.165
Zero-point switching, rated operational voltage $U_e = 48$ V to 460 V, control 24 V DC low power								
50	-	-	-	3RF23 10-1AA04-0KN0	-	-	1 unit	0.165
Zero-point switching, rated operational voltage $U_e = 48$ V to 460 V, control 24 V AC/DC								
10.5	-	-	-	3RF23 10-1AA14	-	-	1 unit	0.165
20	-	-	-	3RF23 20-1AA14	-	-	1 unit	0.240
30	-	-	-	3RF23 30-1AA14	-	-	1 unit	0.400
40	-	-	-	3RF23 40-1AA14	-	-	1 unit	0.550
50	-	-	-	3RF23 50-1AA14	-	-	1 unit	0.550
Zero-point switching, rated operational voltage $U_e = 48$ V to 600 V, control DC 4 ... 30 V								
10.5	-	2.4	4.2	3RF23 10-1AA45	-	-	1 unit	0.135
20	-	4.6	8	3RF23 20-1AA45	-	-	1 unit	0.204
30	-	6.9	12	3RF23 30-1AA45	-	-	1 unit	0.354
40	-	9.2	16	3RF23 40-1AA45	-	3RF23 40-3AA45	1 unit	0.496
50	-	12	20	3RF23 50-1AA45	-	-	1 unit	0.496
70	-	16	26	-	-	3RF23 70-3AA45	1 unit	0.944
90	-	20	35	-	-	3RF23 90-3AA45	1 unit	2.600
Zero-point switching, rated operational voltage $U_e = 48$ V to 460 V, control 4 V ... 30 V DC								
10.5	-	-	-	3RF23 10-1AA44	-	-	1 unit	0.165
20	-	-	-	3RF23 20-1AA44	-	3RF23 20-3AA44	1 unit	0.240
30	-	-	-	3RF23 30-1AA44	-	3RF23 30-3AA44	1 unit	0.400
50	-	-	-	3RF23 50-1AA44	-	3RF23 50-3AA44	1 unit	0.400
Zero-point switching, rated operational voltage $U_e = 48$ V to 600 V, blocking voltage 1600 V								
10.5	-	-	4.2	3RF23 10-1AA□6	3RF23 10-2AA□6	3RF23 10-3AA□6	1 unit	0.136
20	-	-	8	3RF23 20-1AA□6	3RF23 20-2AA□6	3RF23 20-3AA□6	1 unit	0.204
30	-	-	12	3RF23 30-1AA□6	-	3RF23 30-3AA□6	1 unit	0.354
40	-	-	16	3RF23 40-1AA□6	-	3RF23 40-3AA□6	1 unit	0.496
50	-	-	20	3RF23 50-1AA□6	-	3RF23 50-3AA□6	1 unit	0.496
70	-	-	28	-	-	3RF23 70-3AA□6	1 unit	0.944
88	-	-	35	-	-	3RF23 90-3AA□6	1 unit	2.600

Order No. extension for
rated control supply voltage U_s
DC 24 V acc. to EN 61131-2
AC 110 V ... 230 V

0
2

0
2

0
2


Other rated control supply voltages on request.

1) The type current provides information about the performance of the semiconductor contactor. The actual permitted operational current I_b can be smaller depending on the connection method and start-up conditions. Derating acc. to curves from page 7/45, 7/46, 7/47.

Type current ¹⁾ I_{max}	Maximum achievable power for I_{max} and $U_e =$			Screw connection	Spring-loaded connection	Ring cable connection	Std. Pack Qty	Weight per pack approx.
	115 V	230 V	400 V	Order No.	Order No.	Order No.		kg
A	kW	kW	kW					
Instantaneous switching, rated operational voltage $U_e = 24$ V to 230 V								
10.5	1.2	2.4	-	3RF23 10-1BA□2	-	-	1 unit	0.136
20	2.3	4.6	-	3RF23 20-1BA□2	-	-	1 unit	0.204
30	3.5	6.9	-	3RF23 30-1BA□2	-	-	1 unit	0.354
40	4.6	9.2	-	3RF23 40-1BA□2	-	-	1 unit	0.496
50	6	12	-	3RF23 50-1BA□2	-	-	1 unit	0.496
70	8	16	-	3RF23 70-1BA□2	-	3RF23 70-3BA□2	1 unit	0.944
88	10	20	-	3RF23 90-1BA□2	-	3RF23 90-3BA□2	1 unit	2.600
Instantaneous switching, rated operational voltage $U_e = 48$ V to 460 V								
10.5	-	2.4	4.2	3RF23 10-1BA□4	-	-	1 unit	0.136
20	-	4.6	8	3RF23 20-1BA□4	-	-	1 unit	0.204
30	-	6.9	12	3RF23 30-1BA□4	-	-	1 unit	0.354
40	-	9.2	16	3RF23 40-1BA□4	-	-	1 unit	0.496
50	-	12	20	3RF23 50-1BA□4	-	-	1 unit	0.496
70	-	16	28	3RF23 70-1BA□4	-	3RF23 70-3BA□4	1 unit	0.944
88	-	20	35	3RF23 90-1BA□4	-	3RF23 90-3BA□4	1 unit	2.600
Zero-point switching, rated operational voltage $U_e = 48$ V to 600 V, control 110 V to 230 V								
30	-	-	-	3RF23 30-1AA25	-	-	1 unit	0.400
Instantaneous switching, rated operational voltage $U_e = 48$ V to 600 V, blocking voltage 1600 V								
10.5	-	-	4.2	3RF23 10-1BA□6	-	-	1 unit	0.136
20	-	-	8	3RF23 20-1BA□6	-	-	1 unit	0.204
30	-	-	12	3RF23 30-1BA□6	-	-	1 unit	0.354
40	-	-	16	3RF23 40-1BA□6	-	-	1 unit	0.496
50	-	-	20	3RF23 50-1BA□6	-	-	1 unit	0.496
70	-	-	28	3RF23 70-1BA□6	-	3RF23 70-3BA□6	1 unit	0.944
88	-	-	35	3RF23 90-1BA□6	-	3RF23 90-3BA□6	1 unit	2.600
Low noise, zero-point switching, rated operational voltage $U_e = 24$ V to 230 V								
20	2.3	4.6	-	3RF23 20-1CA□2	3RF23 20-2CA□2	-	1 unit	0.204
30	-	-	-	3RF23 30-1CA□2	-	-	1 unit	0.204
Low noise, zero-point switching, rated operational voltage $U_e = 48$ V to 460 V								
20	-	4.6	8	3RF23 20-1CA□4	3RF23 20-2CA□4	-	1 unit	0.204
Instantaneous switching, rated operational voltage $U_e = 48$ V to 460 V, control DC 4 ... 30 V switching								
20	-	-	-	3RF23 20-1BA44	-	-	1 unit	0.240
30	-	-	-	3RF23 30-1BA44	-	-	1 unit	0.400
50	-	-	-	3RF23 50-1BA44	-	-	1 unit	0.550
Short-circuit resistant with B-automatic device, zero-point switching, rated operational voltage $U_e = 24$ V to 230 V								
20	2.3	4.6	-	3RF23 20-1DA□2	3RF23 20-2DA22	3RF23 20-3DA□2	1 unit	0.204
Short-circuit resistant with B-automatic device, zero-point switching, rated operational voltage $U_e = 48$ V to 460 V								
20	-	4.6	8	3RF23 20-1DA□4	3RF23 20-2DA24	3RF23 20-3DA□4	1 unit	0.204
Low noise, zero-point switching, rated operational voltage $U_e = 48$ V to 460 V, control 4 V to 30 V DC								
70	-	-	28	3RF21 70-1CA04	-	-	1 unit	0.240
Order No. extension for rated control supply voltage U_c								
DC 24 V acc. to EN 61131-2				0	0	0		
AC 110 V ... 230 V				2	2	2		

Other rated control supply voltages on request.

1) The type current provides information about the performance of the semiconductor contactor. The actual permitted operational current I_b can be smaller depending on the connection method and start-up conditions. Derating acc. to curves from page 7/45, 7/46, 7/47.

Version	Order No.	Std. Pack Qty	Weight per pack approx.
			kg
Accessories			
	Terminal cover for 3RF21 semiconductor relays and 3RF23 semiconductor contactors with ring terminal end (after simple adaptation, this terminal cover can also be used for screw connection).	3RF29 00-3PA88	10 units 0.010




3RF29 00-3PA88

Solid-State Switching Devices

Solid-State Contactors

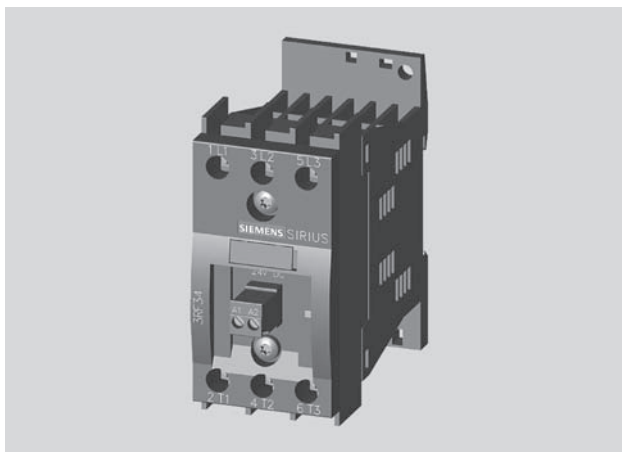
3RF24 solid-state contactors, 3-phase

Selection and ordering data

Type current ¹⁾ <i>I</i> _{max}	Rated control supply voltage <i>U</i> _s	DT	Screw terminals		Std. Pack Qty	Weight per pack approx.
A	V		Order No.	List Price \$ per PU		kg
Zero-point switching Rated operational voltage <i>U</i> _e 48 V ... 600 V						
<i>Two-phase controlled</i>						
 3RF24 20-1AB45	10.5 20 30 40 50	4 ... 30 DC	A	3RF24 10-1AB45	1 unit	0.320
			B	3RF24 20-1AB45	1 unit	0.400
			B	3RF24 30-1AB45	1 unit	0.540
			B	3RF24 40-1AB45	1 unit	0.800
			B	3RF24 50-1AB45	1 unit	1.100
	10.5 20 30 40 50	110 AC	A	3RF24 10-1AB35	1 unit	0.320
			B	3RF24 20-1AB35	1 unit	0.400
			B	3RF24 30-1AB35	1 unit	0.540
			B	3RF24 40-1AB35	1 unit	0.800
			B	3RF24 50-1AB35	1 unit	1.100
	10.5 20 30 40 50	230 AC	B	3RF24 10-1AB55	1 unit	0.320
			B	3RF24 20-1AB55	1 unit	0.400
			B	3RF24 30-1AB55	1 unit	0.540
			B	3RF24 40-1AB55	1 unit	0.800
			B	3RF24 50-1AB55	1 unit	1.100
<i>Three-phase controlled</i>						
 3RF24 10-1AC45	10.5 20 30 40 50	4 ... 30 DC	B	3RF24 10-1AC45	1 unit	0.320
			B	3RF24 20-1AC45	1 unit	0.540
			A	3RF24 30-1AC45	1 unit	0.800
			B	3RF24 40-1AC45	1 unit	1.100
			B	3RF24 50-1AC45	1 unit	1.850
	10.5 20 30 40 50	110 AC	B	3RF24 10-1AC35	1 unit	0.320
			B	3RF24 20-1AC35	1 unit	0.540
			A	3RF24 30-1AC35	1 unit	0.800
			B	3RF24 40-1AC35	1 unit	1.100
			B	3RF24 50-1AC35	1 unit	1.850
	10.5 20 30 40 50	230 AC	B	3RF24 10-1AC55	1 unit	0.320
			B	3RF24 20-1AC55	1 unit	0.540
			B	3RF24 30-1AC55	1 unit	0.800
			B	3RF24 40-1AC55	1 unit	1.100
			B	3RF24 50-1AC55	1 unit	1.850

1) The type current provides information about the performance capacity of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and start-up conditions. For derating, see Technical Information on page 7/55, Characteristic Curves.

Overview



Solid-state contactor for direct-on-line starting

The solid-state contactors for switching motors are intended for frequently switching on and off three-phase current operating mechanisms up to 7.5 kW and reversing up to 3.0 kW. The devices are constructed with complete insulation and can be mounted directly on SIRIUS motor starter protectors, overload relays and current monitoring relays, resulting in a very simple integration into motor feeders.

These three-phase solid-state contactors are equipped with a two-phase control which is particularly suitable for typical motor current circuits without connecting to the neutral conductor.

Important features:

- Insulated enclosure with integrated heat sink
- Degree of protection IP20
- Integrated mounting foot to snap on a standard mounting rail or for assembly onto a support plate
- Variety of connection methods
- Plug-in control connection
- Display via LEDs
- Wide voltage range for AC control supply voltage

Switching functions

The solid-state contactors for switching motors are “instantaneous switching” because this method is particularly suited for inductive loads. By distributing the ON point over the entire sine curve of the mains voltage, disturbances are reduced to a minimum

Selecting solid-state contactors

The solid-state contactors are selected on the basis of details of the network, the load and the ambient conditions.

The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select a solid-state contactor with the same or higher rated current than the load
- Testing the maximum permissible switching frequency based on the characteristic curves (see “Technical Information”). To do this, the starting current, the starting time and the motor loaded in the operating phase must be known.
- If the permissible switching frequency is under the desired frequency, it is possible to achieve an increase only by overdimensioning the motor and the solid-state contactor!

Benefits

- Units with integrated heat sink, “ready to use”
- Compact and space-saving design
- Reversing contactors with integrated interlocking

Application

Use in load feeders

There is no typical design of a load feeder with solid-state relays or solid-state contactors; instead, the great variety of connection methods and control voltages offers universal application opportunities. SIRIUS solid-state relays and solid-state contactors can be installed in fuseless or fused feeders, as required.

Standards and approvals

- IEC 60947-4-2
- UL 508, CSA for North America¹⁾
- CE marking for Europe
- C-Tick approval for Australia
- CCC approval for China

¹⁾ Please note: Use overvoltage protection device; max. cut-off-voltage 6000 V; min. energy handling capability 100 J.


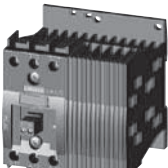
Solid-State Switching Devices

Solid-State Contactors for Switching Motors

3RF34 solid-state contactors, 3-phase

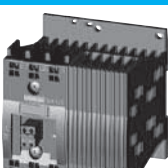
Selection and ordering data

Motor contactors · Instantaneous switching · Two-phase controlled

	Rated operational current I_e	Rated power at I_e and U_e	Rated control supply voltage U_s	DT	Screw terminals		Std. Pack Qty
					Configurator		
	A	400 V kW	V		Order No.	Price per PU	
Rated operational voltage U_e							
48 ... 480 V AC							
	5.2	2.2	24 DC acc. to IEC 61131-2	A	3RF34 05-1BB04		1 unit
	9.2	4.0		B	3RF34 10-1BB04		1 unit
	12.5	5.5		B	3RF34 12-1BB04		1 unit
	16	7.5		B	3RF34 16-1BB04		1 unit
	5.2	2.2	110 ... 230 AC	B	3RF34 05-1BB24		1 unit
	9.2	4.0		B	3RF34 10-1BB24		1 unit
	12.5	5.5		B	3RF34 12-1BB24		1 unit
	16	7.5		B	3RF34 16-1BB24		1 unit
Rated operational voltage U_e							
48 ... 600 V AC, blocking voltage 1600 V							
	5.2	2.2	24 DC acc. to IEC 61131-2	B	3RF34 05-1BB06		1 unit
	9.2	4.0		B	3RF34 10-1BB06		1 unit
	12.5	5.5		B	3RF34 12-1BB06		1 unit
	16	7.5		B	3RF34 16-1BB06		1 unit
	5.2	2.2	110 ... 230 AC	B	3RF34 05-1BB26		1 unit
	9.2	4.0		B	3RF34 10-1BB26		1 unit
	12.5	5.5		B	3RF34 12-1BB26		1 unit
	16	7.5		B	3RF34 16-1BB26		1 unit

3RF34 05-1BB

3RF34 10-1BB

	Rated operational current I_e	Rated power at I_e and U_e	Rated control supply voltage U_s	DT	Spring-type terminals		Std. Pack Qty
					Configurator		
	A	400 V kW	V		Order No.	Price per PU	
Rated operational voltage U_e							
48 ... 480 V AC							
	5.2	2.2	24 DC acc. to IEC 61131-2	B	3RF34 05-2BB04		1 unit
	9.2	4.0		B	3RF34 10-2BB04		1 unit
	12.5	5.5		B	3RF34 12-2BB04		1 unit
	16	7.5		B	3RF34 16-2BB04		1 unit
	5.2	2.2	110 ... 230 AC	B	3RF34 05-2BB24		1 unit
	9.2	4.0		B	3RF34 10-2BB24		1 unit
	12.5	5.5		B	3RF34 12-2BB24		1 unit
	16	7.5		B	3RF34 16-2BB24		1 unit
Rated operational voltage U_e							
48 ... 600 V AC, blocking voltage 1600 V							
	5.2	2.2	24 DC acc. to IEC 61131-2	B	3RF34 05-2BB06		1 unit
	9.2	4.0		B	3RF34 10-2BB06		1 unit
	12.5	5.5		B	3RF34 12-2BB06		1 unit
	16	7.5		B	3RF34 16-2BB06		1 unit
	5.2	2.2	110 ... 230 AC	B	3RF34 05-2BB26		1 unit
	9.2	4.0		B	3RF34 10-2BB26		1 unit
	12.5	5.5		B	3RF34 12-2BB26		1 unit
	16	7.5		B	3RF34 16-2BB26		1 unit

3RF34 05-2BB

3RF34 10-2BB

For online configurator see www.siemens.com/sirius/configurators.


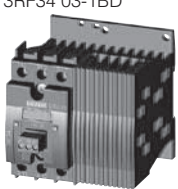
Solid-State Switching Devices

Solid-State Contactors for Switching Motors

3RF34 solid-state reversing contactors, 3-phase

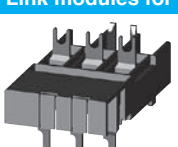

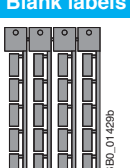
Selection and ordering data

Reversing contactors · Instantaneous switching · Two-phase controlled

Rated operational current I_e	Rated power at I_e and U_e	Rated control supply voltage U_s	DT	Screw terminals	Configurator	Std. Pack Qty
A	400 V kW	V		Order No.	Price per PU	
Rated operational voltage U_e 48 ... 480 V AC						
 3RF34 03-1BD	3.8	1.5	24 DC acc. to IEC 61131-2	B	3RF34 03-1BD04	1 unit
	5.4	2.2		B	3RF34 05-1BD04	1 unit
	7.4	3.0		B	3RF34 10-1BD04	1 unit
 3RF34 10-1BD	3.8	1.5	110 ... 230 AC	B	3RF34 03-1BD24	1 unit
	5.4	2.2		B	3RF34 05-1BD24	1 unit
	7.4	3.0		B	3RF34 10-1BD24	1 unit

For online configurator see www.siemens.com/sirius/configurators.

Accessories

Version	DT	Order No.	Price per PU	Std. Pack Qty
Link modules for solid-state contactor to motor starter protector				
 3RA29 21-1BA00		Link module between solid-state reversing contactor and motor starter protector with screw terminals For 3RV2 motor starter protectors size S00/S0	Screw terminals	1 unit
Link adapters for solid-state contactor to overload relay				
 3RF39 00-0QA88	A	Link adapters for direct mounting of 3RB3 overload relays or 3RR2 current monitoring relays to the solid-state contactor with screw terminals The adapter is snapped onto the enclosure of the 3RF34 contactor and receives the fixing hooks of the 3RB3 overload relays or the 3RR2 current monitoring relays for direct mounting.	3RF39 00-0QA88	1 unit
Blank labels				
 3SB19 00-1SB20	D	Unit labeling plates¹⁾ for SIRIUS devices 20 mm × 7 mm, pastel turquoise	3RT19 00-1SB20	340 units

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH

Solid-State Switching Devices

3RF29 Function Modules

Selection Tables

Overview

Function modules for SIRIUS 3RF2 solid-state switching devices

A great variety of applications demand an expanded range of functionality. With our function modules, these requirements can be met really easily. The modules are mounted simply by clicking them into place; straight away the necessary connections are made with the solid-state relay or contactor. The plug-in connection to control the solid-state switching devices can simply remain in use.

The following function modules are available:

- Converters
- Load monitoring
- Heating current monitoring
- Power controllers
- Power regulators

With the exception of the converter, the function modules can be used only with single-phase solid-state switching devices.

Recommended assignment of the function modules to the 3RF21 single-phase solid-state relays

Order No.	Accessories					
	Converters	Load monitoring Basic	Extended	Heating current monitoring	Power controllers ¹⁾	Power regulators ¹⁾
Type current = 20 A						
3RF21 20-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF21 20-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF21 20-1A.22	--	--	3RF29 20-0GA33	--	--	--
3RF21 20-1A.24	--	--	3RF29 20-0GA36	--	--	--
3RF21 20-1A.42	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF21 20-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF21 20-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF21 20-2A.02	3RF29 00-0EA18	--	--	--	--	--
3RF21 20-2A.04	3RF29 00-0EA18	--	--	--	--	--
3RF21 20-2A.22	--	--	--	--	--	--
3RF21 20-2A.24	--	--	--	--	--	--
3RF21 20-2A.42	3RF29 00-0EA18	--	--	--	--	--
3RF21 20-2A.45	3RF29 00-0EA18	--	--	--	--	--
3RF21 20-3A.02	3RF29 00-0EA18	--	3RF29 20-0GA13	--	--	3RF29 20-0HA13
3RF21 20-3A.04	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF21 20-3A.22	--	--	3RF29 20-0GA33	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF21 20-3A.24	--	--	3RF29 20-0GA36	--	3RF29 20-0KA16	3RF29 20-0HA16
Type current = 30 A						
3RF21 30-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF21 30-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 30-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 30-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 30-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 30-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 30-1A.42	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF21 30-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 30-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
Type current = 50 A						
3RF21 50-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF21 50-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 50-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 50-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 50-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-1B.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 50-2A.02	3RF29 00-0EA18	--	--	--	--	--
3RF21 50-2A.04	3RF29 00-0EA18	--	--	--	--	--
3RF21 50-2A.06	3RF29 00-0EA18	--	--	--	--	--
3RF21 50-2A.14	3RF29 00-0EA18	--	--	--	--	--
3RF21 50-2A.22	--	--	--	--	--	--
3RF21 50-2A.24	--	--	--	--	--	--
3RF21 50-2A.26	--	--	--	--	--	--
3RF21 50-3A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF21 50-3A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-3A.06	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 50-3A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 50-3A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 50-3A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36

1) The use of power controllers/regulators is also possible on zero-point switching versions for full-wave control mode. The generalized phase control mode is recommended only for the combination with instantaneous switching versions.

Solid-State Switching Devices

3RF29 Function Modules

Selection Tables

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Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers ¹⁾	Power regulators ¹⁾
		Basic	Extended			
Type current = 70 A						
3RF21 70-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF21 70-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 70-1A.05	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 70-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 70-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 70-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 70-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 70-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 70-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 70-1C.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
Type current = 90 A						
3RF21 90-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF21 90-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 90-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 90-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF21 90-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 90-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF21 90-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 90-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF21 90-2A.02	3RF29 00-0EA18	--	--	--	--	--
3RF21 90-2A.04	3RF29 00-0EA18	--	--	--	--	--
3RF21 90-2A.06	3RF29 00-0EA18	--	--	--	--	--
3RF21 90-2A.22	--	--	--	--	--	--
3RF21 90-2A.24	--	--	--	--	--	--
3RF21 90-2A.26	--	--	--	--	--	--
3RF21 90-3A.02	3RF29 00-0EA18	--	3RF29 90-0GA13	--	--	3RF29 90-0HA13
3RF21 90-3A.04	3RF29 00-0EA18	--	3RF29 90-0GA16	3RF29 32-0JA16	3RF29 90-0KA16	3RF29 90-0HA16
3RF21 90-3A.06	3RF29 00-0EA18	--	3RF29 90-0GA16	3RF29 32-0JA16	3RF29 90-0KA16	3RF29 90-0HA16
3RF21 90-3A.22	--	--	3RF29 90-0GA33	--	--	3RF29 90-0HA33
3RF21 90-3A.24	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF21 90-3A.26	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF21 90-3A.44	3RF29 00-0EA18	--	3RF29 90-0GA16	3RF29 32-0JA16	3RF29 90-0KA16	3RF29 90-0HA16

1) The use of power controllers/regulators is also possible on zero-point switching versions for full-wave control mode. The generalized phase control mode is recommended only for the combination with instantaneous switching versions.

Recommended assignment of the function modules to the 3RF22 three-phase solid-state relays

Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers	Power regulators
		Basic	Extended			
Type current up to 55 A						
3RF22 ..-1A...	3RF29 00-0EA18	--	--	--	--	--
3RF22 ..-2A...	3RF29 00-0EA18	--	--	--	--	--
3RF22 ..-3A...	3RF29 00-0EA18	--	--	--	--	--

Recommended assignment of the function modules to the 3RF23 single-phase solid-state contactors

Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers ¹⁾	Power regulators ¹⁾
		Basic	Extended			
Type current I_e = 10.5 A						
3RF23 10-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 10-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1A.12	3RF29 00-0EA18	--	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 10-1A.14	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1A.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 10-1A.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 10-1A.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 10-1A.44	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16

Solid-State Switching Devices

3RF29 Function Modules

Selection Tables

Order No.	Accessories					
	Converters	Load monitoring Basic	Extended	Heating current monitoring	Power controllers ¹⁾	Power regulators ¹⁾
Type current $I_e = 10.5 \text{ A}$						
3RF23 10-1B.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 10-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1B.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-1B.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 10-1B.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 10-1B.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 10-2A.02	3RF29 00-0EA18	--	--	--	--	--
3RF23 10-2A.04	3RF29 00-0EA18	--	--	--	--	--
3RF23 10-2A.06	3RF29 00-0EA18	--	--	--	--	--
3RF23 10-2A.22	--	--	--	--	--	--
3RF23 10-2A.24	--	--	--	--	--	--
3RF23 10-2A.26	--	--	--	--	--	--
3RF23 10-3A.02	3RF29 00-0EA18	--	3RF29 20-0GA13	3RF29 16-0JA13	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 10-3A.04	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-3A.06	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 10-3A.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 10-3A.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 10-3A.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
Type current $I_e = 20 \text{ A}$						
3RF23 20-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1A.14	3RF29 00-0EA18	--	3RF29 20-0GA16	--	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1A.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-1A.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1A.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1A.44	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1A.45	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1B.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1B.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1B.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-1B.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1B.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1B.44	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1C.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-1C.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1C.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-1C.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1C.44	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1D.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-1D.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-1D.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-1D.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-1D.44	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-2A.02	3RF29 00-0EA18	--	--	--	--	--
3RF23 20-2A.04	3RF29 00-0EA18	--	--	--	--	--
3RF23 20-2A.06	3RF29 00-0EA18	--	--	--	--	--
3RF23 20-2A.22	--	--	--	--	--	--
3RF23 20-2A.24	--	--	--	--	--	--
3RF23 20-2A.26	--	--	--	--	--	--
3RF23 20-2C.02	3RF29 00-0EA18	--	--	--	--	--
3RF23 20-2C.04	3RF29 00-0EA18	--	--	--	--	--
3RF23 20-2C.22	--	--	--	--	--	--
3RF23 20-2C.24	--	--	--	--	--	--
3RF23 20-2D.22	--	--	--	--	--	--
3RF23 20-2D.24	--	--	--	--	--	--
3RF23 20-3A.02	3RF29 00-0EA18	--	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-3A.04	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-3A.06	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-3A.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-3A.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-3A.26	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
3RF23 20-3A.44	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16

1) The use of power controllers/regulators is also possible on zero-point switching versions for full-wave control mode. The generalized phase control mode is recommended only for the combination with instantaneous switching versions.

Solid-State Switching Devices

3RF29 Function Modules

Selection Tables

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Order No.	Accessories					
	Converters	Load monitoring Basic	Extended	Heating current monitoring	Power controllers ¹⁾	Power regulators ¹⁾
Type current $I_e = 20\text{ A}$						
3RF23 20-3D.02	3RF29 00-0EA18	--	3RF29 20-0GA13	--	3RF29 20-0KA13	3RF29 20-0HA13
3RF23 20-3D.04	3RF29 00-0EA18	--	3RF29 20-0GA16	3RF29 32-0JA16	3RF29 20-0KA16	3RF29 20-0HA16
3RF23 20-3D.22	--	--	3RF29 20-0GA33	--	--	3RF29 20-0HA33
3RF23 20-3D.24	--	--	3RF29 20-0GA36	--	--	3RF29 20-0HA36
Type current $I_e = 30\text{ A}$						
3RF23 30-1A.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 30-1A.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1A.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1A.14	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 30-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-1A.25	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-1A.44	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1A.45	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1B.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 30-1B.04	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1B.06	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 30-1B.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-1B.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-1B.44	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-1C.02	3RF29 00-0EA18	3RF29 20-0FA08	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 30-1D.44	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-3A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 30-3A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-3A.066	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 30-3A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 30-3A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-3A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 30-3A.44	3RF29 00-0EA18	--	3RF29 50-0GA16	3RF29 32-0JA16	3RF29 50-0KA16	3RF29 50-0HA16
Type current $I_e = 40\text{ A}$						
3RF23 40-1A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 40-1A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1A.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1A.14	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 40-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-1A.45	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1B.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 40-1B.04	3RF29 00-0EA18	--	3RF29 50-0GA13	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1B.06	3RF29 00-0EA18	--	3RF29 50-0GA13	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 40-1B.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-1B.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-3A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 40-3A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-3A.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 40-3A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 40-3A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-3A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 40-3A.45	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
Type current $I_e = 50\text{ A}$						
3RF23 50-1A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 50-1A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-1A.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-1A.14	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-1A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 50-1A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-1A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-1A.45	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16

1) The use of power controllers/regulators is also possible on zero-point switching versions for full-wave control mode. The generalized phase control mode is recommended only for the combination with instantaneous switching versions.

Solid-State Switching Devices

3RF29 Function Modules

Selection Tables

Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers ¹⁾	Power regulators ¹⁾
		Basic	Extended			
Type current $I_e = 50\text{ A}$						
3RF23 50-1B.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 50-1B.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-1B.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 50-1B.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-1B.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-1B.44	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-3A.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 50-3A.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-3A.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 50-3A.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 50-3A.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-3A.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 50-3A.44	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
Type current $I_e = 70\text{ A}$						
3RF23 70-1B.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 70-1B.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 70-1B.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 70-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 70-1B.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 70-1B.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 70-3A.02	3RF29 00-0EA18	--	3RF29 90-0GA13	--	--	3RF29 90-0HA13
3RF23 70-3A.04	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 70-3A.06	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 70-3A.22	--	--	3RF29 90-0GA33	--	--	3RF29 90-0HA33
3RF23 70-3A.24	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 70-3A.26	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 70-3A.45	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 70-3B.02	3RF29 00-0EA18	--	3RF29 90-0GA13	--	--	3RF29 90-0HA13
3RF23 70-3B.04	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 70-3B.06	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 70-3B.22	--	--	3RF29 90-0GA33	--	--	3RF29 90-0HA33
3RF23 70-3B.24	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 70-3B.26	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
Type current $I_e = 90\text{ A}$						
3RF23 90-1B.02	3RF29 00-0EA18	--	3RF29 50-0GA13	--	--	3RF29 50-0HA13
3RF23 90-1B.04	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 90-1B.06	3RF29 00-0EA18	--	3RF29 50-0GA16	--	3RF29 50-0KA16	3RF29 50-0HA16
3RF23 90-1B.22	--	--	3RF29 50-0GA33	--	--	3RF29 50-0HA33
3RF23 90-1B.24	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 90-1B.26	--	--	3RF29 50-0GA36	--	--	3RF29 50-0HA36
3RF23 90-3A.02	3RF29 00-0EA18	--	3RF29 90-0GA13	--	--	3RF29 90-0HA13
3RF23 90-3A.04	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 90-3A.06	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 90-3A.22	--	--	3RF29 90-0GA33	--	--	3RF29 90-0HA33
3RF23 90-3A.24	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 90-3A.26	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 90-3A.45	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 90-3B.02	3RF29 00-0EA18	--	3RF29 90-0GA13	--	--	3RF29 90-0HA13
3RF23 90-3B.04	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 90-3B.06	3RF29 00-0EA18	--	3RF29 90-0GA16	--	3RF29 90-0KA16	3RF29 90-0HA16
3RF23 90-3B.22	--	--	3RF29 90-0GA33	--	--	3RF29 90-0HA33
3RF23 90-3B.24	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36
3RF23 90-3B.26	--	--	3RF29 90-0GA36	--	--	3RF29 90-0HA36

1) The use of power controllers/regulators is also possible on zero-point switching versions for full-wave control mode. The generalized phase control mode is recommended only for the combination with instantaneous switching versions.

Recommended assignment of the function modules to the 3RF24 three-phase solid-state contactors

Order No.	Accessories					
	Converters	Load monitoring		Heating current monitoring	Power controllers	Power regulators
		Basic	Extended			
Type current up to 50 A						
3RF24 ..-1..4.	3RF29 00-0EA18	--	--	--	--	--
3RF24 ..-2..4.	--	--	--	--	--	--
3RF24 ..-3..4.	3RF29 00-0EA18	--	--	--	--	--
3RF24 ..-...5.	--	--	--	--	--	--

Overview

Converter for SIRIUS SC semiconductor switching devices

This module is used to convert analog drive signals, such as those output from many temperature controllers, for example, into a pulse-width-modulated digital signal. The connected semiconductor contactors and relays can therefore regulate the output of a load as a percentage.

Area of application

The device is used for conversion from an analog input signal to an on/off ratio. The function module can only be used in conjunction with a 3RF21 semiconductor relay or a 3RF23 semiconductor contactor.

Design

Mounting

Simply snapping onto the 3RF21 semiconductor relays or 3RF23 semiconductor contactors establishes the connections to the semiconductor switching devices. The connector on the semiconductor switching devices from the control circuit can be used on the converter without rewiring.

Functions

The analog value from a temperature controller is present at the 0–10 V terminals. This controls the on-to-off period, as a function of voltage. The period duration is predefined at one second. Conversion of the analog voltage is linear in the voltage range from 0.1 to 9.9 V. At voltages below 0.1 V the connected switching device is not activated, while at voltages above 9.9 V the connected switching device is always activated.

Technical specifications

Control input for converter and load monitoring

Type		3RF29 00-0EA18	3RF29 ..-0HA.
Analog input	V	0 ... 10	0 ... 10
Permissible range	V	-1 ... 11	-1 ... 11
Input resistance	kΩ	100	8
Period duration	s	1	1

Selection and ordering data

Rated operational current I_e	Rated operational voltage U_e	Rated control supply voltage U_s AC/DC 24 V	Std. Pack Qty.	Weight per pack approx.
A	V	Order No.		kg
—	—	3RF29 00-0EA18	1 unit	0.025



3RF29 00-0EA18

Solid-State Switching Devices

Function Modules

Load monitoring

Overview

Load monitoring for SIRIUS SC semiconductor switching devices

With the addition of the load monitoring module many faults can be quickly detected by monitoring a load circuit connected to the semiconductor switching device. Examples include the failure of load elements (up to 6 in the basic version or up to 12 in the extended version), alloyed power semiconductors, a lack of voltage or a break in a load circuit. A fault is indicated by one or more LEDs and reported to the controller via a PLC-compatible output.

The operating principle is based on monitoring of the current. This figure is continuously compared with the reference value stored once during commissioning by the simple press of a button. In order to detect the failure of one of several loads, the current decrease must be 1/6 (in the basic version) or 1/12 (in the extended version) of the reference value. In the event of a fault, a contact (NC) is actuated and one or more LEDs indicate the fault.

Area of application

The device is used for monitoring one or more loads (partial loads). The function module can only be used in conjunction with a 3RF21 semiconductor relay or a 3RF23 semiconductor contactor. The devices with spring-loaded connections in the load circuit are not suitable for use with load monitoring modules.

Design

Mounting

Simply snapping the load monitoring module onto the 3RF21 semiconductor relays or 3RF23 semiconductor contactors establishes the control connections to the semiconductor switching devices. Because of the special design, the straight-through transformer of the load monitoring module covers the lower main power connection. The cable to the load is simply pushed through and secured with the terminal screw.

Functions

The function module is activated when an "ON" signal is applied (IN terminal). The module constantly monitors the current level and compares this with the setpoint value.

Start-up

Pressing the "Teach" button switches the device on; the current through the semiconductor switching device is measured and is stored as the setpoint. During this process the two lower (red¹) LEDs flash alternately; simultaneous maintained light from the 3 (red¹) LEDs indicates the conclusion of the teaching process.

The "Teach" button can also be used to switch on the connected semiconductor switching device briefly for test purposes. In this case the "ON" LED is switched on.

Partial load faults, "basic" load monitoring

If a decrease of at least 1/6 of the stored setpoint value is detected, a fault is signaled. The fault is indicated via a "Fault" LED and by activation of the fault signaling output.

	OK	Fault		
LEDs		Partial load failure/ load short-circuit	Thyristor defect	Mains failure/ fuse rupture
ON/OFF	✓	✓	-	✓
Current flowing	✓	✓	✓	-
Group fault	-	✓	✓	✓

✓ Function is available
- Function not available

Partial load faults, "extended" load monitoring

Depending on the setting of the "response time" potentiometer, a decrease of at least 1/12 of the stored setpoint value after a response time of between 100 ms and 3 s is signaled as a fault. The fault is indicated via a "Load" LED and by activation of the fault signaling output.

The potentiometer can also be used to determine the response behavior of the fault signaling output. When delay values are set in the left-hand half, the fault signal is stored. This can only be reset by switching on and off by means of the control supply voltage.

When settings are made on the right-hand side, the fault output is automatically reset after the deviation has been corrected.

Voltage compensation, "extended" load monitoring

In addition to the current, the load voltage is also monitored. This makes it possible to compensate for influences on the current strength resulting from voltage fluctuations.

Thyristor fault

If a current greater than the residual current of the switching device is measured in the deenergized state, the device triggers a thyristor fault after the set time delay. This means that the fault output is activated and the "Fault" ("Thyristor"¹) LED lights up.

Supply fault

If no current is measured in the energized state, the device triggers a supply fault after the set time delay. This means that the fault output is activated and the "Fault" ("Supply"¹) LED lights up.

1) "Extended" load monitoring

Selection and ordering data

Rated operational current I_e A	Rated operational voltage U_e V	Rated control supply voltage U_s AC 110 V	Rated control supply voltage U_s AC/DC 24 V	Std. Pack Qty	Weight per pack approx.	Rated control supply voltage U_s DC 24 V	Std. Pack Qty	Weight per pack approx.
		Order No.	Order No.		kg	Order No.		kg
Basic load monitoring								
6	-	-	-			3RF29 06-0FA08 ¹⁾	1 unit	0.050
20	-	-	-			3RF29 20-0FA08		
Extended load monitoring								
20	110 ... 230	3RF29 20-0GA33	3RF29 20-0GA13	1 unit	0.120	-		
20	400 ... 600	3RF29 20-0GA36	3RF29 20-0GA16	1 unit	0.120	-		
50	110 ... 230	3RF29 50-0GA33	3RF29 50-0GA13	1 unit	0.120	-		
50	400 ... 600	3RF29 50-0GA36	3RF29 50-0GA16	1 unit	0.120	-		
90	110 ... 230	3RF29 90-0GA33	3RF29 90-0GA13	1 unit	0.120	-		
90	400 ... 600	3RF29 90-0GA36	3RF29 90-0GA16	1 unit	0.120	-		

1) To order with mounted 3RF29 00-ORA88 cover, add -0KH0 to part number.

Solid-State Switching Devices

3RF29 Function Modules

Heating current monitoring

Overview

Heating current monitoring for 3RF2 single-phase solid-state switching devices

Many faults can be quickly detected by monitoring a load circuit connected to the solid-state switching device, as made possible with this module. Examples include the failure of up to 6 load elements, alloyed power semiconductors, a lack of voltage or a break in a load circuit. A fault is indicated by LEDs and reported to the controller by way of a relay output (NC contact).

The principle of operation is based on permanent monitoring of the current strength. This figure is continuously compared with the reference value stored once during start-up. In order to detect the failure of one of several loads, the current difference must be 1/6 of the reference value. In the event of a fault, an output is actuated and the LEDs indicate the fault.

The heating current monitoring has a teach input and therefore differs from the load monitoring. This remote teaching function enables simple adjustment to changing loads without manual intervention.

Special versions: deviations from the standard version

3RF29 ...-0JA1.-1KK0

If the current is below 50 % of the lower teach current during the teach routine, the device will go into "Standby" mode; the LOAD LED will flicker. The device thus detects a non-connected load, e. g. channels not required for tool heaters, and does not signal a fault. This mode can be reset by re-teaching.

Application

The device is used for monitoring one or more loads (partial loads). The function module can only be used in conjunction with a 3RF21 solid-state relay or a 3RF23 solid-state contactor. The devices with spring-loaded connections in the load circuit are not suitable.

Selection and ordering data

Rated operational current I_e	Rated operational voltage U_e	Order No.	Std. Pack Qty	Weight per pack approx.
A	V			kg

Heating current monitoring¹⁾



Rated control supply voltage 24 V AC/DC

16	110 ... 230
16	110 ... 230
16	400 ... 600
32	110 ... 230
32	400 ... 600
32	400 ... 600

3RF29 16-0JA13	1 unit	0.175
3RF29 16-0JA13-1KK0	1 unit	0.175
3RF29 16-0JA16-1KK0	1 unit	0.175
3RF29 32-0JA13-1KK0	1 unit	0.175
3RF29 32-0JA16	1 unit	0.175
3RF29 32-0JA16-1KK0	1 unit	0.175

1) Supplied without control connector. The control connector can be purchased from Phoenix Contact by quoting Order No. 1982 790 (2.5 HC/6-ST-5.08).

Version	Order No.	Std. Pack Qty	Weight per pack approx.
			kg

Optional accessories



3RF29 00-ORA88

Sealable covers
for function modules (not for converters)

3RF29 00-ORA88	10 units	0.001
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* You can order this quantity or a multiple thereof.

Solid-State Switching Devices

3RF29 Function Modules

Power controllers

Overview

Power controllers for 3RF2 single-phase solid-state switching devices

The power controller is a function module for the autonomous power control of complex heating systems and inductive loads.

The following functions have been integrated:

- Power controller for adjusting the power of the connected load. Here, the setpoint value is set with a rotary knob on the module as a percentage with reference to the 100 % power stored as a setpoint value.
- Inrush current limitation: With the aid of an adjustable voltage ramp, the inrush current is limited by means of phase control. This is useful above all with loads such as lamps or infrared lamps which have an inrush transient current.
- Load circuit monitoring for detecting load failure, partial load faults, alloyed power semiconductors, lack of voltage or a break in the load circuit.

Special versions: deviations from the standard version

3RF29 04-0KA13-0KC0

During the teaching process the connected solid-state relay or contactor is not activated; i. e. no current flow takes place. No current reference value is stored. No part-load monitoring!

3RF29 ...-0KA1...-0KT0

No part-load monitoring!

Application

The power controller can be used for:

- Complex heating systems
- Inductive loads
- Loads with temperature-dependent resistor
- Loads with ageing after long-time service
- Simple indirect control of temperature

The power controller can be used on the instantaneously switching 3RF21 and 3RF23 solid-state switching devices (single-phase). If only the full-wave operating mode is used, the power controller can also be used on the "zero-point switching" solid-state relays and contactors.

Power control

The power controller adjusts the power in the connected load by means of a solid-state switching device depending on the setpoint selection. It does not compensate for changes in the mains voltage or load resistance. The setpoint value can be predefined externally as a 0 to 10 V signal or internally by means of a potentiometer. Depending on the setting of the potentiometer (t_p), the control is carried out according to the principle of full-wave control or generalized phase control.



Full-wave control

In this operating mode the output is adjusted to the required setpoint value changing the on-to-off period. The period duration is predefined at one second.

Generalized phase control

In this operating mode the output is adjusted to the required setpoint value by changing the current flow angle. In order to observe the limit values of the conducted interference voltage for industrial networks, the load circuit must include a reactor with a rating of at least 200 μ H.

Selection and ordering data

Rated operational current I_e		Rated operational voltage U_e	Order No.	Std. Pack Qty	Weight per pack approx.
A		V			kg
Power controllers					
	Rated control supply voltage 24 V AC/DC				
	4	110 ... 230	3RF29 04-0KA13-0KC0	1 unit	0.175
	4		3RF29 04-0KA13-0KT0	1 unit	0.175
	20		3RF29 20-0KA13	1 unit	0.175
	50		3RF29 50-0KA13	1 unit	0.175
	90		3RF29 90-0KA13	1 unit	0.175
	20	400 ... 600	3RF29 20-0KA16	1 unit	0.175
	50		3RF29 50-0KA16	1 unit	0.175
	50		3RF29 50-0KA16-0KT0	1 unit	0.175
	90		3RF29 90-0KA16	1 unit	0.175
Version		Order No.	Std. Pack Qty	Weight per pack approx.	
				kg	
Optional accessories					
	Sealable covers for function modules (not for converters)		3RF29 00-0RA88	10 units	0.001
3RF29 00-0RA88					

3RF29 00-0RA88

Overview

Power controllers for SIRIUS SC semiconductor switching devices

This module provides similar functionality to a power control regulator.

The following functions are integrated:

Power control regulator with proportional-action control for adjusting the power of the connected load. Here, the setpoint is set with a rotary knob on the module as a percentage with reference to the 100% power stored as a setpoint. In this way the power is kept constant even in the event of voltage fluctuations or a change in load resistance.

Inrush current limitation: With the aid of an adjustable voltage ramp, the inrush current is limited by means of phase control. This is useful above all with loads such as lamps which have an inrush transient current.

Load circuit monitoring for detecting load failure, alloyed power semiconductors, lack of voltage or a break in the load circuit.

Area of application

The power controller adjusts the current in the connected load by means of a semiconductor switching device depending on a setpoint. This compensates for changes in the mains voltage or in the load resistance. The setpoint can be predefined externally as a 0 to 10 V signal or internally by means of a potentiometer. Depending on the setting of the potentiometer (t_R), the adjustment is carried out according to the principle of full-wave control or generalized phase control.

Full-wave control

In this operating mode the output is adjusted to the required setpoint by changing the on-to-off period. The period duration is predefined at one second.

Generalized phase control

In this operating mode the output is adjusted to the required setpoint by changing the current flow angle. In order to observe the limit values of the conducted interference voltage for industrial power systems, a choke rated at at least 200 μ H must be included in the load circuit.

Design

Mounting

Easy snapping onto the 3RF21 semiconductor relays or 3RF23 semiconductor contactors establishes the connections to the semiconductor switching devices. Because of the special design, the straight-through transformer of the power controller module covers the lower main power connection. The cable to the load is simply pushed through and secured with the terminal screw.

Functions

Start-up

Pressing the "Teach" button switches the device on; the current through the semiconductor switching device and the mains voltage are detected and stored. The resultant output is taken as the 100% output for the setpoint selection. During this process the two lower red LEDs flash alternately. Simultaneous maintained light from the three red LEDs indicates the completion of the "Teach" process.

The "Teach" button can also be used to switch on the connected semiconductor switching device briefly for test purposes. In this case the "ON" LED is switched on.

Setpoint selection

The setting on the setpoint potentiometer (P) determines how the setpoint selection is to be made:

External setpoint selection

At 0 % the setpoint selection is set via an external 0 – 10 V analog signal (terminals IN / 0 – 10 V). The device is switched on and off via the power supply (terminals A1 / A2).

Internal setpoint selection

Above 0 % the setpoint is set using the potentiometer. To allow this, the potential at terminal A1 must additionally be applied at the IN terminal. After removal of the "ON" signal, the switching module is switched off.

Inrush current limitation

The ramp time (t_R) for a voltage ramp on switching on is set with the potentiometer for the purpose of inrush current limitation. If a time longer than 0 s is set, the device operates according to the phase-angle principle. If 0 s is set, there is no voltage ramp and the device operates according to the principle of full-wave control.

Load fault

If upon switching on with voltage applied the current flowing is not greater than the residual current of the switching device, the device triggers a load fault. The fault relay is activated and the "Load" LED lights up.

Thyristor fault

If a current greater than the residual current of the switching device is measured in the deenergized state, the device triggers a thyristor fault. The fault relay is activated and the "Thyristor" LED lights up.

Supply fault

If no current is measured in the energized state, the device triggers a supply fault. The fault relay is activated and the "Supply" LED lights up.

Selection and ordering data

Rated operational current I_e	Rated operational voltage U_e	Rated control supply voltage U_s AC 110 V	Rated control supply voltage U_s AC/DC 24 V	Std. Pack Qty	Weight per pack approx.
A	V	Order No.	Order No.		kg
Power controllers¹⁾					
20	110 ... 230	3RF29 20-0HA33	3RF29 20-0HA13	1 unit	0.120
20	400 ... 600	3RF29 20-0HA36	3RF29 20-0HA16	1 unit	0.120
50	110 ... 230	3RF29 50-0HA33	3RF29 50-0HA13	1 unit	0.120
50	400 ... 600	3RF29 50-0HA36	3RF29 50-0HA16	1 unit	0.120
90	110 ... 230	3RF29 90-0HA33	3RF29 90-0HA13	1 unit	0.120
90	400 ... 600	3RF29 90-0HA36	3RF29 90-0HA16	1 unit	0.120

1) Optional sealable cover - 3RF29 00-0RA88 can be used.

Solid-State Switching Devices

3RF29 Function Modules

Power control regulators

Overview

Power control regulators for SIRIUS solid-state switching devices

The power control regulator is a function module for the autonomous power control regulation of complex heating systems and inductive loads, for the operation of loads with temperature-dependent resistors or long-term aging, and for simple indirect temperature control.

The power control regulator can be used on the 3RF21 and 3RF23 instantaneous switching solid-state switching devices (single-phase). If only the full-wave control mode is used, the power control regulator can also be used on the zero-point-switching solid-state relays and contactors.

Application

The power control regulator sets the load current of the solid-state switching device depending on a setpoint value as a percentage. Changes in the mains voltage or in the load resistance are not compensated in this case. The modulation, the On/off ratio or the phase angle, remains unchanged in accordance with the setpoint. The autonomous power control regulation is performed between 0 and 100 % of the setpoint value

Full-wave control

If the left potentiometer t_R is set to 0 s (= far left), the power control regulator works according to the principle of full-wave control. The power set, be it internal or external, is converted into a pulse-width-modulated digital signal. The power control regulator controls the On and Off time of the solid-state switching device within a fixed period duration of 1 s so that the specified power is applied to the load. The "ON" LED flashes in the same rhythm as the solid-state switching device switches on and off.

Generalized phase control

If the left potentiometer t_R is set to higher than 0 s, the power control regulator works according to the principle of generalized phase control. With generalized phase control, a choke rated at at least 200 μ H must be included in the load circuit in order to observe the limit values of the conducted interference voltage for industrial networks.

Design

Mounting

Easy snapping onto the 3RF21 solid-state relays or 3RF23 solid-state contactors establishes the connections to the solid-state switching devices. Because of the special design, the straight-through transformer of the function module covers the lower main power connection. The cable to the load is simply pushed through and secured with the terminal screw.

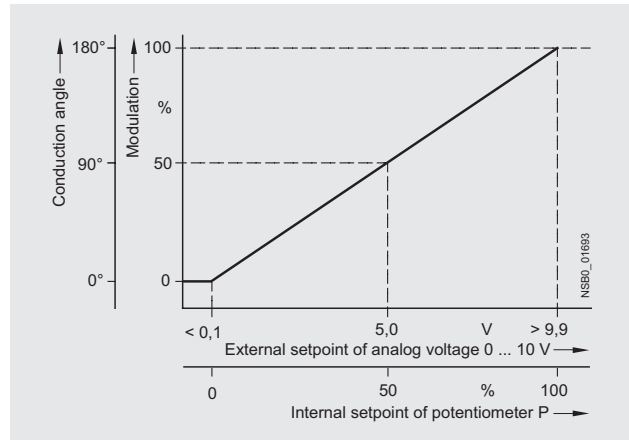
Function

Setpoint selection

The setpoint is selected either internally using the right-hand potentiometer P with 0 ... 100 % on the module or externally through the analog input 0 ... 10 V.

100 % corresponds in full-wave control to permanently On and in generalized phase control to a conduction angle of 180° and hence maximum power.

When the setpoint is selected internally the module is controlled through the IN terminal. The terminal 10 then has no function.



Input characteristic curve

When the setpoint is selected externally (potentiometer P set far left = 0 %) the module is controlled by applying the analog voltage 0 ... 10 V. 0 ... 10 V corresponds to 0 ... 100 % power. Conversion of the voltage is linear between 0.1 and 9.9 V. Below 0.1 V the switching device remains off; at voltages above 9.9 V the power is always set to 100 %.

Inrush current limitation

The ramp time (t_R) for a voltage ramp on switching on is set with the left potentiometer for the purpose of inrush current limitation. The set time refers to a power of 100 %. If, for example, a ramp time of 10 s is set and the selected power is 60 %, then a power of 60 % is reached after approx. 6 s.

Line and thyristor monitoring

The power control regulator recognizes supply failures and thyristor faults. The faults are indicated by the LEDs on the module and the fault output is activated.

Overview

22.5 mm semiconductor relays

With its compact design, which stays the same even at currents of up to 88 A, the 3RF21 semiconductor relay is the ultimate in space-saving construction, at a width of 22.5 mm. The logical connection arrangement, with the power infeed from above and connection of the load from below, ensures clean installation in the control cabinet.

Technical specifications

Type		3RF21 ..-1....	3RF21 ..-2....	3RF21 ..-3....
General data				
Ambient temperature				
during operation, derating from 40 °C	°C	-25 ... +60		
when stored	°C	-55 ... +80		
Site altitude	m	0 ... 1000; derating from 1000		
Shock resistance	g/ms	15/11		
acc. to IEC 60068-2-27				
Vibration resistance	g	2		
acc. to IEC 60068-2-6				
Degree of protection		IP20		
Electromagnetic compatibility (EMC)				
Emitted interference				
• Conducted interference voltage acc. to IEC 60947-4-3		Class A for industrial applications		
• Emitted, high-frequency interference voltage acc. to IEC 60947-4-3		Class A for industrial applications		
Noise immunity				
• Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2		
• Induced RF fields acc. to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1		
• Burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 1		
• Surge acc. to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2		
Connection technique		Screw-type connection	Spring-loaded connection	Ring cable connection
Main contact connection				
Conductor cross-section	mm ²			
Solid	mm ²	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2 x (0.5 ... 2.5)	-
Finely stranded with end sleeve	mm ²	2 x (1.5 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2 x (0.5 ... 1.5)	-
Finely stranded without end sleeves	mm ²		2 x (0.5 ... 2.5)	-
Solid or stranded AWG conductors	AWG	2 x (14 ... 10)	2 x (18 ... 14)	-
Insulation stripping length	mm	10	10	-
Terminal screw		M 4	-	M 5
• Tightening torque	Nm	2 ... 2.5	-	2 ... 2.5
	lb.in	18 ... 22	-	18 ... 22
Cable lug				
• DIN		-	-	DIN 46234
				-5-2.5, -5-6, -5-10, -5-16, -5-25
• JIS		-	-	JIS C 2805 R 2-5, 5-5-5, 8-5, 14-5
Auxiliary/control contact connections				
Conductor cross-section	mm ²	1x (0.5 ... 2.5); 2x (0.5 ... 1)	0.5 ... 1.5	1x (0.5 ... 2.5); 2x (0.5 ... 1)
	AWG	20 ... 12	20 ... 12	20 ... 12
Insulation stripping length	mm	7	10	7
Terminal screw		M 3	-	M 3
• Tightening torque	Nm	0.5 ... 0.6	-	0.5 ... 0.6
	lb.in	4.5 ... 5.3	-	4.5 ... 5.3

Type		3RF21 ..-....2	3RF21 ..-....4	3RF21 ..-....5	3RF21 ..-....6
Main circuit					
Rated operational voltage U_e	V	24 ... 230	230 ... 460	48 ... 600	400 ... 600
• Tolerance	%	-15 / +10			
• Rated frequency	Hz	50/60			
Rated insulation voltage U_i	V	600			
Blocking voltage	V	800	1200	1200	1600
Rate of voltage rise	V/µs	1000			

Solid-State Switching Devices

Solid-State Relays

3RF21 Solid-state technical data

Order No.	$I_{\max}^{1)}$ at $R_{\text{thha}}/T_U = 40\text{ °C}$		I_e acc. to IEC 60947-4-3 at $R_{\text{thha}}/T_U = 40\text{ °C}$		I_e acc. to UL/CSA at $R_{\text{thha}}/T_U = 50\text{ °C}$		Power loss at I_{\max}	Minimum load current	Leakage current
	A	K/W	A	K/W	A	K/W	W	A	mA
Main circuit									
3RF21 20-....	20	2.0	20	1.7	20	1.3	28.6	0.1	10
3RF21 30-1....	30	1.1	30	0.79	30	0.56	44.2	0.5	10
3RF21 50-1....	50	0.68	50	0.48	50	0.33	66	0.5	10
3RF21 50-2....	50	0.68	20	2.6	20	2.9	66	0.5	10
3RF21 50-3....	50	0.68	50	0.48	50	0.33	66	0.5	10
3RF21 70-1....	70	0.40	50	0.77	50	0.6	94	0.5	10
3RF21 90-1....	88	0.33	50	0.94	50	0.85	118	0.5	10
3RF21 90-2....	88	0.33	20	2.8	20	3.5	118	0.5	10
3RF21 90-3....	88	0.33	88	0.22	83	0.19	118	0.5	10

¹⁾ I_{\max} provides information about the performance of the solid-state relay.
The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

Note: The required heat sinks for the corresponding load currents can be determined from the characteristic curves, page 4/10. The minimum thickness values for the mounting surface must be observed.

Order No.	Rated impulse withstand capacity I_{tsm}	I^2t value
	A	A ² s
Main circuit		
3RF21 20-....	200	200
3RF21 30-..A.2	300	450
3RF21 30-..A.4	300	450
3RF21 30-..A.5	300	450
3RF21 30-..A.6	400	800
3RF21 50-....	600	1800
3RF21 70-..A.2	1200	7200
3RF21 70-..A.4	1200	7200
3RF21 70-..A.5	1200	7200
3RF21 70-..A.6	1150	6600
3RF21 90-....	1150	6600

Type		3RF21 ...-....2	3RF21 ...-....4	3RF21 ...-....5	3RF21 ...-....6
Main circuit					
Rated operational voltage U_e	V	24 ... 230	48 ... 460	48 ... 600	48 ... 600
• Operating range	V	20 ... 253	40 ... 506	40 ... 660	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %			
Rated insulation voltage U_i	V	600			
Blocking voltage	V	800	1200		1600
Rage of voltage rise	V/μs	1000			

Type		3RF21 ...-....0.	3RF21 ...-....1.	3RF21 ...-....2.	3RF21 ...-....4.
Control circuit					
Method of operation		DC operation	AC/DC operation	AC operation	DC operation
Rated control supply voltage U_s	V	24 acc. to EN 61131-2	24 AC 24 DC	110 ... 230	4 ... 30
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10 %	50/60 ± 10 %	--
Control supply voltage, max.	V	30	26.5 AC 30 DC	253	30
Typical actuating current	mA	20 / Low Power: 6.5 ¹⁾	20 20	15	20
Response voltage	V	15	14 AC 15 DC	90	4
Drop-out voltage	V	5	5 AC 5 DC	40	1
Operating times					
• ON-delay	ms	1 + max. one half-wave ²⁾	10 + max. one half-wave ²⁾	40 + max. one half-wave ²⁾	1 + max. one half-wave ²⁾
• OFF-delay	ms	1 + max. one half-wave	15 + max. one half-wave	40 + max. one half-wave	1 + max. one half-wave

¹⁾ Applies to the version "Low Power" 3RF21 ...-AA...-0KN0.

²⁾ Only for zero-point-switching devices.

Fused version with semiconductor protection (similar to type of coordination "2")¹⁾

The semiconductor protection for the SIRIUS controls can be used with different protective devices. This allows protection by means of LV HRC fuses of gG operational class or miniature circuit breakers. Siemens recommends the use of special SITOP semiconductor fuses. The table below lists the maximum permissible fuses for each SIRIUS control.

If a fuse is used with a higher rated current than specified, semiconductor protection is no longer guaranteed. However, smaller fuses with a lower rated current for the load can be used without problems.

For protective devices with gG operational class and for SITOP 3NE1 all-range fuses, the minimum cross-sections for the conductor to be connected must be taken into account.

Order No.	All-range fuses		Semiconductor fuses/partial-range fuses			
	LV HRC design	Cylindrical design	LV HRC design	Cylindrical design	aR/SITOR	aR/SITOR
	gR/SITOR	gR/NEOZED ²⁾	aR/SITOR	aR/SITOR	aR/SITOR	aR/SITOR
	3NE1	SILIZED 5SE1	3NE8	10 mm x 38 mm 3NC1 0	14 mm x 51 mm 3NC1 4	22 mm x 58 mm 3NC2 2
3RF21 20-...2	3NE1 814-0	5SE1 325	3NE8 015-1	3NC1 020	3NC1 420	3NC2 220
3RF21 20-...4	3NE1 813-0 ⁴⁾	5SE1 320	3NE8 015-1	3NC1 016 ⁴⁾	3NC1 420	3NC2 220
3RF21 20-...5 ³⁾	3NE1 813-0 ⁴⁾	5SE1 320	3NE8 015-1	3NC1 016 ⁴⁾	3NC1 420	3NC2 220
3RF21 30-...2	3NE1 815-0 ⁴⁾	5SE1 335	3NE8 003-1	3NC1 032	3NC1 432	3NC2 232
3RF21 30-...4	3NE1 815-0 ⁴⁾	5SE1 325 ⁴⁾	3NE8 003-1	3NC1 025 ⁴⁾	3NC1 430	3NC2 232
3RF21 30-...5 ³⁾	3NE1 815-0 ⁴⁾	5SE1 325 ⁴⁾	3NE8 003-1	3NC1 025 ⁴⁾	3NC1 430	3NC2 232
3RF21 30-...6	3NE1 815-0 ⁴⁾	--	3NE8 003-1	3NC1 032	3NC1 432	3NC2 232
3RF21 50-...2	3NE1 817-0	5SE1 350	3NE8 017-1	--	3NC1 450	3NC2 250
3RF21 50-...4	3NE1 802-0 ⁴⁾	5SE1 335 ⁴⁾	3NE8 017-1	--	3NC1 450	3NC2 250
3RF21 50-...5 ³⁾	3NE1 802-0 ⁴⁾	5SE1 335 ⁴⁾	3NE8 017-1	--	3NC1 450	3NC2 250
3RF21 50-...6	3NE1 803-0 ⁴⁾	--	3NE8 017-1	--	3NC1 450	3NC2 250
3RF21 70-...2 ⁵⁾	3NE1 820-0	5SE1 363 ⁴⁾	3NE8 020-1	--	--	3NC2 280
3RF21 70-...4 ⁵⁾	3NE1 020-2	5SE1 363 ⁴⁾	3NE8 020-1	--	--	3NC2 280
3RF21 70-...5 ³⁾⁵⁾	3NE1 020-2	--	3NE8 020-1	--	--	3NC2 280
3RF21 70-...6 ⁵⁾	3NE1 020-2	--	3NE8 020-1	--	--	3NC2 280
3RF21 90-...2 ⁵⁾	3NE1 021-2	--	3NE8 021-1	--	--	3NC2 200
3RF21 90-...4 ⁵⁾	3NE1 021-2	--	3NE8 021-1	--	--	3NC2 280 ⁴⁾
3RF21 90-...5 ³⁾⁵⁾	3NE1 021-2	--	3NE8 021-1	--	--	3NC2 280 ⁴⁾
3RF21 90-...6 ⁵⁾	3NE1 817-0 ⁴⁾	--	3NE8 021-1	--	--	3NC2 280 ⁴⁾

Order No.	Cable and line protection fuses				
	LV HRC design ⁴⁾	Cylindrical design ⁴⁾	gG	gG	DIAZED ⁴⁾
	gG	gG	gG	gG	quick
	3NA2	10 mm x 38 mm 3NW6 0	14 mm x 51 mm 3NW6 1	22 mm x 58 mm 3NW6 2	5SB
3RF21 20-...2	3NA2 803	3NW6 000-1	3NW6 101-1	--	5SB1 41
3RF21 20-...4	3NA2 801	--	3NW6 101-1	--	5SB1 41
3RF21 20-...5 ³⁾	3NA2 801	--	3NW6 101-1	--	5SB1 41
3RF21 30-...2	3NA2 803	--	3NW6 103-1	--	5SB1 71
3RF21 30-...4	3NA2 803	--	3NW6 101-1	--	5SB1 71
3RF21 30-...5 ³⁾	3NA2 803	--	3NW6 101-1	--	5SB1 71
3RF21 30-...6	3NA2 803-6	--	--	--	--
3RF21 50-...2	3NA2 810	--	3NW6 107-1	3NW6 207-1	5SB3 11
3RF21 50-...4	3NA2 807	--	--	3NW6 205-1	5SB3 11
3RF21 50-...5 ³⁾	3NA2 807	--	--	3NW6 205-1	5SB3 11
3RF21 50-...6	3NA2 807-6	--	--	--	--
3RF21 70-...2 ⁵⁾	3NA2 817	--	--	3NW6 217-1	5SB3 31
3RF21 70-...4 ⁵⁾	3NA2 812	--	--	3NW6 212-1	5SB3 31
3RF21 70-...5 ³⁾⁵⁾	3NA2 812	--	--	3NW6 212-1	--
3RF21 70-...6 ⁵⁾	3NA2 812-6	--	--	--	--
3RF21 90-...2 ⁵⁾	3NA2 817	--	--	3NW6 217-1	--
3RF21 90-...4 ⁵⁾	3NA2 812	--	--	3NW6 212-1	--
3RF21 90-...5 ³⁾⁵⁾	3NA2 812	--	--	3NW6 212-1	--
3RF21 90-...6 ⁵⁾	3NA2 812-6	--	--	--	--

Suitable fuse holders, fuse bases and controls can be found in Catalog LV 1, Chapter 19.

¹⁾ Type of coordination "2" according to EN 60947-4-1:

In the event of a short-circuit, the controls in the load feeder must not endanger persons or the installation. They must be suitable for further operation. For fused configurations, the protective device must be replaced.

²⁾ For use only with operational voltage U_o up to 400 V.

³⁾ For use only with operational voltage U_o up to 506 V.

⁴⁾ These fuses have a smaller rated current than the solid-state relays.

⁵⁾ These versions can also be protected against short-circuits with miniature circuit breakers as described in the notes on "SIRIUS Solid-State Contactors → Special Version Short-Circuit Resistant".

Solid-State Switching Devices

Solid-State Relays

3RF20 Solid-state relays technical data

Overview

45 mm semiconductor relays

The semiconductor relays with a width of 45 mm provide for connection of the power supply lead and the load from above. This makes it easy to retrofit existing semiconductor relays. The connection of the control cable also saves space in much the same way as the 22.5 mm design, as it is simply plugged on.

Technical specifications

Type	3RF20			
General data				
Ambient temperature during operation, derating at 40 °C when stored	°C °C	-25 ... +60 -55 ... +80		
Site altitude	m	0 ... 1000; derating from 1000		
Shock resistance acc. to IEC 60068-2-27	g/ms	15/11		
Vibration resistance acc. to IEC 60068-2-6	g	2		
Degree of protection		IP20		
Electromagnetic compatibility (EMC)				
Emitted interference				
• Conducted interference voltage IEC acc. to 60947-4-3		Class A for industrial applications		
• Emitted, high-frequency interference voltage acc. to IEC 60947-4-3		Class A for industrial applications		
Noise immunity				
• Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2		
• Induced RF fields acc. to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1		
• Burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 1		
• Surge acc. to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2		
Connection, main contacts, screw connection				
Conductor cross-section				
Solid	mm ²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6)		
Finely stranded with end sleeve	mm ²	2 x (1.5 ... 2.5); 2 x (2.5 ... 6); 1 x 10		
Solid or stranded AWG conductors	AWG	2 x (14 ... 10)		
Insulation stripping length	mm	10		
Terminal screw		M 4		
• Tightening torque	Nm	2 ... 2.5		
	lb.in	18 ... 22		
Connection, auxiliary/control contacts, screw connection				
Conductor cross-section	mm ²	1x (0.5 ... 2.5); 2x (0.5 ... 1.0); AWG 20 ... 12		
Insulation stripping length	mm	7		
Terminal screw		M 3		
• Tightening torque	Nm	0.5 ... 0.6		
	lb.in	4.5 ... 5.3		

Type	3RF20 .0-1AA.2	3RF20 .0-1AA.4	3RF20..-.....5	3RF20 .0-1AA.6
Main circuit				
Rated operational voltage U_e	V	24 ... 230	230 ... 460	48 ... 600
• Tolerance	%	-15/+10		
• Rated frequency	Hz	50/60		
Rated insulation voltage U_i	V	600		
Blocking voltage	V	800	1200	1200
Rate of voltage rise	V/µs	1000		1600

Order No.	$I_{\max}^{1)}$ at $R_{\text{thha}}/T_u = 40^\circ\text{C}$		I_e to IEC 60947-4-3 at $R_{\text{thha}}/T_u = 40^\circ\text{C}$		I_e to UL/CSA at $R_{\text{thha}}/T_u = 50^\circ\text{C}$		Power loss for I_{\max}	Minimum load current	Leakage current
	A	K/W	A	K/W	A	K/W	W	A	mA
Main circuit									
3RF20 20-1AA..	20	2.0	20	2.0	20	1.7	28.6	0.5	10
3RF20 30-1AA..	30	1.1	30	1.1	30	0.88	44.2	0.5	10
3RF20 50-1AA..	50	0.68	50	0.68	50	0.53	66	0.5	10
3RF20 70-1AA..	70	0.4	50	0.95	50	0.8	94	0.5	10
3RF20 90-1AA..	88	0.33	50	1.25	50	1.02	118	0.5	10

1) I_{\max} provides information about the performance of the semiconductor relay. The actual permitted operational current I_e can be smaller depending on the connection method and cooling conditions.

Order No.	Rated impulse withstand capacity I_{sm}	$\hat{P}t$ value
	A	A ² s
Main circuit		
3RF20 20-1AA..	200	200
3RF20 30-1AA.2	300	450
3RF20 30-1AA.4	300	450
3RF20 30-1AA.6	400	800
3RF20 50-1AA..	600	1800
3RF20 70-1AA.2	1200	7200
3RF20 70-1AA.4	1200	7200
3RF20 70-1AA.6	1150	6600
3RF20 90-1AA..	1150	6600

Type	3RF20 .0-1AA0.	3RF20 .0-1AA4.	3RF20 .0-1AA2.
Control circuit			
Method of operation	DC operation	DC operation	AC operation
Rated control supply voltage U_s	V	24 acc. to EN 61131-2	4 ... 30V DC
Max. rated control voltage	V	30	253
Rated control current at U_s	mA	15	6
Rated frequency of the control supply voltage	Hz	-	50/60
Response voltage	V	15	90
current	mA	>2	2
Drop-out voltage	V	5	40
Operating times			
closing time	ms	1 + max. one half wave	1 + max. one half wave
opening time	ms	1 + max. one half wave	40 + max. one half wave

Fused design with semiconductor protection

Order No.	All-range fuse LV design gR/SITOR 3NE1	Semiconductor protection fuse Cylindrical design			Cable and line protection fuse				DIAZED quick 5SB
		10 × 38 mm aR/SITOR 3NC1 0	14 × 51 mm aR/SITOR 3NC1 4	22 × 58 mm aR/SITOR 3NC2 2	LV design gL/gG/3NA	Cylindrical design		22 × 58 mm gL/gG 3NW	
						10 × 38 mm gL/gG 3NW	14 × 51 mm gL/gG 3NW		
3RF20 20-1AA.2	3NE1 814-0	3NC1 020	3NC1 420	3NC2 220	3NA2 803	3NW6 001-1	3NW6 101-1	-	5SB1 71
3RF20 20-1AA.4	3NE1 813-0	3NC1 016	3NC1 420	3NC2 220	3NA2 801	-	3NW6 101-1	-	5SB1 41
3RF20 30-1AA.2	3NE1 815-0	3NC1 032	3NC1 432	3NC2 232	3NA2 803	-	3NW6 103-1	-	5SB3 11
3RF20 30-1AA.4	3NE1 815-0	3NC1 025	3NC1 432	3NC2 232	3NA2 803	-	3NW6 101-1	-	5SB1 71
3RF20 30-1AA.6	3NE1 815-0	3NC1 032	3NC1 432	3NC2 232	3NA2 803-6	-	-	-	-
3RF20 50-1AA.2	3NE1 817-0	-	3NC1 450	3NC2 250	3NA2 810	-	3NW6 107-1	3NW6 207-1	5SB3 21
3RF20 50-1AA.4	3NE1 802-0	-	3NC1 450	3NC2 250	3NA2 807	-	-	3NW6 205-1	5SB3 11
3RF20 50-1AA.6	3NE1 803-0	-	3NC1 450	3NC2 250	3NA2 807-6	-	-	-	-
3RF20 70-1AA.2 ²⁾	3NE1 820-0	-	-	3NC2 280	3NA2 817	-	-	3NW6 217-1	5SB3 31
3RF20 70-1AA.4 ²⁾	3NE1 020-2	-	-	3NC2 280	3NA2 812	-	-	3NW6 212-1	5SB3 21
3RF20 70-1AA.6 ²⁾	3NE1 020-2	-	-	3NC2 280	3NA2 812-6	-	-	-	-
3RF20 90-1AA.2 ²⁾	3NE1 021-2	-	-	3NC2 200	3NA2 817	-	-	3NW6 217-1	5SB3 31
3RF20 90-1AA.4 ²⁾	3NE1 021-2	-	-	3NC2 280	3NA2 812	-	-	3NW6 212-1	5SB3 21
3RF20 90-1AA.6 ²⁾	3NE1 020-2	-	-	3NC2 280	3NA2 812-6	-	-	-	-

1) Type of coordination "2" acc. to EN 60947-4-1:

In the event of a short-circuit, the control gear in the load feeder must not endanger persons or the installation. They must be suitable for further operation. For fused configurations, the protective device must be replaced.

2) These versions can also be protected against short-circuit with miniature circuit-breakers as described on page 7/11.

Solid-State Switching Devices

Solid-State Relays

3RF22 Solid-state relays technical data

Overview

45 mm solid-state relays

The 3RF22 solid-state relays with a width of 45 mm provide space advantages over solutions with single-phase versions. The logical connection arrangement, with the power infeed from above and connection of the load from below, ensures tidy installation in the control cabinet.

Important features:

- LED indicators
- Variety of connection techniques
- Plug-in control connection
- Degree of protection IP20
- Zero-point switching,
- Two or three-phase controlled

Technical specifications

Type		3RF22 ..-1....	3RF22 ..-2....	3RF22 ..-3....
General data				
Ambient temperature				
• During operation, derating from 40 °C	°C	-25 ... +60		
• During storage	°C	-55 ... +80		
Site altitude	m	0 ... 1000; > 1000 ask Technical Assistance		
Shock resistance acc. to IEC 60068-2-27	g/ms	15/11		
Vibration resistance acc. to IEC 60068-2-6	g	2		
Degree of protection		IP20		
Insulation strength at 50/60 Hz (main/control circuit to ground)	V rms	4000		
Electromagnetic compatibility (EMC)				
• Emitted interference		Class A for industrial applications ¹⁾		
- Conducted interference voltage acc. to IEC 60947-4-3		Class A for industrial applications		
- Emitted, high-frequency interference voltage acc. to IEC 60947-4-3				
• Interference immunity		Contact discharge 4; air discharge 8; behavior criterion 2		
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV			
- Induced RF fields acc. to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1		
- Burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 1		
- Surge acc. to IEC 61000-4-5	kV	Conductor – ground 2; conductor – conductor 1; behavior criterion 2		
Connection technique		Screw terminal	Spring-loaded connection	Ring terminal end connection
Main contact connection				
• Conductor cross-section				
- Solid	mm ²	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2 x (0.5 ... 2.5)	--
- Finely stranded with end sleeve	mm ²	2 x (1 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2 x (0.5 ... 1.5)	--
- Finely stranded without end sleeve	mm ²	--	2 x (0.5 ... 2.5)	--
- Solid or stranded, AWG conductors		2 x (AWG 14 ... 10)	2 x (AWG 18 ... 14)	--
• Stripped length	mm	10	10	
• Terminal screw		M4	--	M5
- Tightening torque, Ø 5 ... 6 mm, PZ 2	Nm	2 ... 2.5		2.5 ... 2
	lb.in	18 ... 22		18 ... 22
• Cable lug		--	--	
- acc. to DIN 46234				5-2.5 ... 5-25
- acc. to JIS C 2805				R 2-5 ... 14-5
Connection, auxiliary/control contacts				
• Conductor cross-section, with or without end sleeve	mm AWG	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0) 20 ... 12	0.5 ... 2.5 20 ... 12	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0) 20 ... 12
• Stripped length	mm	7	10	7
• Terminal screw		M3	--	M3
- Tightening torque, Ø 3.5, PZ 1	Nm	0.5 ... 0.6		0.5 ... 0.6
	lb.in	4.5 ... 5.3		4.5 ... 5.3

1) These products were built as Class A devices. The use of these devices in residential areas could result in radio interference. In this case they may be required to introduce additional damping measures.

Type		3RF22 ...-AB.5	3RF22 ...-AC.5
Main circuit			
Controlled phases		Two-phase	Three-phase
Rated operational voltage U_e	V	48 ... 600	48 ... 600
• Operating range	V	40 ... 660	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %	50/60 ± 10 %
Rated insulation voltage U_i	V	600	600
Rated impulse withstand voltage U_{imp}	kV	6	6
Blocking voltage	V	1200	1200
Rate of voltage rise	V/μs	1.000	1.000

Order No.	$I_{max}^{1)}$ at $R_{thha}/T_u = 40\text{ °C}$		I_e acc. to IEC 60947-4-3 at $R_{thha}/T_u = 40\text{ °C}$		I_e acc. to UL/CSA at $R_{thha}/T_u = 50\text{ °C}$		Power loss at I_{max}	Minimum load current	Max. leakage current
	A	K/W	A	K/W	A	K/W	W	A	mA
Main circuit									
3RF22 30-. AB..	30	0.57	30	0.57	30	0.44	81	0.5	10
3RF22 55-1AB..	55	0.18	50	0.27	50	0.19	151	0.5	10
3RF22 55-2AB..			20	1.83	20	1.58			
3RF22 55-3AB..			50	0.27	50	0.19			
3RF22 30-. AC..	30	0.33	30	0.33	30	0.25	122	0.5	10
3RF22 55-1AC..	55	0.09	50	0.15	50	0.1	226	0.5	10
3RF22 55-2AC..			20	1.19	20	1.02			
3RF22 55-3AC..			88	0.15	83	0.1			

1) I_{max} provides information about the performance of the solid-state relay.
The actual permitted rated operational current I_e can be smaller depending on the connection method and cooling conditions.

Order No.	Rated impulse withstand capacity I_{tsm}	I^2t value
	A	A ² s
Main circuit		
3RF22 30-....5	300	450
3RF22 55-....5	600	1800

Type		3RF22 ...-AB4. / 3RF22 ...-AC4.
Control circuit		
Method of operation		DC operation
Rated control supply voltage U_s	V	4 ... 30
Response voltage	V	15
• For tripping current	mA	2
Drop-out voltage	V	1
Operating times		
• ON-delay	ms	1 + max. one half-wave
• OFF delay	ms	1 + max. one half-wave

Solid-State Switching Devices

Solid-State Contactors

3RF23 Solid-state contactors technical data

Technical specifications

Order No.		3RF23 ...A...	3RF23 ...B...	3RF23 ...C...	3RF23 ...D...
General data					
Ambient temperature					
during operation, derating at 40 °C	°C	-25 ... +60			
when stored	°C	-55 ... +80			
Site altitude	m	0 ... 1000; derating from 1000			
Shock resistance acc. to IEC 60068-2-27	g/ms	15/11			
Vibration resistance acc. to IEC 60068-2-6	g	2			
Degree of protection		IP20			
Electromagnetic compatibility (EMC)					
Emitted interference acc. to IEC 60947-4-3		Class A for industrial applications		Class A for industrial applications;	Class A for industrial applications
<ul style="list-style-type: none">Conducted interference voltageEmitted high-frequency interference voltage				Class B for residential/business/commercial areas up to 16 A, AC51 Low Noise	
Noise immunity					
<ul style="list-style-type: none">Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2			
<ul style="list-style-type: none">Induced RF fields acc. to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1			
<ul style="list-style-type: none">Burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 1			
<ul style="list-style-type: none">Surge acc. to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2			

Order No.	3RF23 ...-1....	3RF23 ...-2....	3RF23 ...-3....
General data			
Connection technique	Screw connection	Spring-loaded connection	Ring cable connection
Main contact connection			
Conductor cross-section			
Solid	mm ²	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2 x (0.5 ... 2.5)
Finely stranded with end sleeve	mm ²	2 x (1.5 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2 x (0.5 ... 1.5)
Finely stranded without end sleeves	mm ²		2 x (0.5 ... 2.5)
Solid or stranded AWG conductors	AWG	2 x (14 ... 10)	2 x (18 ... 14)
Insulation stripping length	mm	10	10
Terminal screw		M 4	M 5
• Tightening torque	Nm	2 ... 2.5	2 ... 2.5
• Tightening torque	lb.in	18 ... 22	18 ... 22
Cable lug		-	-
• DIN		-	DIN 46234
• JIS		-	-5-2.5, -5-6, -5-10, -5-16, -5-25 JIS C 2805 R 2-5, 5.5-5, 8-5, 14-5
Auxiliary/control contact connections			
Conductor cross-section	mm ²	1x (0.5 ... 2.5); 2x (0.5 ... 1.0)	0.5 ... 1.5
AWG		20 ... 12	20 ... 12
Insulation stripping length	mm	7	10
Terminal screw		M 3	M 3
• Tightening torque	Nm	0.5 ... 0.6	0.5 ... 0.6
	lb.in	4.5 ... 5.3	4.5 ... 5.3

Type	3RF23 ...-...2	3RF23 ...-...4	3RF21 ...-...5	3RF23 ...-...6
Main circuit				
Rated operational voltage U_o	V	24 ... 230	230 ... 460	48 ... 600
• Tolerance	%	-15/+10		
• Rated frequency	Hz	50/60 Hz		
Rated insulation voltage U_i	V	600		
Blocking voltage	V	800	1200	1200
Rate of voltage rise	V/μs	1000		1600

Type	3RF23 ...-...0.	3RF23 ...-...2.
Control circuit		
Method of operation	DC operation	AC operation
Rated control supply voltage U_s	V	24 to EN 61131-2
Max. rated control voltage	V	30
Rated control current at U_s	mA	15
Rated frequency of the control supply voltage	Hz	50/60
Response voltage	V	15
for tripping current	mA	2
Drop-out voltage	V	5
Operating times		
closing time	ms	1 + max. one half-wave
opening time	ms	1 + max. one half-wave

Technical specifications

Order No.	Type current AC-51 ¹⁾			Power loss at <i>I</i> _{max}	Minimum load current	Leakage current	Rated impulse withstand capacity <i>I</i> _{tsm}	<i>I</i> ² <i>t</i> value
	<i>I</i> _{max}	acc. to IEC 60947-4-3 at 40 °C	UL/CSA at 50 °C					
	A	A	A					
Main circuit								
3RF23 1.-A..2 3RF23 1.-A..4 3RF23 1.-A.45 3RF23 1.-A..6	10.5	7.5	9.6	11	0.5	10 200 400	200 200 800	
3RF23 2.-A..2 3RF23 2.-C..2 3RF23 2.-D..2 3RF23 2.-A..4 3RF23 2.-C..4 3RF23 2.-D..4 3RF23 2.-A.45 3RF23 2.-A..6	20	13.2	17.6	20	0.5	10 25 10 10 25 10 1150 600	1800 1800 6600 1800 1800 6600 1800	
3RF23 3.-A..2 3RF23 3.-A..4 3RF23 3.-A.45 3RF23 3.-A..6	30	22	27	33	0.5	10	600	1800
3RF23 4.-A..2 3RF23 4.-A..4 3RF23 4.-A.45 3RF23 4.-A..6	40	33	36	44	0.5	10	1200 1200 1150	7200 7200 6600
3RF23 5.-A..2 3RF23 5.-A..4 3RF23 5.-A.45 3RF23 5.-A..6	50	36	45	54	0.5	10	1150	6600
3RF23 7.-A..2 3RF23 7.-A..4 3RF23 7.-A.45 3RF23 7.-A..6	70	70	62	83	0.5	10	1150	6600
3RF23 9.-A..2 3RF23 9.-A..4 3RF23 9.-A.45 3RF23 9.-A..6	88	88	80	117	0.5	10	1150	6600

Order No.	Type current AC-51 ¹⁾					Power loss at I_{\max}	Minimum load current	Leakage current	Rated impulse withstand capacity I_{sm}	\hat{I}^2t value
	I_{\max} at 40 °C	acc. to IEC 60947- 4-3 at 40 °C	UL/CSA at 50 °C	AC-15 Parameters						
	A	A	A	A	W					
Main circuit										
3RF23 1.-B..2 3RF23 1.-B..4 3RF23 1.-B..6	10.5	7.5	9.6	6	1200 1/h 50 % ED	11	0.5	10	200 200 400	200 200 800
3RF23 2.-B..2 3RF23 2.-B..4 3RF23 2.-B..6	20	13.2	17.6	12	1200 1/h 50 % ED	20	0.5	10	600	1800
3RF23 3.-B..2 3RF23 3.-B..4 3RF23 3.-B..6	30	22	27	15	1200 1/h 50 % ED	33	0.5	10	600	1800
3RF23 4.-B..2 3RF23 4.-B..4 3RF23 4.-B..6	40	33	36	20	1200 1/h 50 % ED	44	0.5	10	1200 1200 1150	7200 7200 6600
3RF23 5.-B..2 3RF23 5.-B..4 3RF23 5.-B..6	50	36	45	25	1200 1/h 50 % ED	54	0.5	10	1150	6600
3RF23 7.-B..2 3RF23 7.-B..4 3RF23 7.-B..6	70	70	62	27.5	1200 1/h 50 % ED	83	0.5	10	1150	6600
3RF23 9.-B..2 3RF23 9.-B..4 3RF23 9.-B..6	88	88	80	30	1200 1/h 50 % ED	117	0.5	10	1150	6600

1) The type current provides information about the performance of the semi-conductor contactor. The actual permitted operational current I_b can be smaller depending on the connection method and start-up conditions. Derating acc. to curves from page 7/34, 7/35, 7/36.

Solid-State Switching Devices

Solid-State Contactors

3RF23 Solid-state contactors technical data

Fused design with semiconductor protection (similar to type of coordination "2")¹⁾

The semiconductor protection for the SIRIUS SC controlgear can be used with different protective devices. This allows protection by means of LV HRC fuses of operational class gL/gG or supplementary protectors. Siemens recommends the use of special SITOR semiconductor fuses. The table below lists the maximum permissible fuses for each SIRIUS SC control gear.

If a fuse is used with a higher rated current than specified, semiconductor protection is no longer guaranteed. However, smaller fuses with a lower rated current for the load can be used without problems.

For protective devices with operational class gL/gG and for SITOR full range fuses 3NE1, the minimum cross-sections for the conductor to be connected must be taken into account.

Order No.	All-range fuse LV HRC design gR/SITOR 3NE1	Semiconductor protection fuse Cylindrical design			Cable and line protection fuse				DIAZED quick 5SB
		10 x 38 mm aR/SITOR 3NC1 0	14 x 51 mm aR/SITOR 3NC1 4	22 x 58 mm aR/SITOR 3NC2 2	LV HRC design gL/gG 3NA	Cylindrical design			
						10 x 38 mm gL/gG 3NW	14 x 51 mm gL/gG 3NW	22 x 58 mm gL/gG 3NW	
3RF23 1-.....2	3NE1 813-0	3NC1 010	3NC1 410	3NC2 220	3NA2 803	3NW6 001-1	3NW6 101-1	-	5SB1 41
3RF23 1-.....4	3NE1 813-0	3NC1 010	3NC1 410	3NC2 220	3NA2 801	3NW6 001-1	3NW6 101-1	-	5SB1 41
3RF23 1-.....6	3NE1 813-0	3NC1 010	3NC1 410	3NC2 220	3NA2 803-6	-	-	-	-
3RF23 2-.....2	3NE1 814-0	3NC1 020	3NC1 420	3NC2 220	3NA2 807	3NW6 007-1	3NW6 107-1	3NW6 207-1	5SB1 71
3RF23 2-.....4	3NE1 814-0	3NC1 020	3NC1 420	3NC2 220	3NA2 807	3NW6 005-1	3NW6 105-1	3NW6 205-1	5SB1 71
3RF23 2-.....6	3NE1 814-0	3NC1 020	3NC1 420	3NC2 220	3NA2 807-6	-	-	-	-
3RF23 3-.....2	3NE1 803-0	3NC1 032	3NC1 432	3NC2 232	3NA2 810	-	3NW6 107-1	3NW6 207-1	5SB3 11
3RF23 3-.....4	3NE1 803-0	3NC1 032	3NC1 432	3NC2 232	3NA2 807	-	3NW6 105-1	3NW6 205-1	5SB3 11
3RF23 3-.....6	3NE1 803-0	3NC1 032	3NC1 432	3NC2 232	3NA2 807-6	-	-	-	-
3RF23 4-.....2	3NE1 802-0	-	3NC1 440	3NC2 240	3NA2 817	-	3NW6 117-1	3NW6 217-1	5SB3 21
3RF23 4-.....4	3NE1 802-0	-	3NC1 440	3NC2 240	3NA2 812	-	3NW6 112-1	3NW6 212-1	5SB3 21
3RF23 4-.....6	3NE1 802-0	-	3NC1 440	3NC2 240	3NA2 812-6	-	-	-	-
3RF23 5-.....2	3NE1 817-0	-	3NC1 450	3NC2 250	3NA2 817	-	3NW6 117-1	3NW6 217-1	5SB3 21
3RF23 5-.....4	3NE1 817-0	-	3NC1 450	3NC2 250	3NA2 812	-	-	3NW6 210-1	5SB3 21
3RF23 5-.....6	3NE1 817-0	-	3NC1 450	3NC2 250	3NA2 812-6	-	-	-	-
3RF23 7-.....2	3NE1 820-0	-	-	3NC2 280	3NA2 817	-	-	3NW6 217-1	5SB3 31
3RF23 7-.....4	3NE1 020-2	-	-	3NC2 280	3NA2 812	-	-	3NW6 210-1	5SB3 21
3RF23 7-.....6	3NE1 020-2	-	-	3NC2 280	3NA2 812-6	-	-	-	-
3RF23 9-.....2	3NE1 021-2	-	-	3NC2 200	3NA2 817	-	-	3NW6 217-1	5SB3 31
3RF23 9-.....4	3NE1 021-2	-	-	3NC2 280	3NA2 812	-	-	3NW6 210-1	5SB3 21
3RF23 9-.....6	3NE1 020-2	-	-	3NC2 280	3NA2 812-6	-	-	-	-

1) Type of coordination "2" acc. to EN 60947-4-1:

In the event of a short-circuit, the controlgear in the load feeder must not endanger persons or the installation. They must be suitable for further operation. For fused configurations, the protective device must be replaced.

Overview

The complete units consist of a solid-state relay plus optimized heat sink, and are therefore ready to use. They offer defined rated currents to make selection as easy as possible. Depending on the version, current intensities of up to 50 A are achieved. Like all of our solid-state switching devices, one of their particular advantages is their compact and space-saving design. With their insulated mounting foot they can easily be snapped onto a standard mounting rail, or they can be mounted on carrier plates with fixing screws. This insulation enables them to be used in

circuits with protective extra-low voltage (PELV) or safety extra-low voltage (SELV) in building engineering. For other applications, such as for extended personal safety, the heat sink can be grounded through a screw terminal.

Version for resistive loads, "zero-point switching"

This standard version is often used for switching space heaters on and off.

Technical specifications

Order No.		3RF24 ..-1....	3RF24 ..-2....	3RF24 ..-3....
General data				
Ambient temperature				
• During operation, derating from 40 °C	°C	-25 ... +60		
• During storage	°C	-55 ... +80		
Site altitude	m	0 ... 1000; derating from 1000		
Shock resistance	acc. to IEC 60068-2-27	g/ms	15/11	
Vibration resistance	acc. to IEC 60068-2-6	g	2	
Degree of protection		IP20		
Insulation strength	at 50/60 Hz (main/control circuit to ground)	V rms	4000	
Electromagnetic compatibility (EMC)				
• Emitted interference acc. to IEC 60947-4-3		Class A for industrial applications ¹⁾ Class A for industrial applications		
- Conducted interference voltage				
- Emitted, high-frequency interference voltage				
• Interference immunity		Contact discharge 4; air discharge 8; behavior criterion 2		
- Electrostatic discharge	kV			
acc. to IEC 61000-4-2 (corresponds to degree of severity 3)				
- Induced RF fields	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1		
acc. to IEC 61000-4-6				
- Burst acc. to IEC 61000-4-4	kV	2/5.0 kHz; behavior criterion 1		
- Surge acc. to IEC 61000-4-5	kV	Conductor – ground 2; conductor – conductor 1; behavior criterion 2		
Connection technique		Screw terminal	Spring-loaded connection	Ring terminal end connection
Main contact connection				
• Conductor cross-section				
- Solid	mm ²	2 x (1.5 ... 2.5), 2 x (2.5 ... 6)	2x (0.5 ... 2.5)	--
- Finely stranded with end sleeve	mm ²	2 x (1 ... 2.5), 2 x (2.5 ... 6), 1 x 10	2x (0.5 ... 1.5)	--
- Finely stranded without end sleeve	mm ²	--	2x (0.5 ... 2.5)	--
- Solid or stranded, AWG conductors		2 x (AWG 14 ... 10)	2 x (AWG 18 ... 14)	--
• Stripped length	mm	10	10	--
• Terminal screw		M4	--	M5
- Tightening torque	NM	2 ... 2.5		2 ... 2.5
	lb.in	18 ... 22		18 ... 22
• Cable lug		--	--	
- acc. to DIN 46234				5-2.5 ... 5-25
- acc. to JIS C 2805				R 2-5 ..., 14-5
Connection, auxiliary/control contacts				
• Conductor cross-section	mm	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)	0.5 ... 2.5	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)
	AWG	AWG 20 ... 12	AWG 20 ... 12	AWG 20 ... 12
• Stripped length	mm	7	10	7
• Terminal screw		M3	--	M3
- Tightening torque,	NM	0.5 ... 0.6		0.5 ... 0.6
Ø 3.5, PZ 1	lb.in	4.5 ... 5.3		4.5 ... 5.3

1) These products were built as Class A devices. The use of these devices in residential areas could result in radio interference. In this case the may be required to introduce additional damping measures.

Solid-State Switching Devices

Solid-State Contactors

3RF24 Solid-state contactors technical data

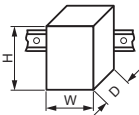


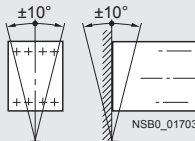
Type		3RF24 ...-AB.5	3RF24 ...-AC.5
Main circuit			
Controlled phases		Two-phase	Three-phase
Rated operational voltage U_e	V	48 ... 600	48 ... 600
• Operating range	V	40 ... 660	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %	50/60 ± 10 %
Rated insulation voltage U_i	V	600	600
Rated impulse withstand voltage U_{imp}	kV	6	6
Blocking voltage	V	1200	1200
Rate of voltage rise	V/μs	1000	1000

Order No.	Type current I_{AC-51} at 40 °C	Rated operational current I_e acc. to IEC 60947-4-3 for 40°C	acc. to UL/CSA for 50 °C	Power loss at I_{AC-51}	Minimum load current	Max. leakage current	Rated impulse withstand current I_{tsm}	I^2t value
	A	A	A	w	A	mA	A	A²s
Main circuit								
3RF24 10-AB.5	10.5	7.5	9.5	21	0.1	10	200	200
3RF24 20-AB.5	20	15	18	39	0.5	10	500	1800
3RF24 30-AB.5	30	22	26	61	0.5	10	1200	7200
3RF24 40-AB.5	40	32	35	81	0.5	10	1150	6600
3RF24 50-AB.5	50	38	45	105	0.5	10	1150	6600
3RF24 10-AC.5	10.5	7	9	32	0.1	10	300	450
3RF24 20-AC.5	20	15	18	67	0.5	10	600	1800
3RF24 30-AC.5	30	22	26	93	0.5	10	1200	7200
3RF24 40-AC.5	40	29	35	121	0.5	10	1150	6600
3RF24 50-AC.5	50	38	45	160	0.5	10	1150	6600

1) The type current provides information about the performance of the solid-state contactor. The actual permitted rated operational current I_e can be smaller depending on the connection method and start-up conditions. For derating see the characteristic curves on page 4/18.

Type		3RF24 ...-...4.	3RF24 ...-...5.
Control circuit			
Method of operation		DC operation	AC operation
Rated control supply voltage U_s	V	4 ... 30	190 ... 230
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10%
Actuating voltage, max. • For actuating current	V mA	30 15	253 6
Response voltage • For tripping current	V mA	4 > 3	180 > 2
Drop-out voltage	V	< 1	< 40
Operating times • ON-delay • OFF delay	ms ms	1 + max. one half-wave 1 + max. one half-wave	40 + max. one half-wave 40 + max. one half-wave

Technical specifications

Type			3RF34 05-1BB.. 3RF34 03-1BD.. 3RF34 05-1BD..	3RF34 10-1BB.. 3RF34 12-1BB.. 3RF34 16-1BB.. 3RF34 10-1BD..	3RF34 05-2BB..	3RF34 10-2BB.. 3RF34 12-2BB.. 3RF34 16-2BB..
Dimensions (W x H x D)		mm	45 x 95 x 96.5	90 x 95 x 96.5	45 x 95 x 96.5	90 x 95 x 96.5
General technical specifications						
Ambient temperature						
• During operation, derating from 40 °C		°C	-25 ... +60			
• During storage		°C	-55 ... +80			
Installation altitude		m	0 ... 1000; derating from 1000 on request			
Shock resistance acc. to IEC 60068-2-27		g/ms	15/11			
Vibration resistance acc. to IEC 60068-2-6		g	2			
Degree of protection			IP20			
Insulation strength at 50/60 Hz (main/control circuit to floor)		V rms	4000			
Electromagnetic compatibility (EMC)						
• Emitted interference according to IEC 60947-4-2			Class A for industrial applications ¹⁾			
- Conducted interference voltage			Class A for industrial applications			
• Emitted, high-frequency interference voltage						
• Interference immunity						
- Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)		kV	Contact discharge: 4; Air discharge: 8; Behavior criterion 2			
- Induced RF fields according to IEC 61000-4-6		MHz	0.15 ... 80; 140 dBµV; behavior criterion 1			
- Burst acc. to IEC 61000-4-4		kV	2; at 5 kHz; behavior criterion 2			
- Surge according to IEC 61000-4-5 ²⁾		kV	Conductor - Ground: 2; Conductor - Conductor: 1; Behavior criterion 2			
Connection type			 Screw terminals		 Spring-type terminals	
Operating devices			Standard screwdriver size 2 and Pozidriv 2		3.0 x 0.5 and 3.5 x 0.5	
Conductor cross-sections, main contacts						
• Solid		mm ²	2 x (1.5 ... 2.5) ³⁾ , 2 x (2.5 ... 6) ³⁾			2 x (0.5 ... 2.5)
• Finely stranded with end sleeve		mm ²	2 x (1 ... 2.5) ³⁾ , 2 x (2.5 ... 6) ³⁾ ; 1 x 10			2 x (0.5 ... 1.5)
• Finely stranded without end sleeve		mm ²	--			2 x (0.5 ... 2.5)
• AWG cables, solid or stranded			2 x (AWG 14 ... 10)			2 x (AWG 18 ... 14)
Conductor cross-sections, auxiliary/control contacts						
• With/without end sleeve		mm ²	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)			0.5 ... 2.5
• AWG cables, solid or stranded			AWG 20 ... 12			AWG 20 ... 12
Permissible mounting positions						
						

¹⁾ These products were built as Class A devices. The use of these devices in residential areas could result in radio interference. In this case these may be required to introduce additional interference suppression measures.

²⁾ The following applies for reversing contactors: To maintain the values, a 3TX7 462-3L surge suppressor (see "3TB Contactors", Chapter 3) should be used between the phases L1 and L3 as close as possible to the reversing contactor.

³⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

Solid-State Switching Devices

Solid-State Contactors

3RF34 Solid-state contactors technical data

Overview

These two-phase controlled, instantaneous switching solid-state contactors in the insulating enclosure are offered in 45 mm width to 5.2 A – and in 90 mm width to 16 A. This means that it is possible to operate motors up to 7.5 kW.

Technical specifications

Type		3RF34 05-.BB..	3RF34 10-.BB..	3RF34 12-.BB..	3RF34 16-.BB..
Fuseless design with 3RV2 motor starter protector, CLASS 10					
Rated operational current I_{AC-53}¹⁾ according to IEC 60947-4-2					
• At 40 °C	A	5.2 (4.5)	9.2	12.5	16
• UL/CSA, at 50 °C	A	4.6 (4.0)	8.4	11.5	14
• At 60 °C	A	4.2 (3.5)	7.6	10.5	12.5
Power loss at I_{AC-53}					
• At 40 °C	W	10 (8)	16	22	28
Short-circuit protection with type of coordination "1" at an operational voltage of U_e to 440 V					
• Motor starter protector, type		3RV20 11-1GA10	3RV20 11-1JA10	3RV20 11-1KA10	3RV20 11-4AA10
• Current I_q	kA	50	5	5	3

1) The reduced values in brackets apply to a directly mounted circuit breaker and simultaneous butt-mounting.

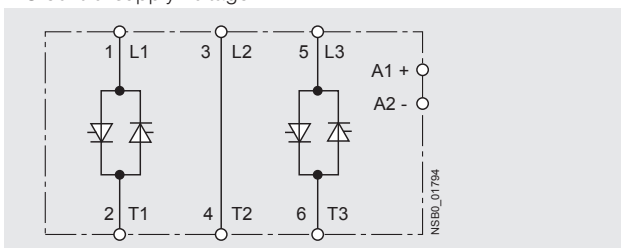
Type		3RF34 05-.BB.4	3RF34 05-.BB.6	3RF34 10-.BB..	3RF34 12-.BB.4	3RF34 12-.BB.6	3RF34 16-.BB..
Fused design with directly connected 3RB3 overload relay							
Rated operational current I_{AC-53} according to IEC 60947-4-2							
• At 40 °C	A	4		7.8	9.5		11
• UL/CSA, at 50 °C	A	3.6		7	8.5		10
• At 60 °C	A	3.2		6.2	7.6		9
Power loss at I_{AC-53}							
• At 40 °C	W	7		13	16		18
Minimum load current	A	0.5					
Max. off-state current	mA	10					
Rated peak withstand current I_{tsm}	A	200	600	600	1200	1150	1150
I^2t value	A ² s	200	1800	1800	7200	6600	6600

Type		3RF34 ..-.BB.4	3RF34 ..-.BB.6
Main circuit			
Controlled phases		2-phase	2-phase
Rated operational voltage U_e	V AC	48 ... 480	48 ... 600
• Operating range	V AC	40 ... 506	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %	50/60 ± 10 %
Rated insulation voltage U_i	V	600	600
Rated impulse withstand voltage U_{imp}	kV	6	6
Blocking voltage	V	1200	1600
Rate of voltage rise	V/μs	1000	1000

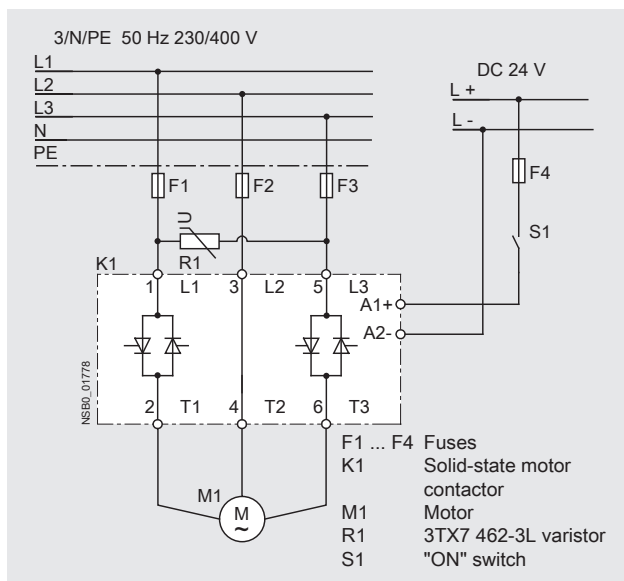
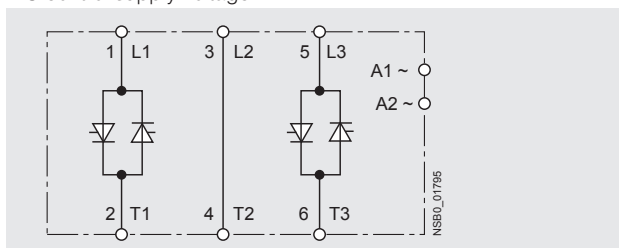
Type	3RF34 ...BB0.	3RF34 ...BB2.
Control circuits		
Method of operation	DC operation	AC operation
Rated control supply voltage U_s	V 24 acc. to IEC 61131-2	110 ... 230
Rated frequency of the control supply voltage	Hz --	50/60 \pm 10 %
Control supply voltage, max.	V 30	253
Typical actuating current	mA 20	15
Response voltage	V 15	90
Drop-out voltage	V 5	< 40
Operating times		
• ON-delay	ms 1	5
• OFF-delay	ms 1 + max. one half-wave	30 + max. one half-wave

Circuit diagrams

DC control supply voltage



AC control supply voltage



Solid-State Switching Devices

Solid-State Contactors

3RF34 Solid-state reversing contactors technical data

Overview

The integration of four conducting paths to a reverse switch, combined in one enclosure makes this device a particularly compact solution. Compared to conventional systems, for which two contactors are required, it is possible to save up to 50 %

width with the three-phase reversing contactors. Devices with 45 mm width cover motors up to 2.2 kW – and those with 90 mm width up to 3 kW.

Technical specifications

Type		3RF34 03-.BD.4	3RF34 05-.BD.4	3RF34 10-.BD.4
Fuseless design with 3RV2 motor starter protector, CLASS 10				
Rated operational current I_{AC-53}¹⁾ according to IEC 60947-4-2				
• At 40 °C	A	3.8 (3.4)	5.4 (4.8)	7.4
• UL/CSA, at 50 °C	A	3.5 (3.1)	5 (4.3)	6.8
• At 60 °C	A	3.2 (2.8)	4.6 (3.8)	6.2
Power loss at I_{AC-53} • At 40 °C				
	W	7 (6)	9 (8)	13
Short-circuit protection with type of coordination "1" at an operational voltage of U_0 to 440 V				
• Motor starter protector, type		3RV20 11-1FA10	3RV20 11-1GA10	3RV20 11-1JA10
• Current I_q	kA	50	50	10

¹⁾ The reduced values in brackets apply to a directly mounted circuit breaker and simultaneous butt-mounting.

Type		3RF34 03-.BD.4	3RF34 05-.BD.4	3RF34 10-.BD.4
Fused design with directly connected 3RB3 overload relay				
Rated operational current I_{AC-53} according to IEC 60947-4-2				
• At 40 °C	A	3.8	5.4	7.4
• UL/CSA, at 50 °C	A	3.5	5	6.8
• At 60 °C	A	3.2	4.6	6.2
Power loss at I_{AC-53} • At 40 °C				
	W	6	8	16
Minimum load current	A	0.5		
Max. off-state current	mA	10		
Rated peak withstand current I_{tsm}	A	200	600	
I^2t value	A ² s	200	1800	

Type		3RF34 ...-.BD.4
Main circuit		
Controlled phases		
		2-phase
Rated operational voltage $U_0$¹⁾		
• Operating range	V AC	48 ... 480
• Rated frequency	Hz	50/60 ± 10 %
Rated insulation voltage U_i	V	600
Rated impulse withstand voltage U_{imp}	kV	6
Blocking voltage	V	1 200
Rate of voltage rise	V/μs	1 000

¹⁾ To reduce the risk of a phase short circuit due to overvoltage, we recommend using a varistor type 3TX7 462-3L between the phases L1 and L3 and as close as possible to the switchgear.

We recommend a design with semiconductor protection as short-circuit protection.

Solid-State Switching Devices

Solid-State Contactors

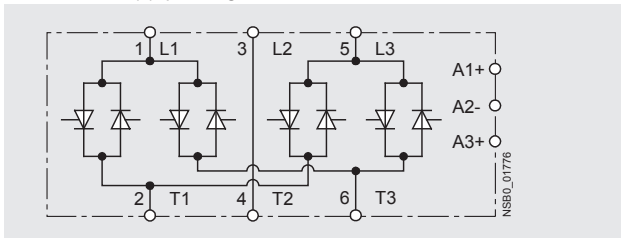
3RF34 Solid-state reversing contactors technical data

Type	3RF34 ...BD0.	3RF34 ...BD2.
Control circuits		
Method of operation	DC operation	AC operation
Rated control supply voltage U_s	V	110 ... 230
Rated frequency of the control supply voltage	Hz	50/60 \pm 10 %
Control supply voltage, maximum	V	253
Typical actuating current	mA	10
Response voltage	V	90
Drop-out voltage	V	< 40
Operating times¹⁾		
• ON-delay	ms	5
• OFF-delay	ms	5 + max. one half-wave
• Interlocking time	ms	60 ... 100

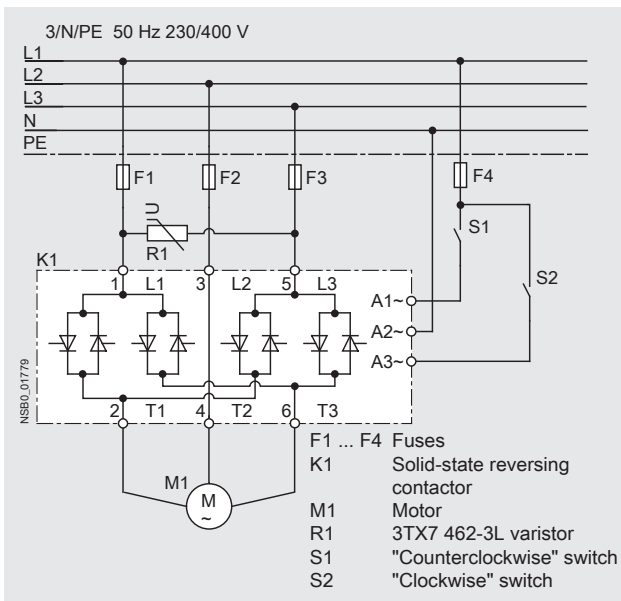
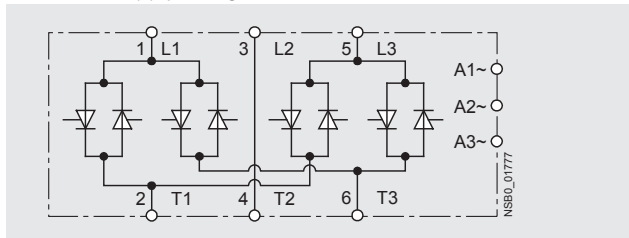
¹⁾ Caution! Risk of phase short circuit in automatic mode.
The control inputs must not be actuated until after a delay time of 40 ms after the main voltage is applied

Circuit diagrams

DC control supply voltage



AC control supply voltage



Solid-State Switching Devices

Function Modules

General and technical data

Overview

Function modules for SIRIUS SC semiconductor switching devices

A great variety of applications demand an expanded range of functionality. These applications can easily be met with Sirius SC function modules. The modules are mounted simply by clicking them into place; straight away the necessary connections are made with the semiconductor relay or contactor.

The plug-in connection to control the semiconductor switching devices can simply remain in use.

The following function modules are available:

- Converter
- Load monitors (basic and enhanced)
- Power controller

Technical specifications

Type		3RF29 ...E...	3RF29 ...F...	3RF29 ...G...	3RF29 ...H...
General data					
Ambient temperature					
during operation, derating at 40 °C	°C	-25 ... +60			
when stored	°C	-55 ... +80			
Site altitude	m	0 ... 1000; derating from 1000			
Shock resistance acc. to IEC 60068-2-27	g/ms	15/11			
Vibration resistance acc. to IEC 60068-2-6	g	2			
Degree of protection		IP20			
Electromagnetic compatibility (EMC)					
Emitted interference					
• Conducted interference voltage acc. to IEC 60947-4-3		Class A for industrial applications ¹⁾			
• Emitted, high-frequency interference voltage acc. to IEC 60947-4-3		Class A for industrial applications			
Noise immunity					
• Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2			
• Induced RF fields acc. to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBμV; behavior criterion 1			
• Burst acc. to IEC 61000-4-4		2 kV/5.0 kHz; behavior criterion 1			
• Surge acc. to IEC 61000-4-5	kV	Conductor - ground 2; conductor - conductor 1; behavior criterion 2			
Connection, auxiliary/control contacts, screw connection					
Conductor cross-section	mm ²	1x (0.5 ... 2.5); 2x (0.5 ... 1) AWG 20 ... 12			
• Insulation stripping length	mm	7			
Terminal screw		M3			
• Tightening torque	Nm	0.5 ... 0.6			
Converter diameter of hole	mm	-	7	17	

1) Note limitations for power controller function module on page 2/31.

Type		3RF29 ...E..8	3RF29 ...F..8	3RF29 ...G..3	3RF29 ...G..6	3RF29 ...H..3	3RF29 ...H..6
Main circuit							
Rated operational voltage U_e	V	1)		110 ... 230	400 ... 600	110 ... 230	400 ... 600
• Tolerance	%	-		-15 / +10			
• Rated frequency	Hz	-		50/60			
Rated insulation voltage U_i	V	-		600			
Voltage detection							
Measuring range	V	-		93.5 ... 253	340 ... 660	93.5 ... 253	340 ... 660
Mains voltage fluctuation compensation	%	-		20			

1) Versions do not depend on main circuit.

Type		3RF29 ...0.	3RF29 ...1.	3RF29 ...3.
Control circuit				
Method of operation				
DC operation				
AC/DC operation				
AC operation				
Rated control supply voltage U_s	V	24	24	110
Rated operating current	mA	15	15	15
Max. rated control voltage	V	30	30	121
Rated control current at maximum voltage	mA	15	15	15
Rated frequency of the control supply voltage	Hz	-	50/60	50/60
Response voltage for tripping current	V	15	15	90
	mA	2	2	2
Drop-out voltage	V	5	5	-

Type		3RF29 2-.F...	3RF29 2-.G...	3RF29 2-.H...	3RF29 5-.G...	3RF29 5-.H...	3RF29 9-.G...	3RF29 9-.H...
Current detection								
Rated operational current I_e	A	20			50		90	
Measuring range	A	4 ... 22			4 ... 55		4 ... 99	
Number of partial loads		6	12	-	12	-	12	-

Overview

Function modules for SIRIUS SC solid-state switching devices

A great variety of applications demand an expanded range of functionality. With our function modules, these requirements can be met really easily. The modules are mounted simply by clicking them into place; straight away the necessary connections are made with the solid-state relay or contactor. The plug-in connection to control the solid-state switching devices can simply remain in use.

The following function modules are available:

- Converter
- Load monitoring
- Heating current monitoring
- Power control regulators
- Power controller

Technical specifications

Type	3RF29 ...K...		
General data			
Ambient temperature			
• During operation, derating from 40 °C	°C	-25 ... +60	
• During storage	°C	-55 ... +80	
Site altitude	m	0 ... 1000; derating from 1000	
Shock resistance acc. to IEC 60068-2-27	g/ms	15/11	
Vibration resistance acc. to IEC 60068-2-27	g	2	
Degree of protection		IP20	
Insulation resistance between load and control circuit	MΩ	1.5	
Electromagnetic compatibility (EMC)			
• Emitted interference			
- Conducted interference voltage acc. to IEC 60947-4-3		Class A for industrial applications ¹⁾	
- Emitted, high-frequency interference voltage acc. to IEC 60947-4-3		Class A for industrial applications	
• Interference immunity			
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge 4; air discharge 8; behavior criterion 2	
- Induced RF fields acc. to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBμV; behavior criterion 1	
- Burst acc. to IEC 61000-4-4		2 kV/5.0 kHz; behavior criterion 1	
- Surge acc. to IEC 61000-4-5	kV	Conductor – ground 2; conductor – conductor 1; behavior criterion 2	
Connection, auxiliary/control contacts, screw terminal			
• Conductor cross-section	mm ²	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0), 1 x (AWG 20 ... 12)	
• Stripped length	mm	7	
• Terminal screw		M3	
- Tightening torque	Nm lb.in	0.5 ... 0.6 4.5 ... 5.3	
Converter, diameter of hole	mm	17	

1) These products were built as Class A devices. The use of these devices in residential areas could result in radio interference. In this case the user may require to introduce additional damping measures.

Solid-State Switching Devices

3RF29 Function Modules

Power control regulators

Technical specifications

Type		3RF29 ...0KA.3	3RF29 ...0KA.6
Main circuit			
Rated operational voltage U_e	V	110 ... 230	400 ... 600
• Tolerance	%	-15/+10	
• Rated frequency	Hz	50/60	
Rated insulation voltage U_i	V	600	
Voltage detection			
• Measuring/teach range	V	93.5 ... 253	340 ... 660
Compensation of mains voltage fluctuation	%	20 (only within the measuring range)	

Type		3RF29 04-0KA..	3RF29 20-0KA..	3RF29 50-0KA..	3RF29 90-0KA..
Current measurement					
Rated operational current I_e	A	4	20	50	90
Current measurement					
• Teach range	A	0.15 ... 4	0.65 ... 20	1.6 ... 50	2.9 ... 90
• Measuring range	A	0 ... 4	0 ... 22	0 ... 55	0 ... 99
• Minimum partial load current	A	--	0.65	1.6	2.9
Number of partial loads			1 ... 6		

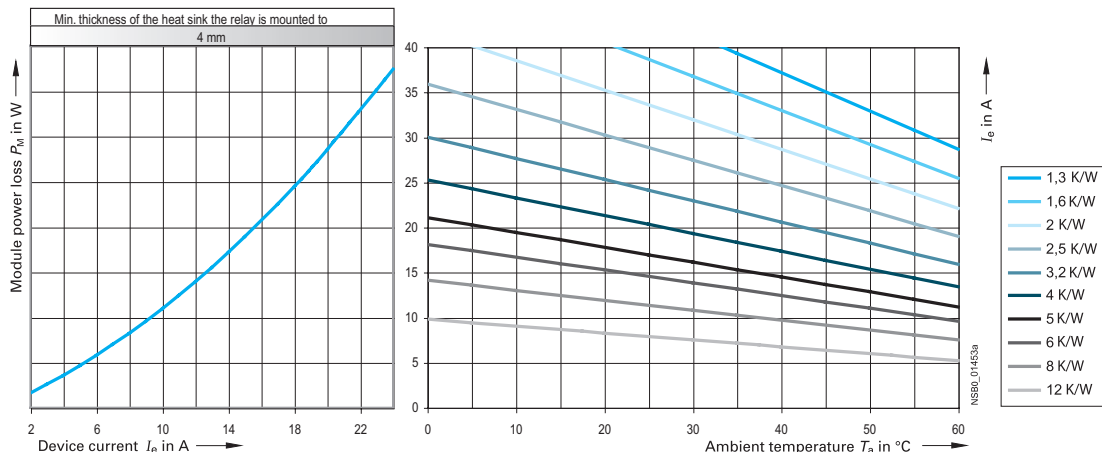
Type		3RF29 ...0KA1.	3RF29 ...0KA3.
Control circuit A1–A2			
General data			
Rated control supply voltage U_s	V	24 AC/DC	AC 110
• Operating range	V	20.5 ... 26.5	DC 18 ... 30
Rated frequency of the control supply voltage	Hz	50/60 ± 10%	--
Current consumption	mA	< 40	< 20
Control input IN			
Rated control voltage U_c	V	24 AC/DC	AC 110
• For actuating current	mA	< 15	< 15
• Actuating voltage, max.	mA	AC 26.5	DC 30
Control supply voltage, min./max.	V	AC 20.5 ... 26.5	DC 18 ... 30
Response voltage	V	AC 14	DC 15
• For tripping current	mA	> 2	> 2
Drop-out voltage	V	5	5
Control input 0 ... 10 V			
Input analog	V	0 ... 10	
• Permissible range	V	-1 ... 11	
Input resistance	kΩ	8	
Period duration	s	1	
Auxiliary circuit 11–12			
Switching voltage	V	24 AC/DC	AC 110
• Actuating current (utilization category)	A	0.5 (DC-12)	0.5 (AC-12)
• Switching voltage, min./max.	V	15 ... 30	90 ... 121
Continuous thermal current, max. I_{th}	A	1	1

Characteristics

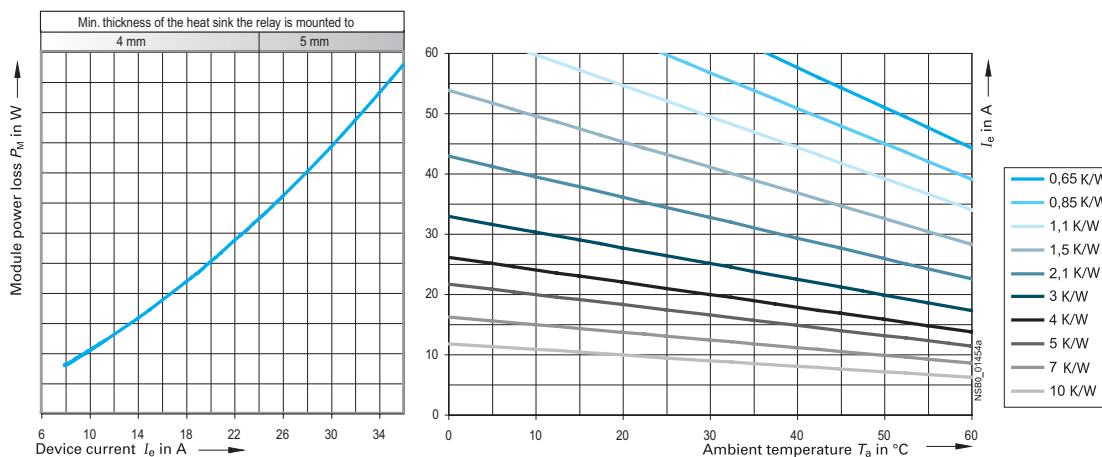
SIRIUS SC semiconductor relays

Dependence of the device current I_e on the ambient temperature T_a (Chart data for SIRIUS SC relays based on I max)

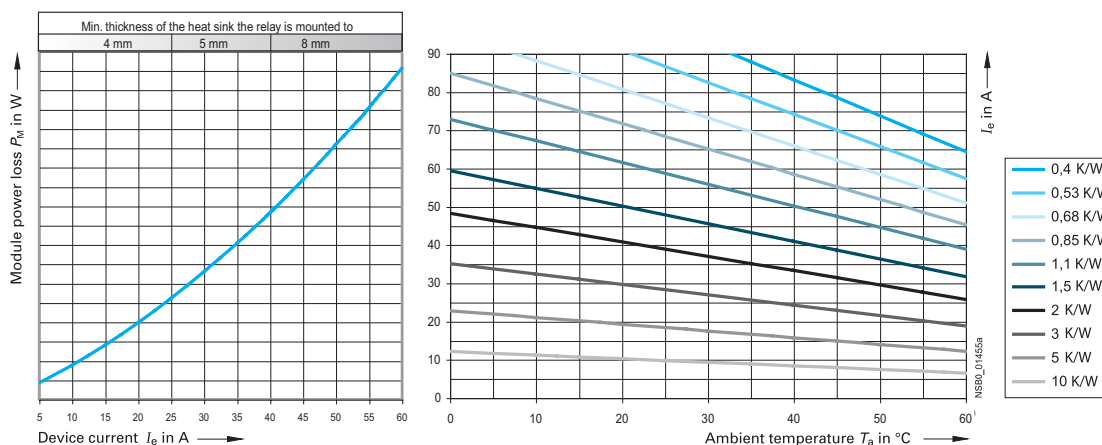
SIRIUS SC semiconductor relay with 20 A type current (3RF21 20/3RF20 20)¹⁾



SIRIUS SC semiconductor relay with 30 A type current (3RF21 30/3RF20 30)



SIRIUS SC semiconductor relay with 50 A type current (3RF21 50/3RF20 50)



1) Arrangement example for $I_e = 20$ A and $T_a = 40$ °C:
The task is to find the thermal resistance R_{thha} and the heat-sink overtemperature dT_{ha} . From the diagram on the left $P_M = 28$ W, from the diagram on the right $R_{thha} = 1.7$ K/W.

This results in: $dT_{ha} = R_{thha} \times P_M = 1.7$ K/W \times 28 W = 47.6 K. At $dT_{ha} = 47.6$ K the heat sink must therefore have an $R_{thha} = 1.7$ K/W.
(Chart data for SIRIUS SC relays based on I max)

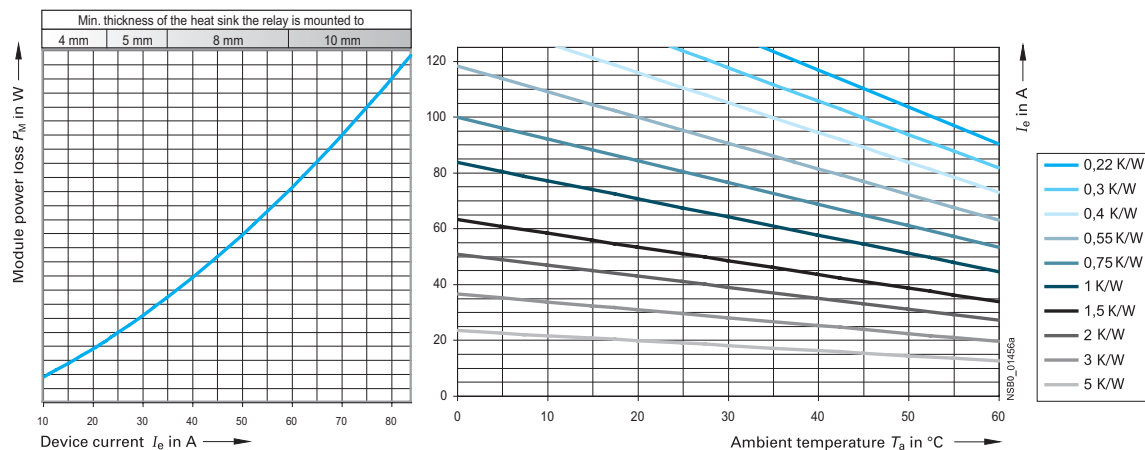
Solid-State Switching Devices

Semiconductor Relays and Contactors, Function Modules

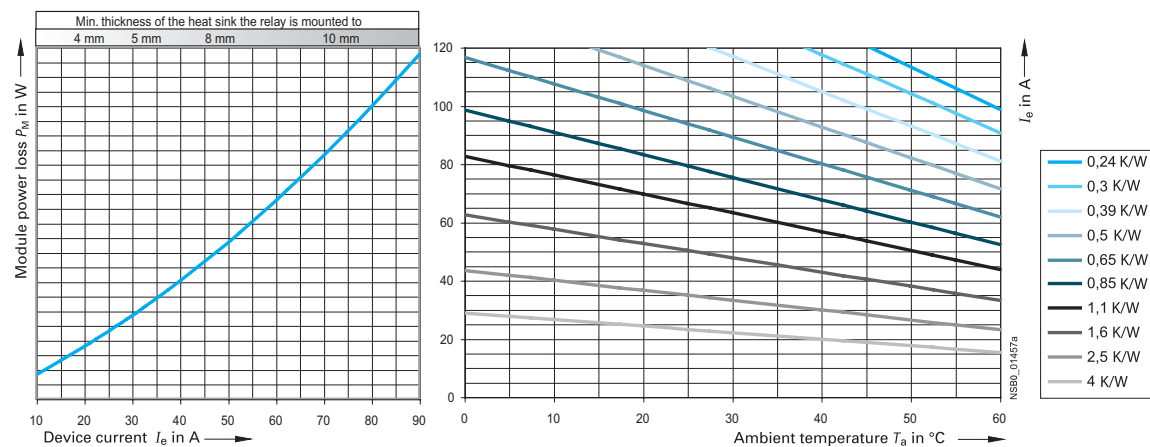
Project planning aids

Dependence of the device current I_e on the ambient temperature T_a (Chart data for SIRIUS SC relays based on I_{max})

SIRIUS SC semiconductor relay with 70 A type current (3RF21 70/3RF20 70)



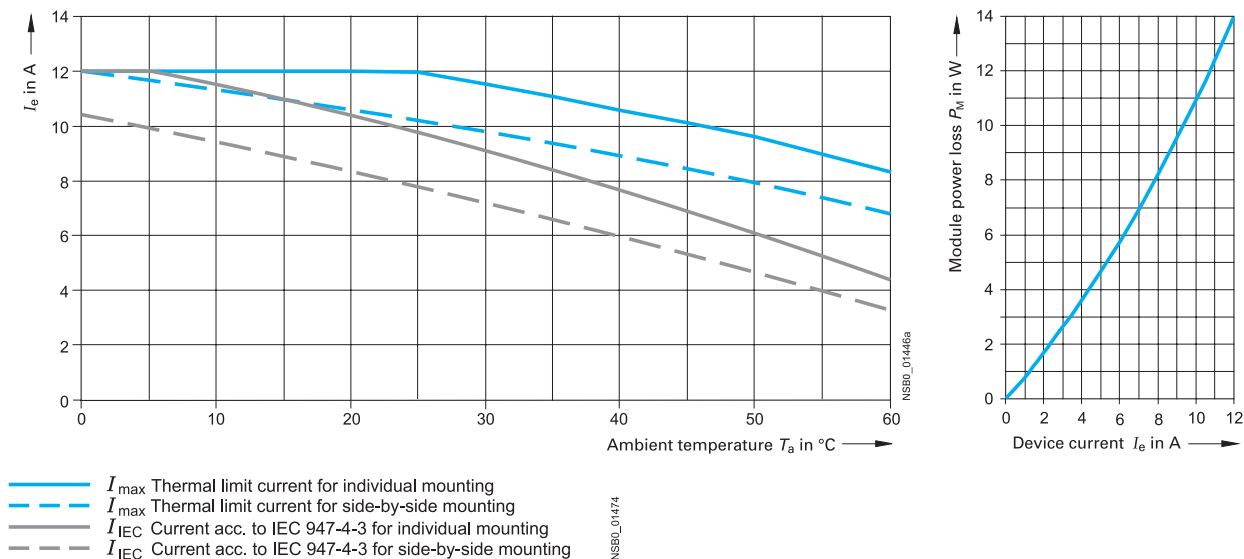
SIRIUS SC semiconductor relay with 88 A type current (3RF21 90/3RF20 90)



SIRIUS SC semiconductor contactors

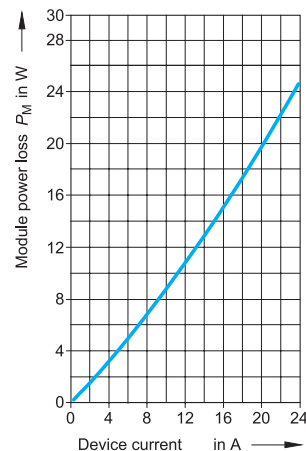
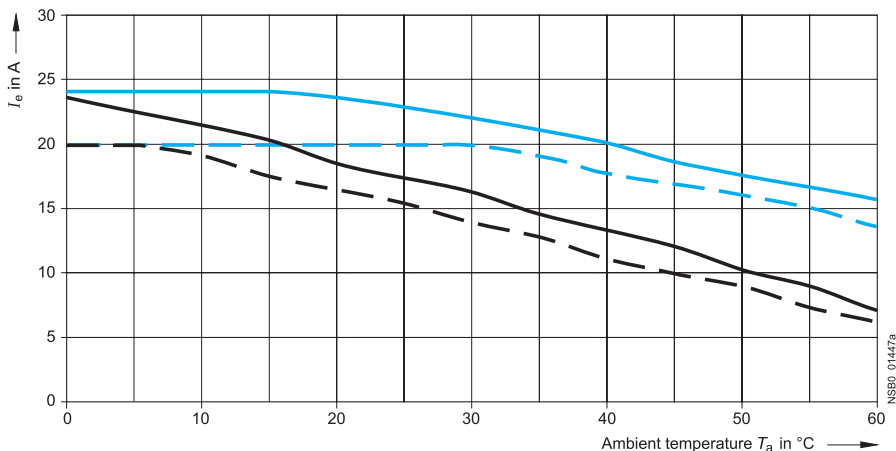
Derating curves

SIRIUS SC semiconductor contactor with 10 A type current (3RF23 10)

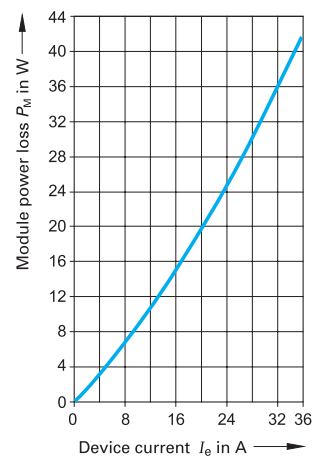
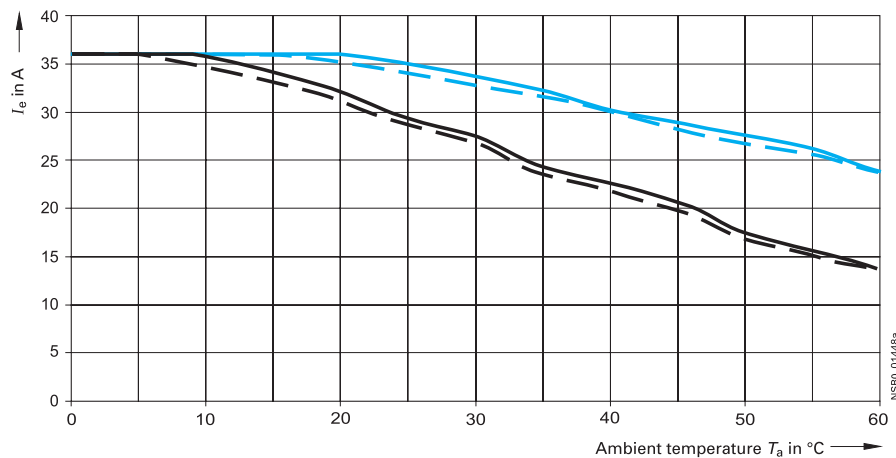


Derating curves

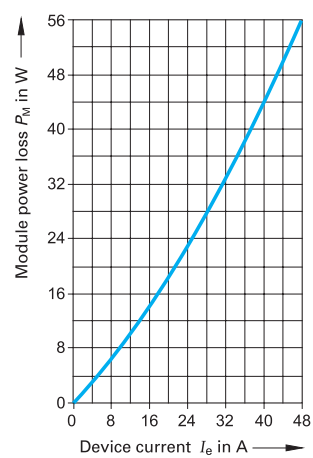
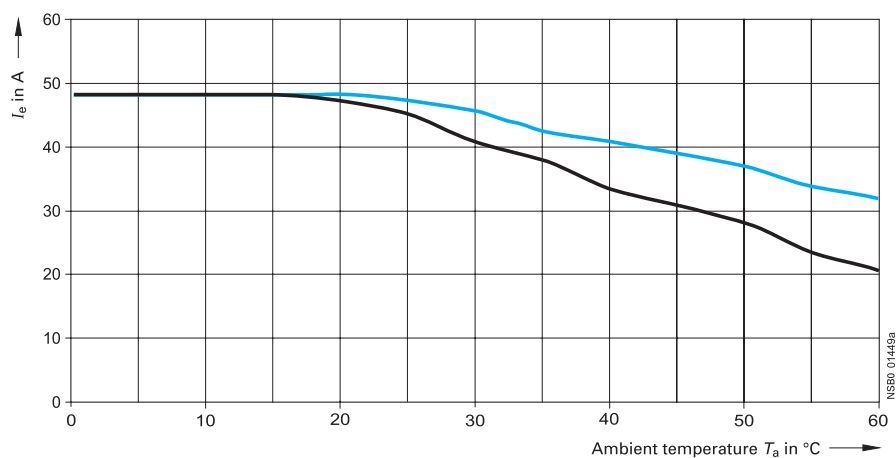
SIRIUS SC semiconductor contactor with 20 A type current (3RF23 20)



SIRIUS SC semiconductor contactor with 30 A type current (3RF23 30)



SIRIUS SC semiconductor contactor with 40 A type current (3RF23 40)¹⁾



- I_{max} Thermal limit current for individual mounting
- - I_{max} Thermal limit current for side-by-side mounting
- I_{IEC} Current acc. to IEC 947-4-3 for individual mounting
- - I_{IEC} Current acc. to IEC 947-4-3 for side-by-side mounting

1) Identical current/temperature curves for individual and side-by-side mounting.

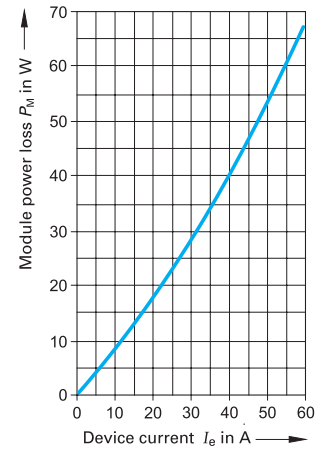
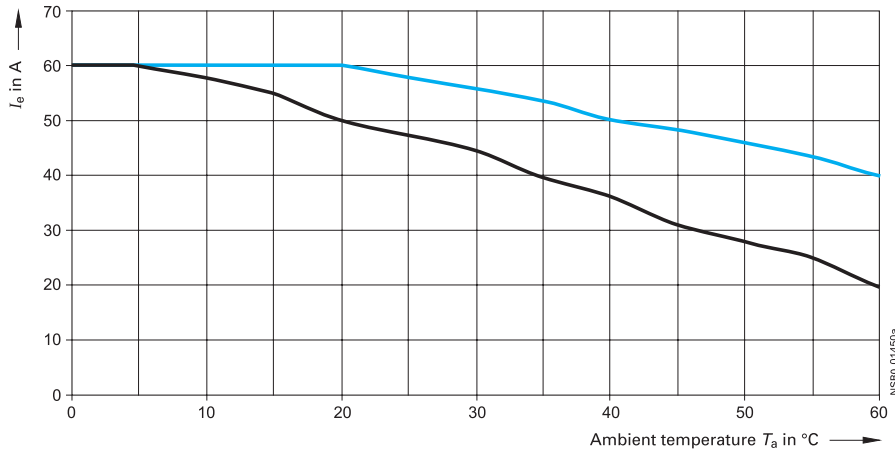
Solid-State Switching Devices

Semiconductor Relays and Contactors, Function Modules

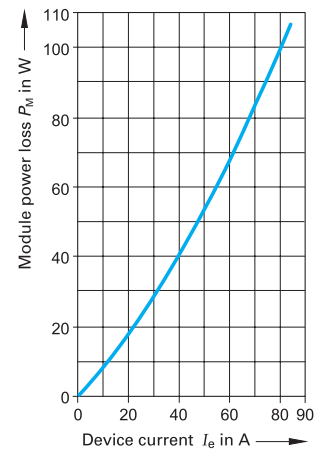
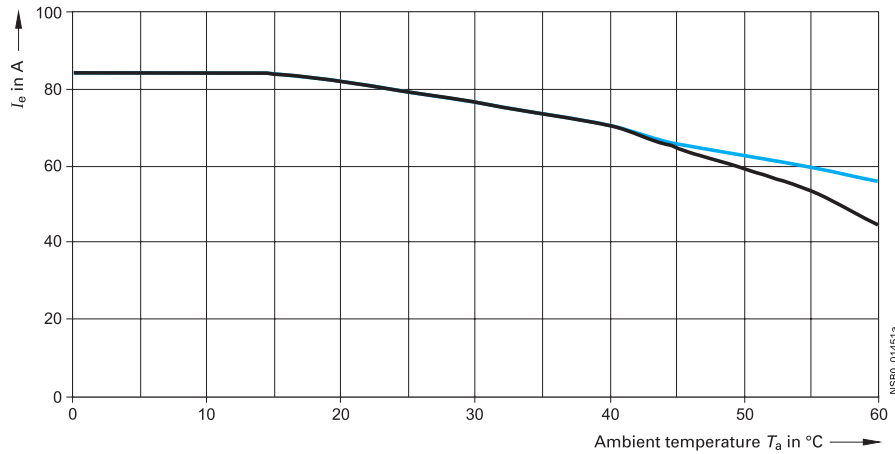
Project planning aids

Derating curves

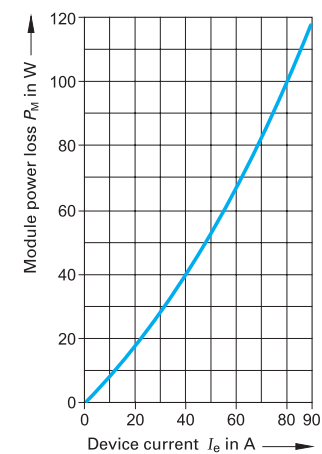
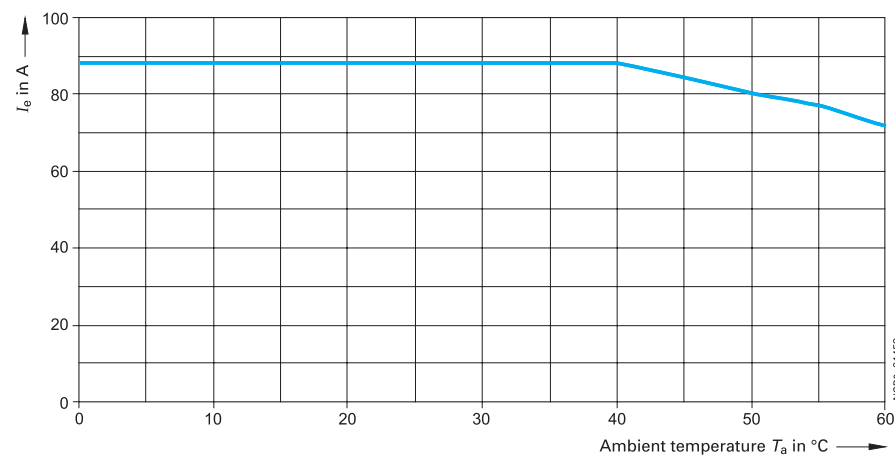
SIRIUS SC semiconductor contactor with 50 A type current (3RF23 50)¹⁾



SIRIUS SC semiconductor contactor with 70 A type current (3RF23 70)¹⁾



SIRIUS SC semiconductor contactor with 88 A type current (3RF23 90)¹⁾

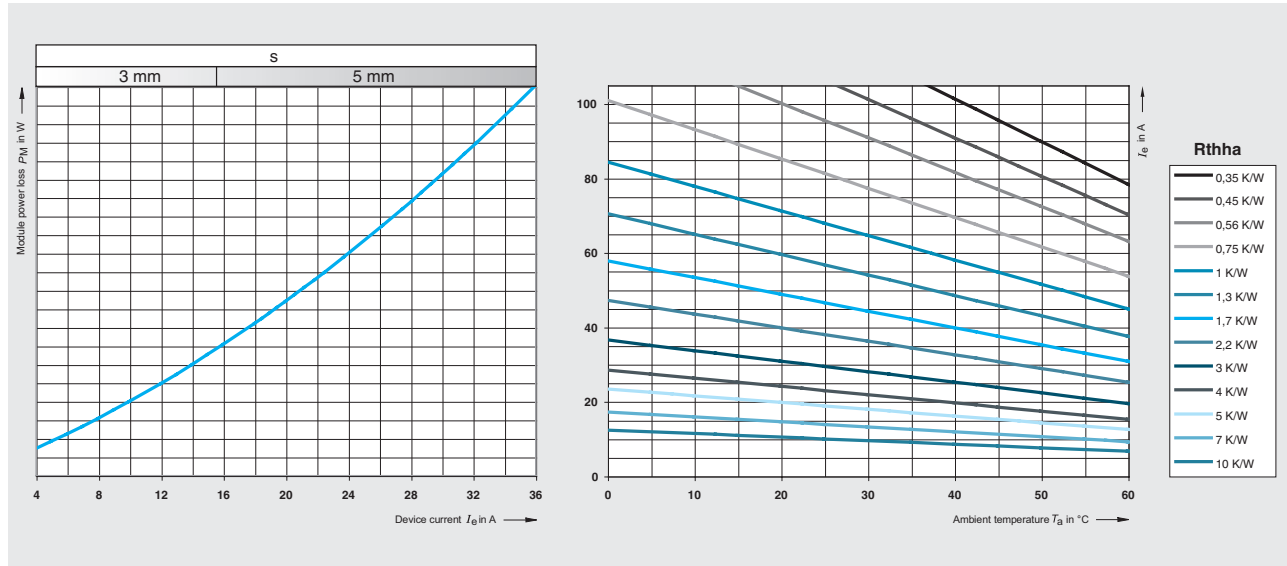


- I_{max} Thermal limit current for individual mounting
- I_{max} Thermal limit current for side-by-side mounting
- I_{IEC} Current acc. to IEC 947-4-3 for individual mounting
- I_{IEC} Current acc. to IEC 947-4-3 for side-by-side mounting

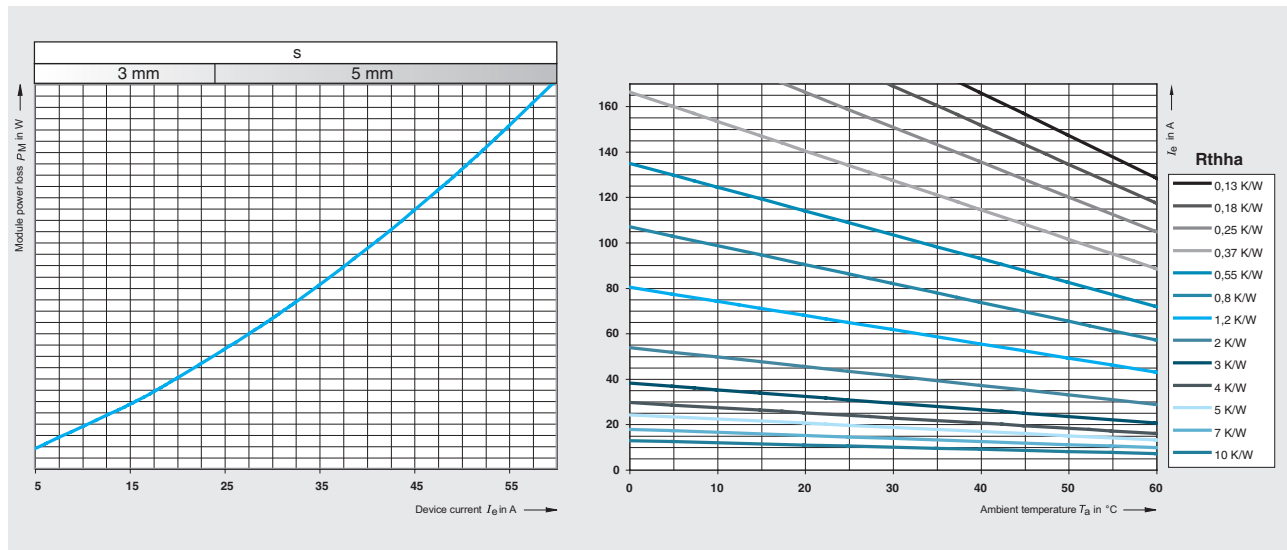
1) Identical current/temperature curves for individual and side-by-side mounting.

Characteristic curves

Dependence of the device current I_E on the ambient temperature T_A (two-phase controlled)



Type current 30 A (3RF22 30-AB..)



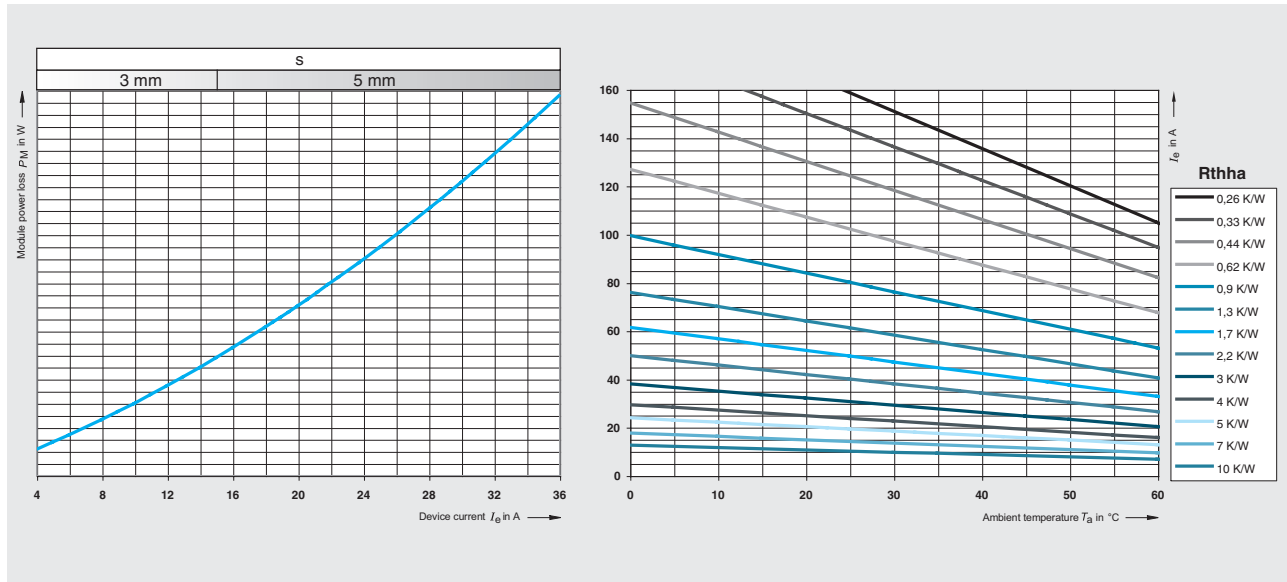
Type current 55 A (3RF22 55-AB..)

Solid-State Switching Devices

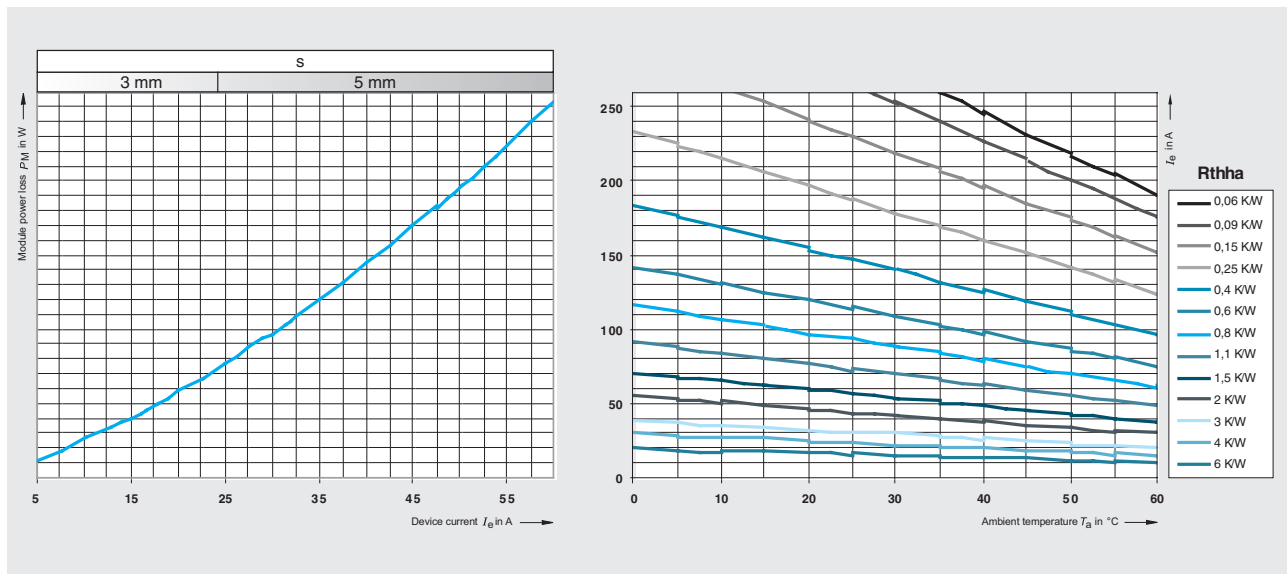
Solid-State Relays

3RF22 solid-state relays, 3-phase, 45 mm

Dependence of the device current I_e on the ambient temperature T_a (three-phase controlled)



Type current 30 A (3RF22 30-.AC..)



Type current 55 A (3RF22 55-.AC..)

Arrangement example

Given conditions: $I_e = 55$ A and $T_a = 40$ °C.

The task is to find the thermal resistance R_{thha} and the heat sink overtemperature dT_{ha} .

From the diagram on the left $\rightarrow P_M = 227$ W,
from the diagram on the right $\rightarrow R_{thha} = 0.09$ K/W.

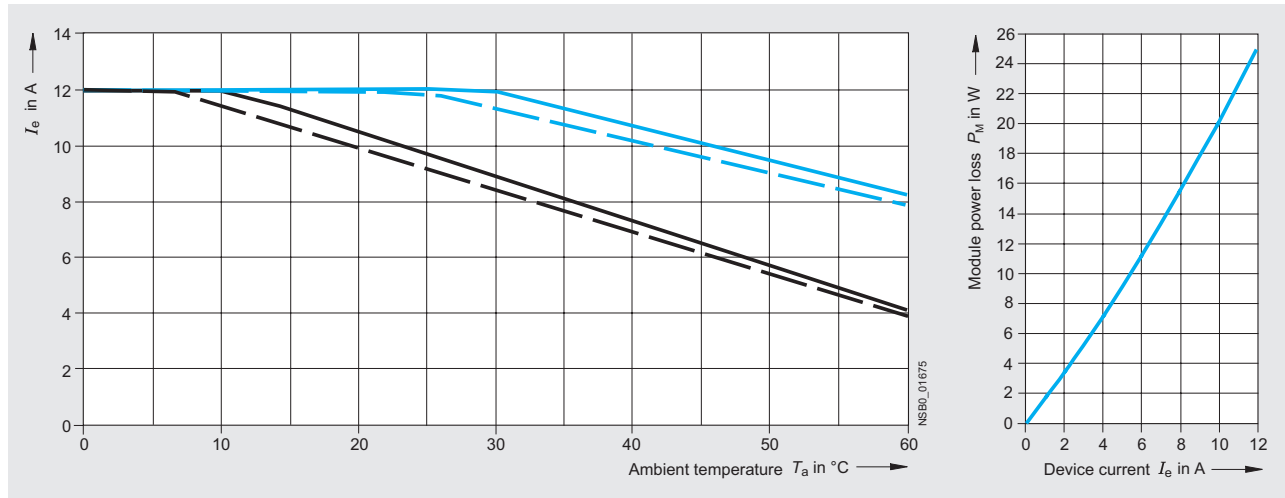
This results in:

$$dT_{ha} = R_{thha} \times P_M = 0.09 \text{ K/W} \times 227 \text{ W} = 20.4 \text{ K}.$$

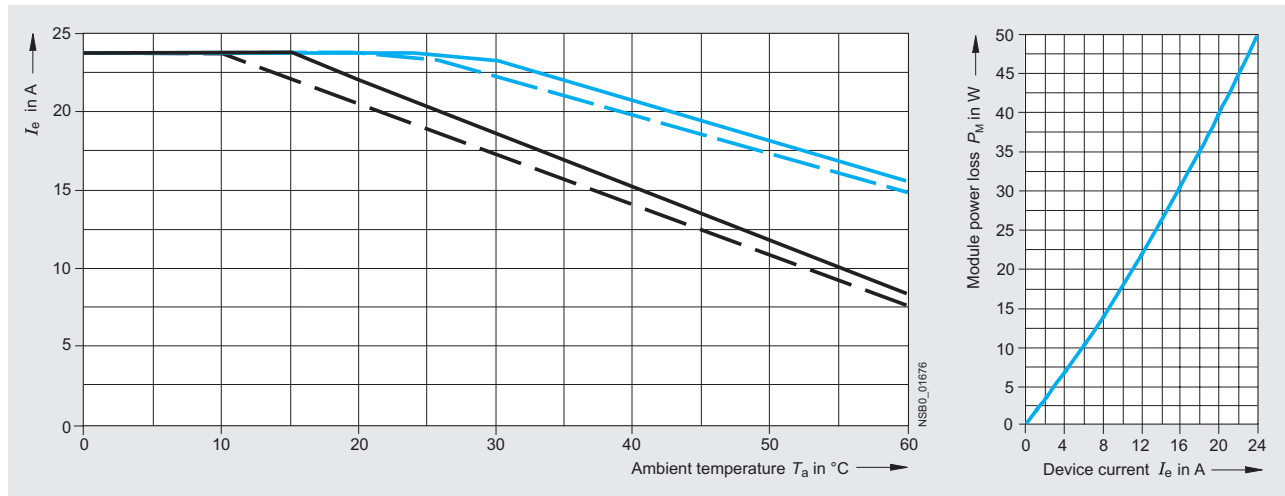
At $dT_{ha} = 20.4$ K the heat sink must therefore have an $R_{thha} = 0.09$ K/W.

Characteristic curves

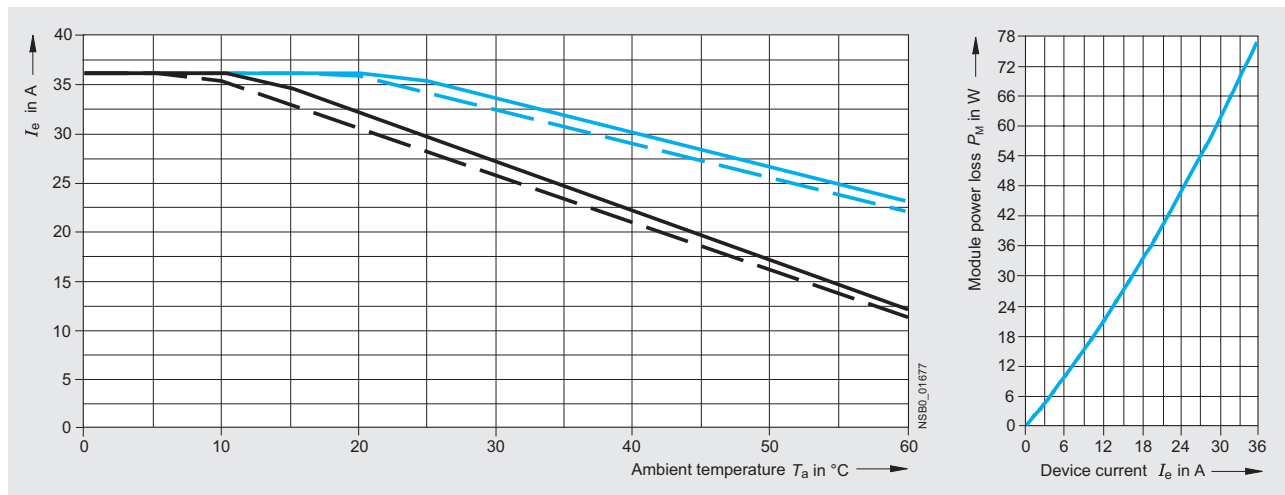
Derating curves, two-phase controlled



Type current 10.5 A (3RF24 10-AB..)



Type current 20 A (3RF24 20-AB..)

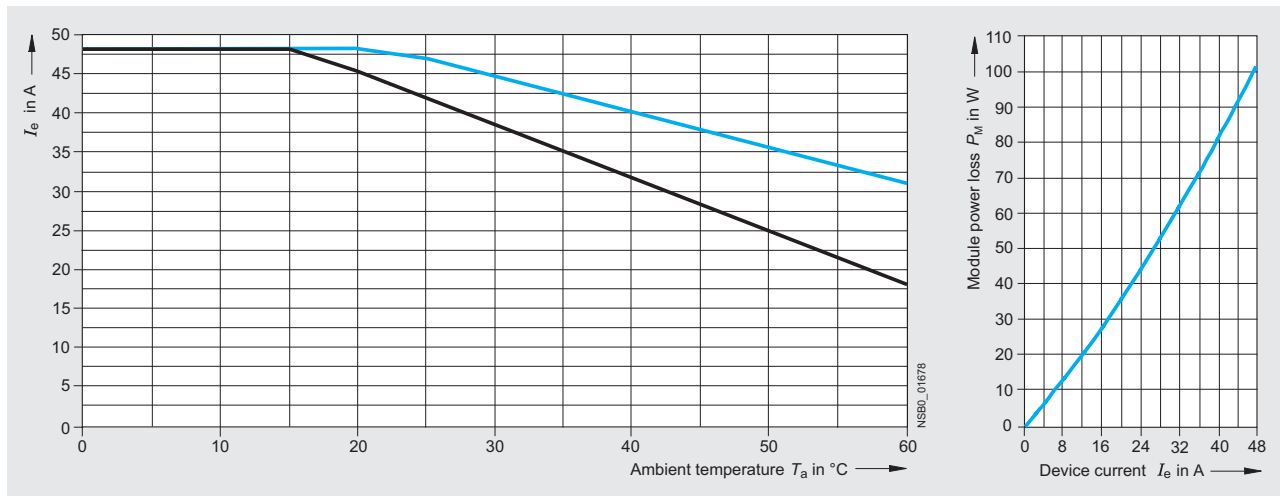


Type current 30 A (3RF24 30-AB..)

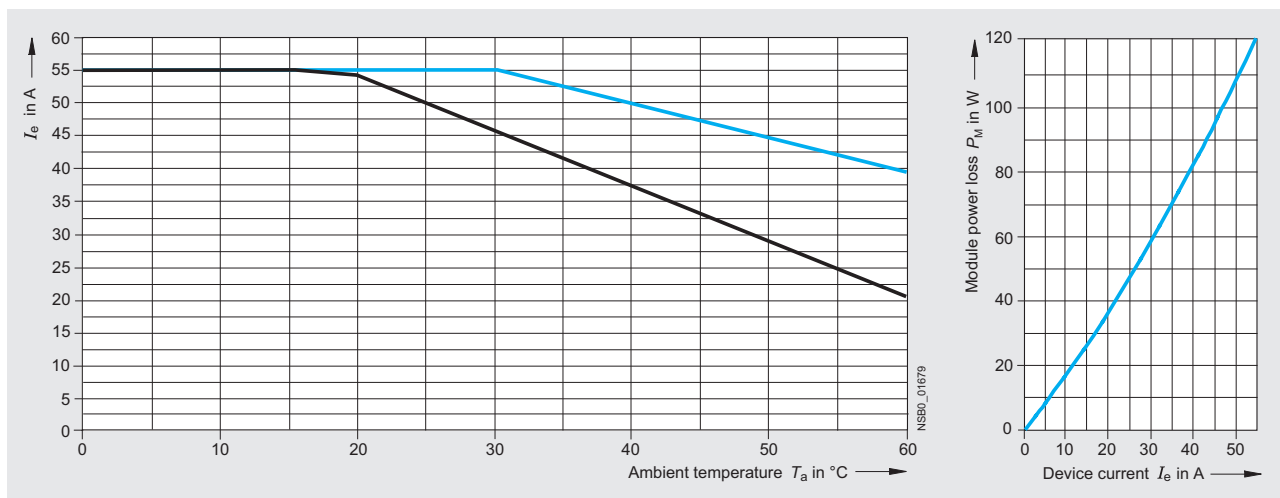
Solid-State Switching Devices

Solid-State Contactors

3RF24 solid-state contactors, 3-phase



Type current 40 A (3RF24 40-.AB..)¹)



Type current 50 A (3RF24 50-.AB..)¹)

- I_{\max} Thermal limit current for individual mounting
- - - I_{\max} Thermal limit current for side-by-side mounting
- I_{IEC} Current acc. to IEC 947-4-3 for individual mounting
- - - I_{IEC} Current acc. to IEC 947-4-3 for side-by-side mounting

¹) Identical current/temperature curves for stand-alone and side-by-side installation.

Solid-State Switching Devices

Solid-State Contactors

3RF24 solid-state contactors, 3-phase

1

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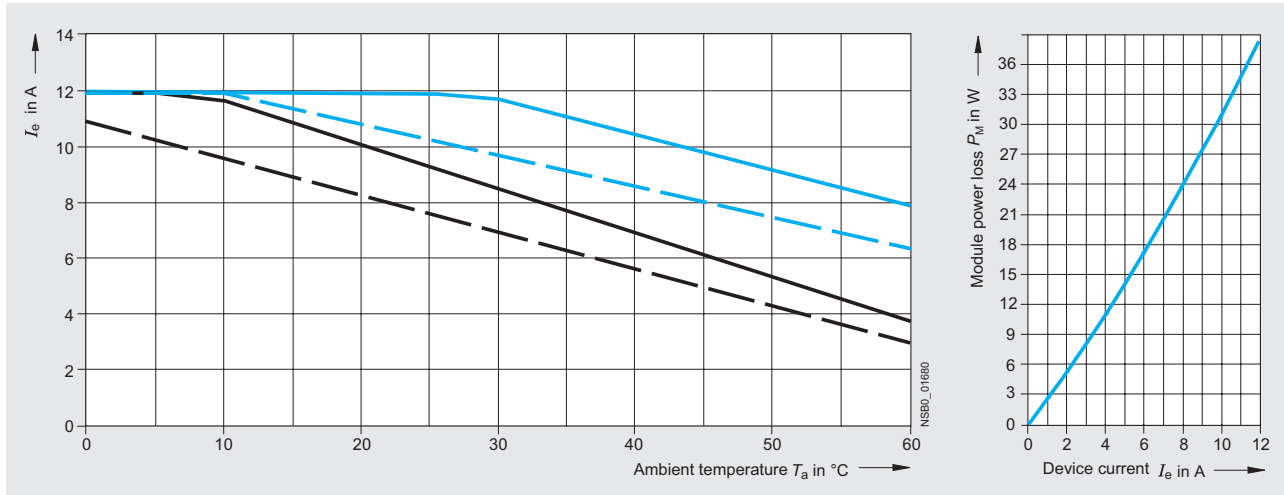
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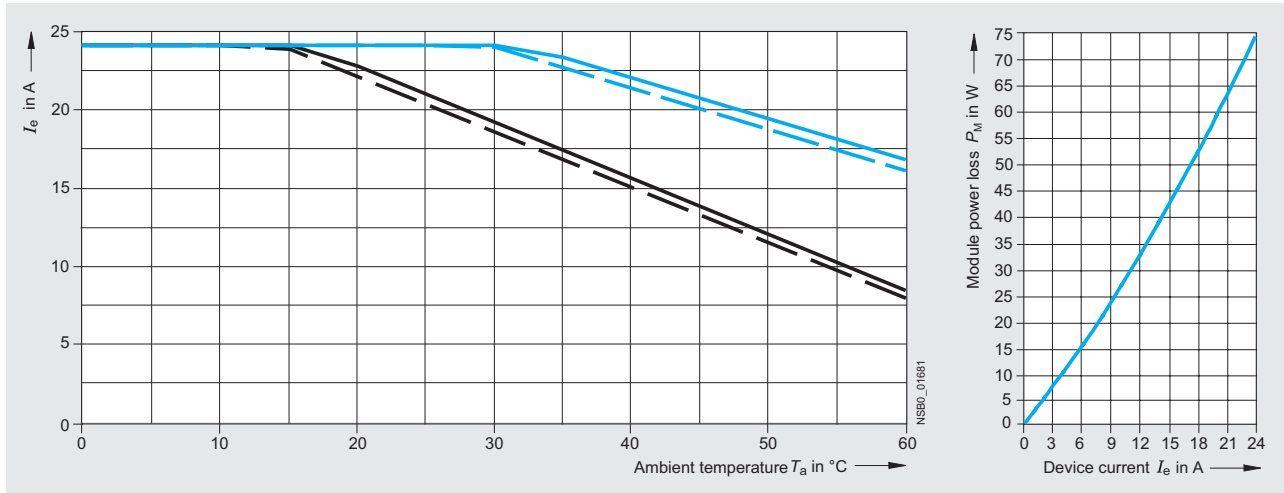
7

8

Derating curves, three-phase controlled

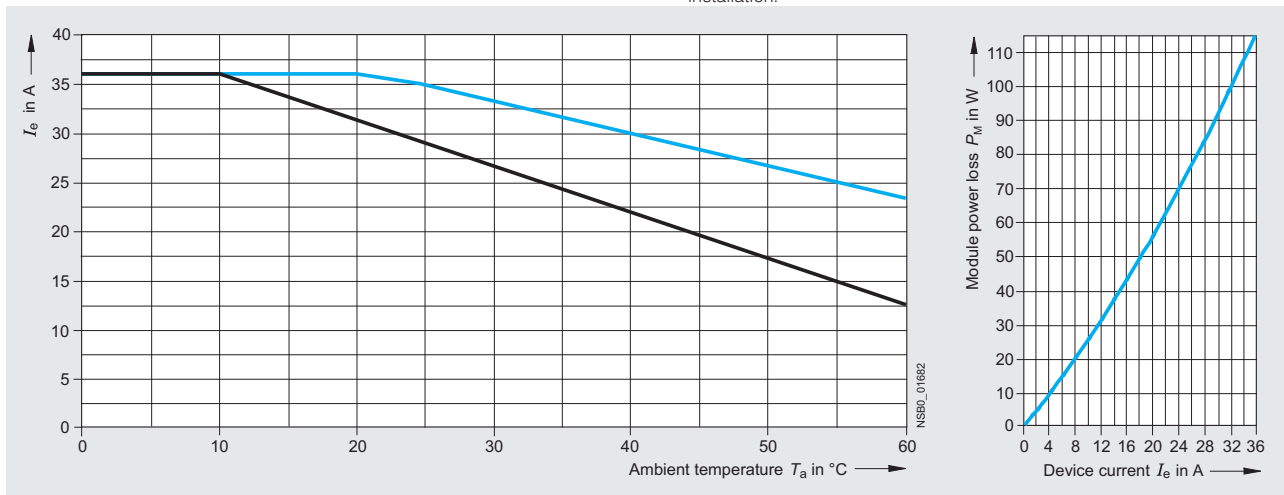


Type current 10.5 A (3RF24 10-AC..)



Type current 20 A (3RF24 20-AC..)

1) Identical current/temperature curves for stand-alone and side-by-side installation.



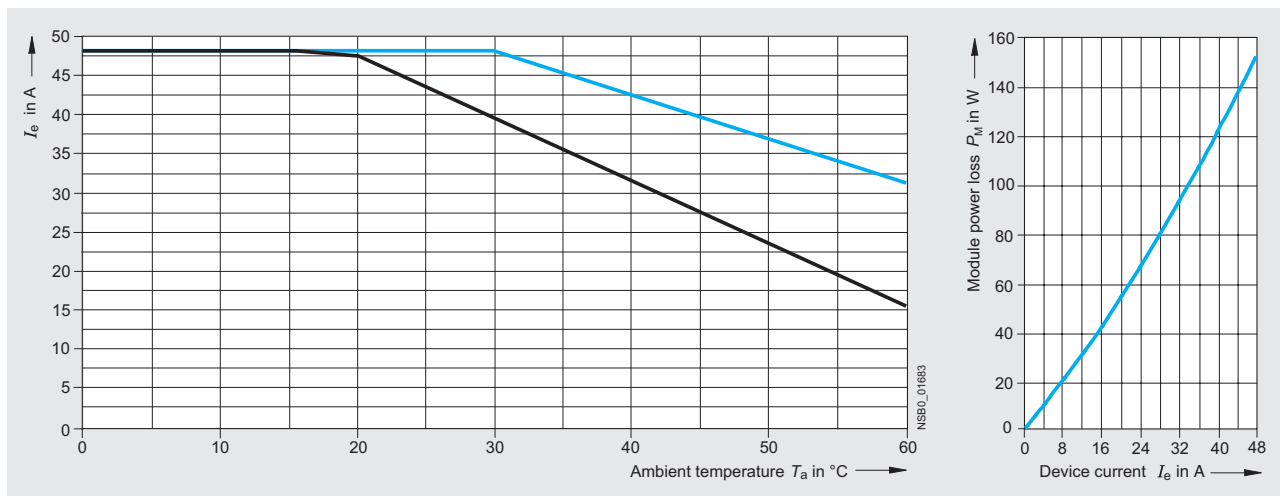
Type current 30 A (3RF24 30-AC..) ¹⁾

1) Identical current/temperature curves for stand-alone and side-by-side installation.

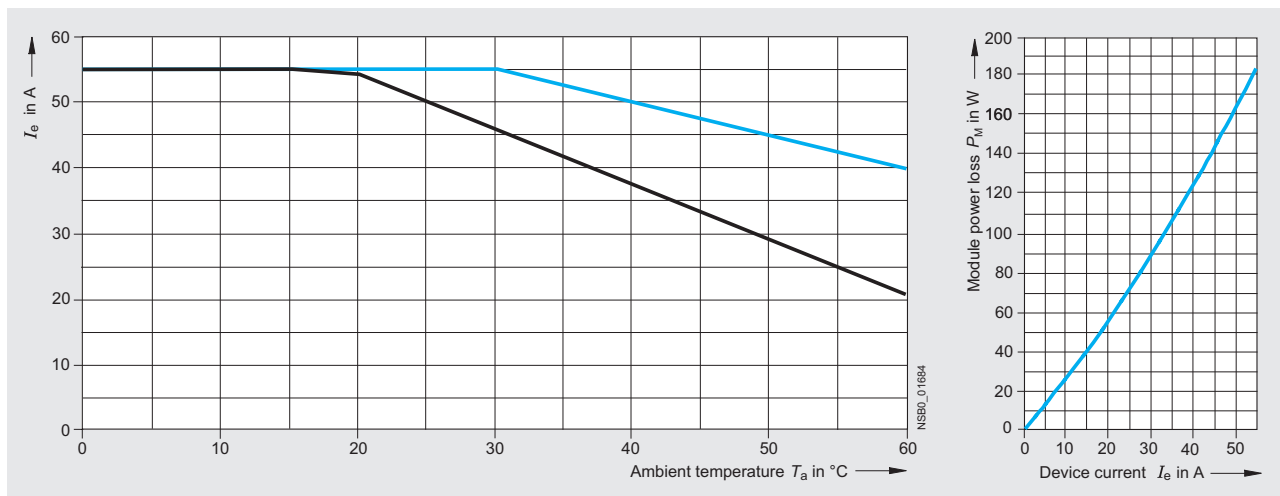
Solid-State Switching Devices

Solid-State Contactors

3RF24 solid-state contactors, 3-phase



Type current 40 A (3RF24 40-.AC..)¹)

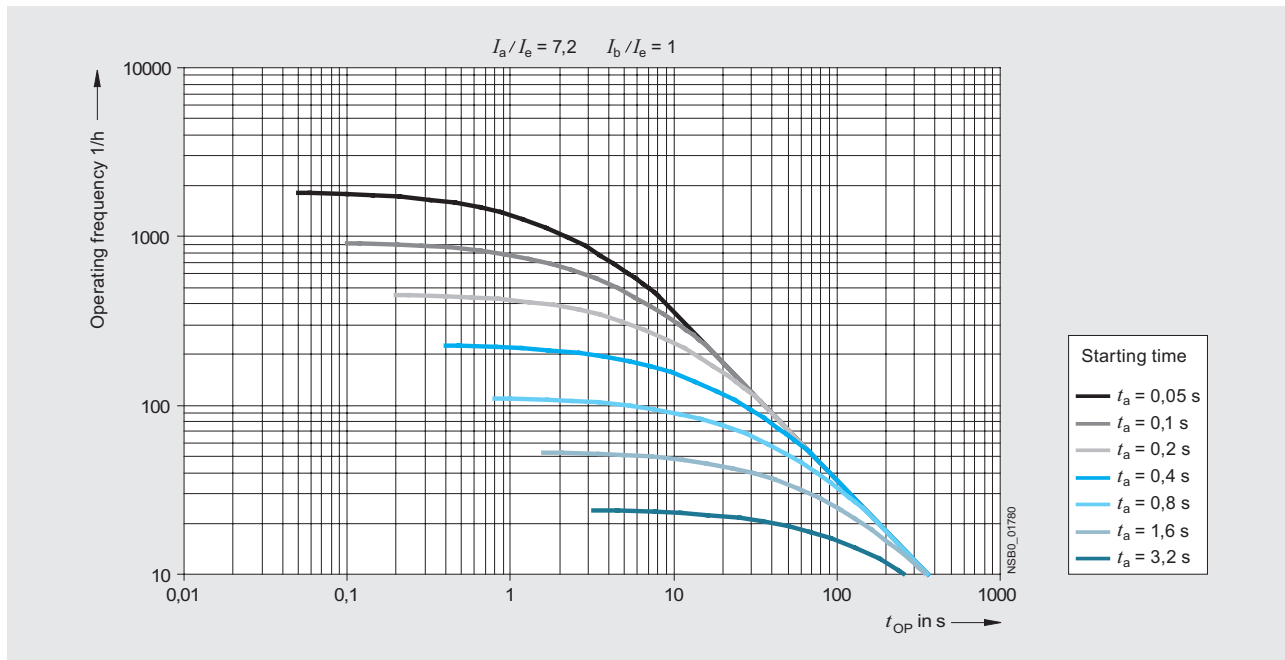


Type current 50 A (3RF24 50-.AC..)¹)

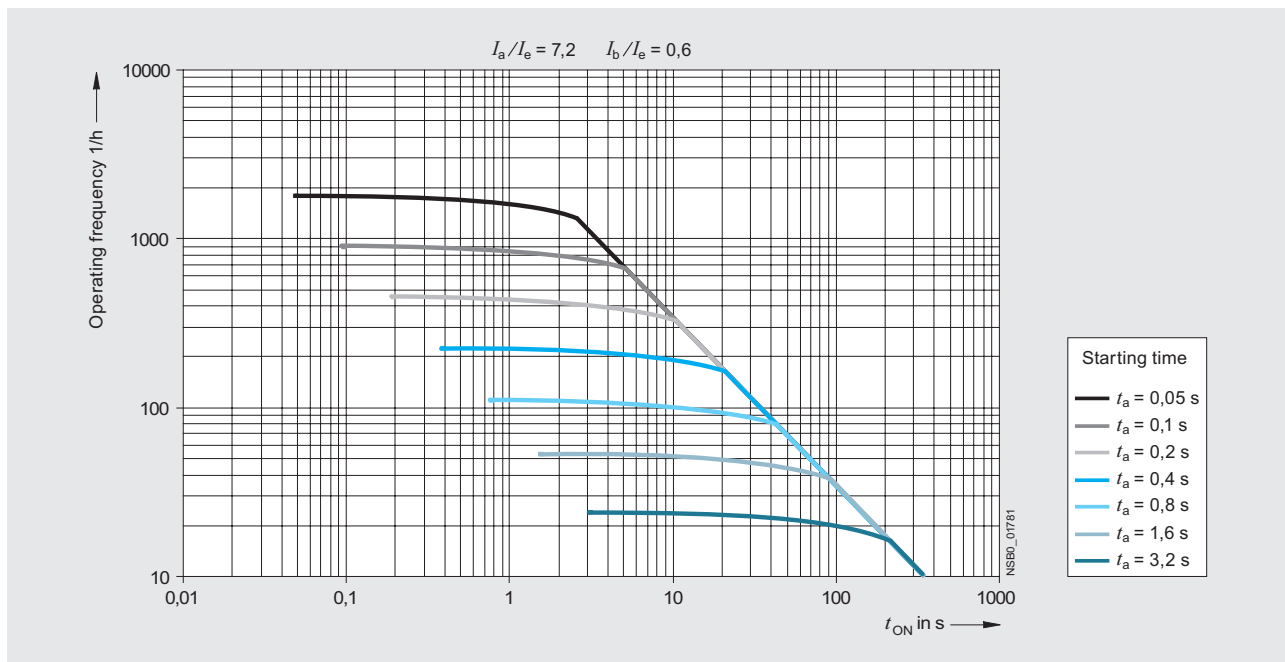
- I_{max} Thermal limit current for individual mounting
- - - I_{max} Thermal limit current for side-by-side mounting
- I_{IEC} Current acc. to IEC 947-4-3 for individual mounting
- - - I_{IEC} Current acc. to IEC 947-4-3 for side-by-side mounting

1) Identical current/temperature curves for stand-alone and side-by-side installation.

Maximum permissible switching frequency depending on the starting time t_a and the ON period t_{ED}



For motors with a starting current of 4- to 7.2 times the rated current and with a full load

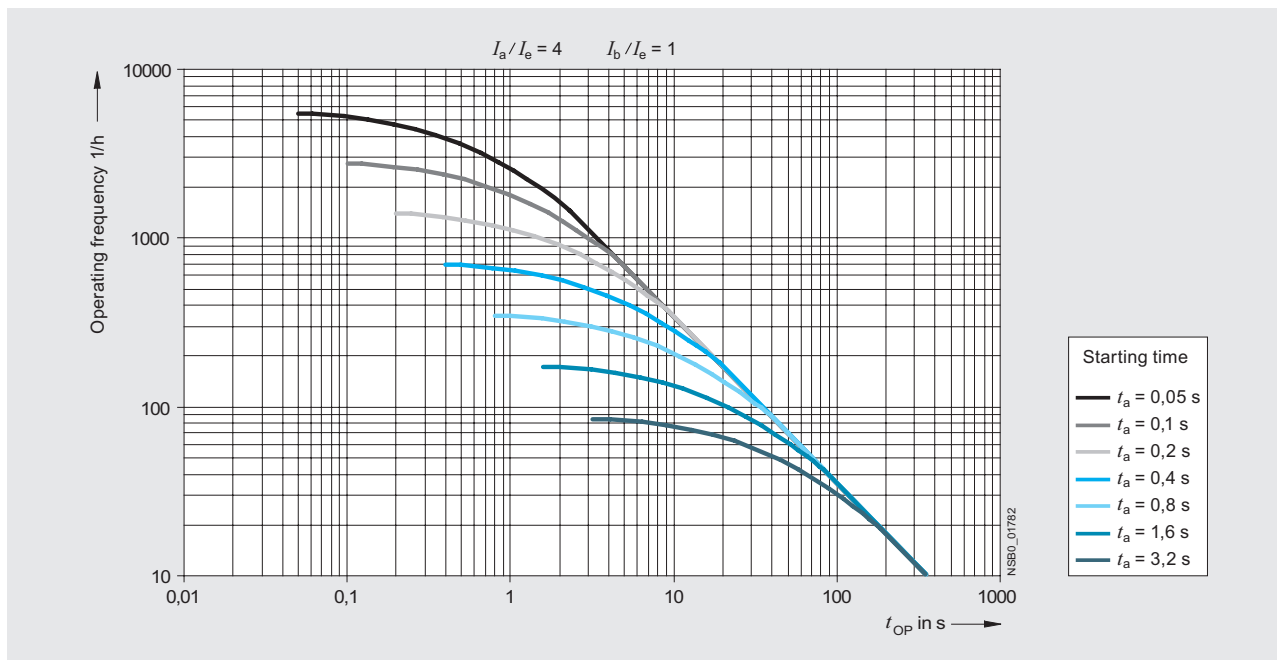


For motors with a starting current of 4- to 7.2 times the rated current and with a 60 % load

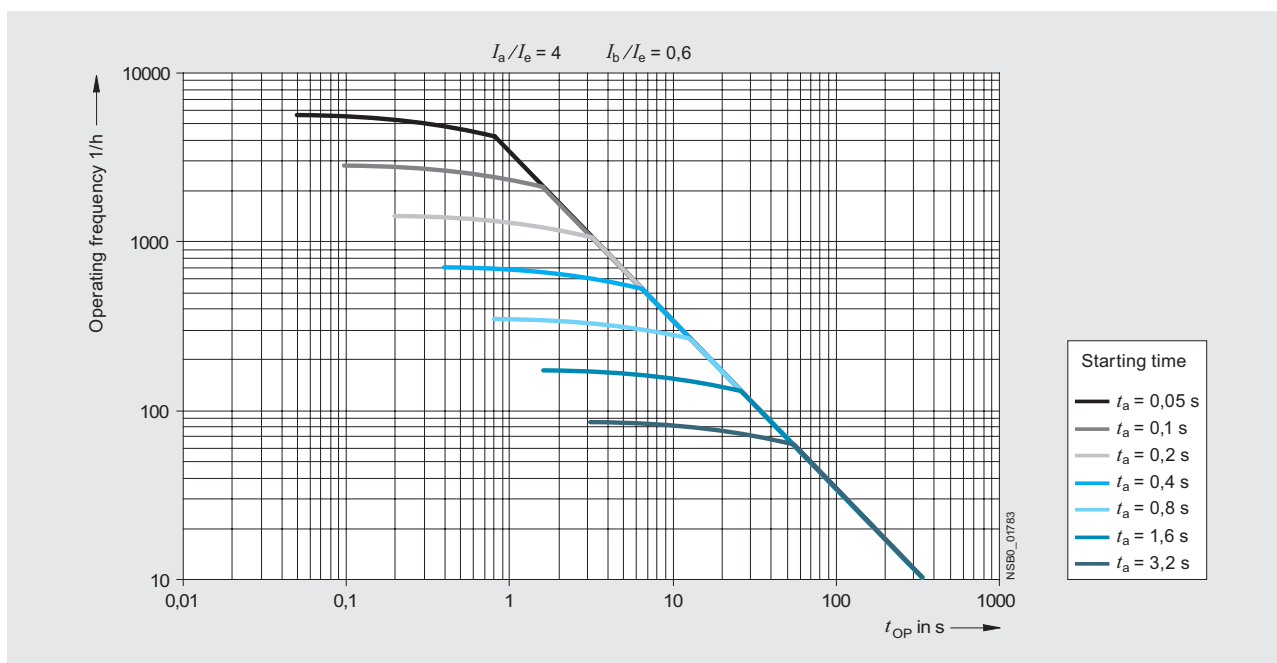
Solid-State Switching Devices

Solid-State Contactors

3RF34 solid-state contactors, 3-phase

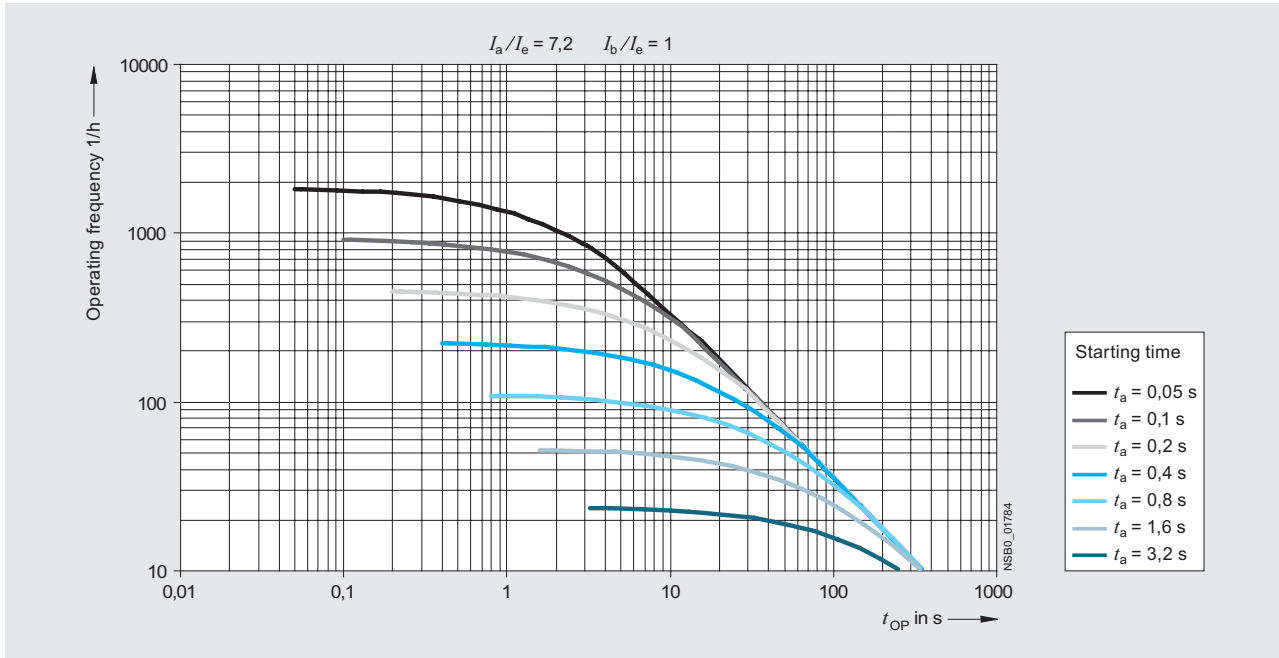


For motors with a starting current of up to 4 times the rated current and with a full load

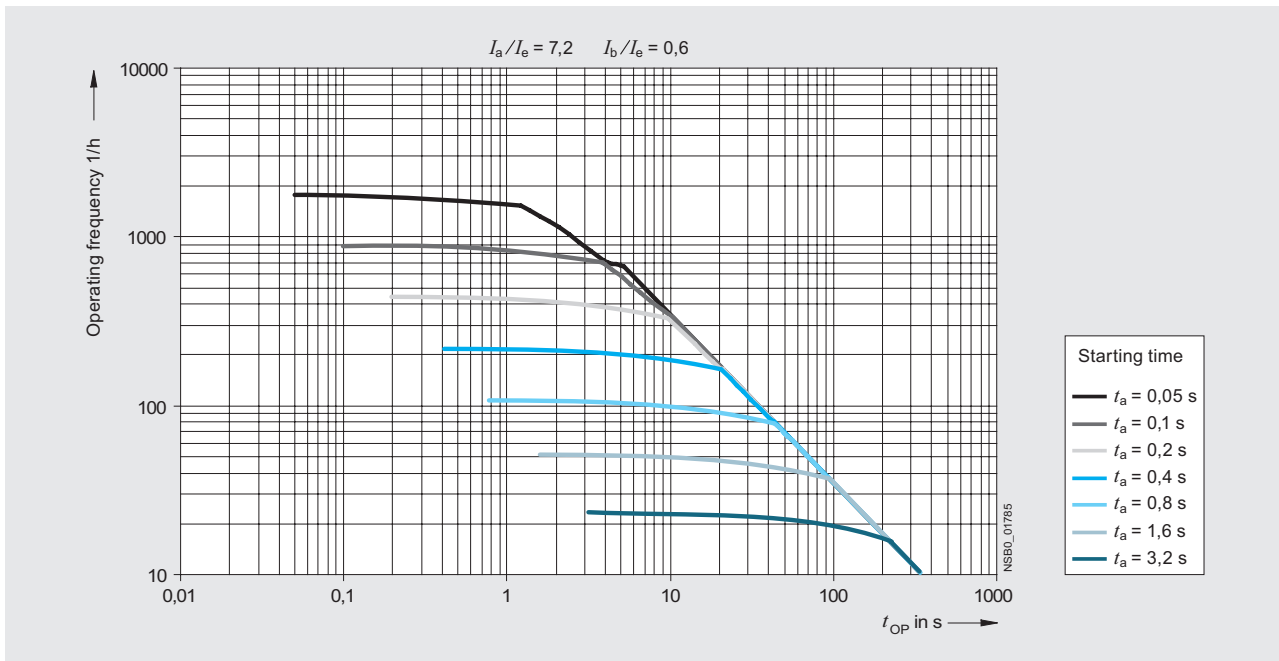


For motors with a starting current of up to 4 times the rated current and with a 60 % load

Maximum permissible switching frequency depending on the starting time t_a and the ON period t_{ED}



For motors with a starting current of 4- to 7.2 times the rated current and with a full load

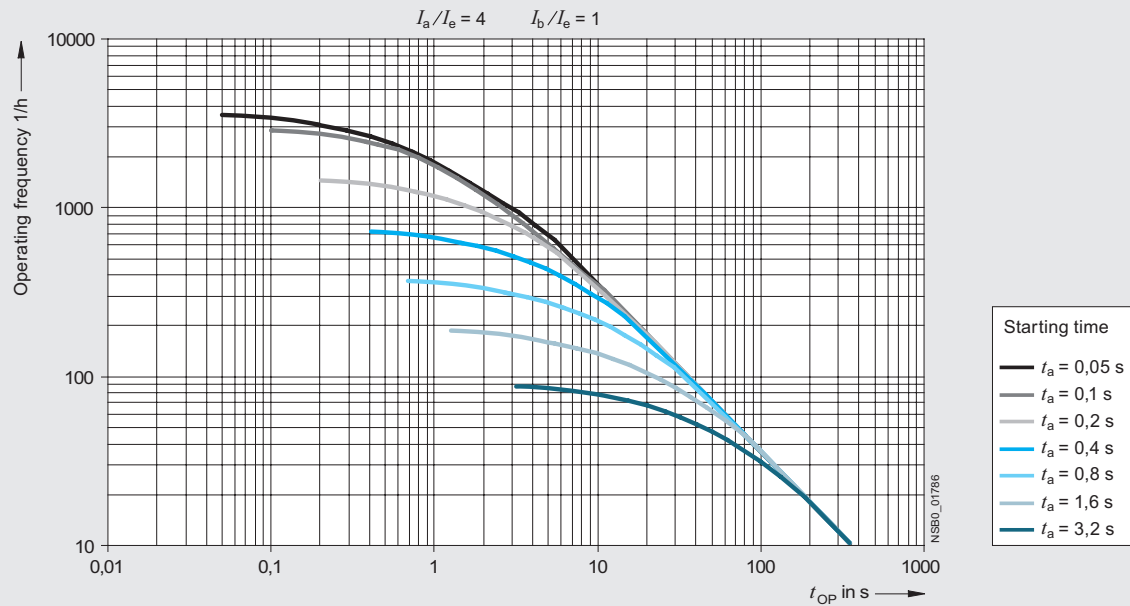


For motors with a starting current of 4- to 7.2 times the rated current and with a 60 % load

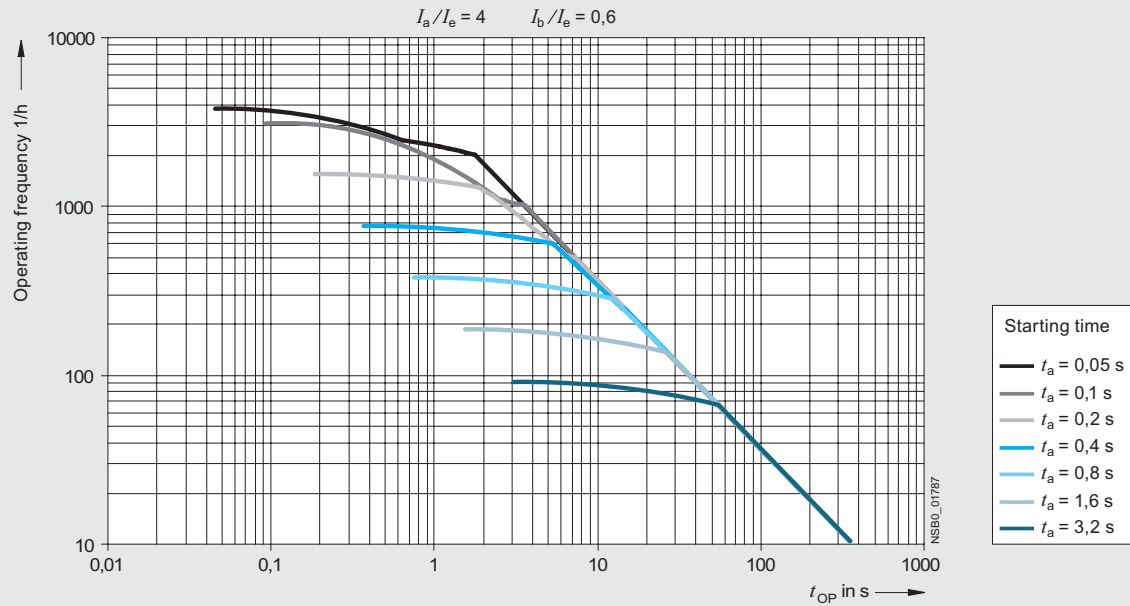
Solid-State Switching Devices

Solid-State Contactors

3RF34 solid-state reversing contactors,
3-phase



For motors with a starting current of up to 4 times the rated current and with a full load

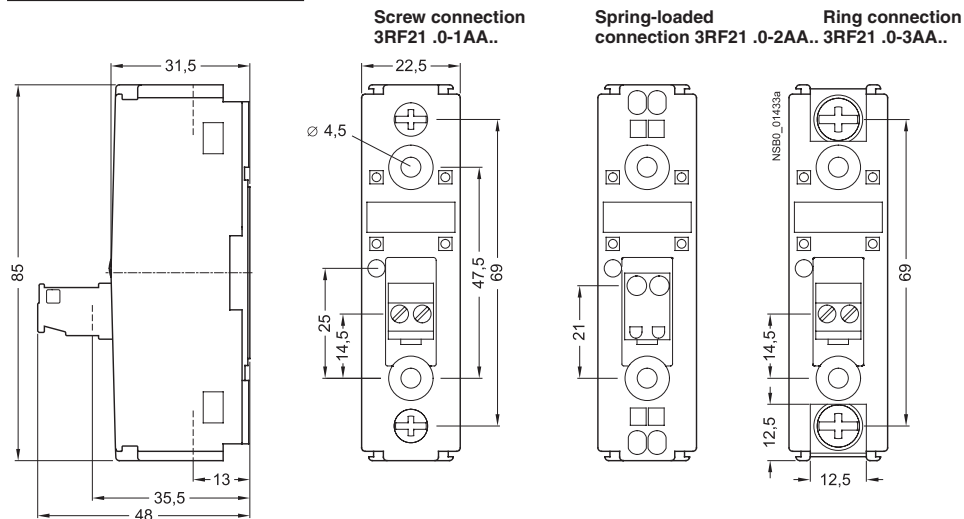


For motors with a starting current of up to 4 times the rated current and with a 60 % load

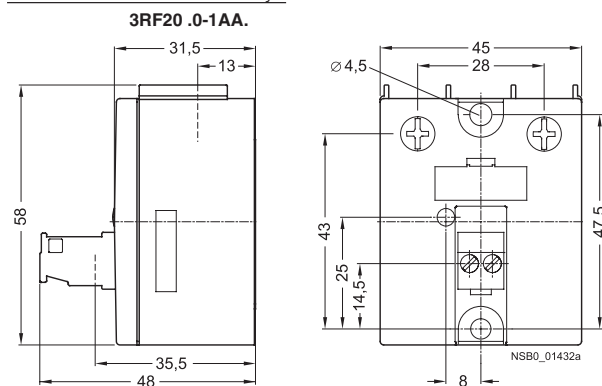
Dimension drawings

SIRIUS SC semiconductor relays

22.5 mm semiconductor relays



45 mm semiconductor relays



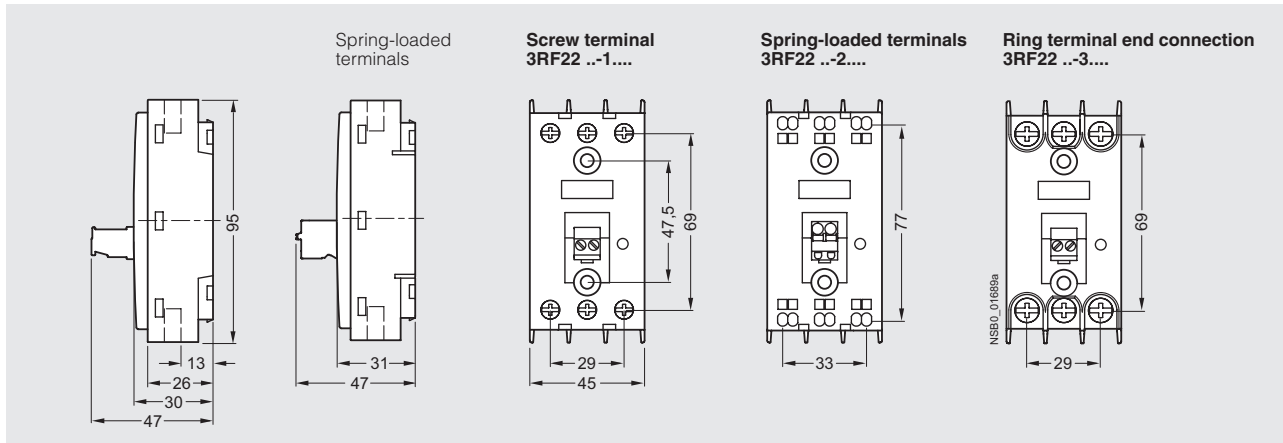
Solid-State Switching Devices

Solid-State Relays

3RF22 solid-state relays, 3-phase, 45 mm

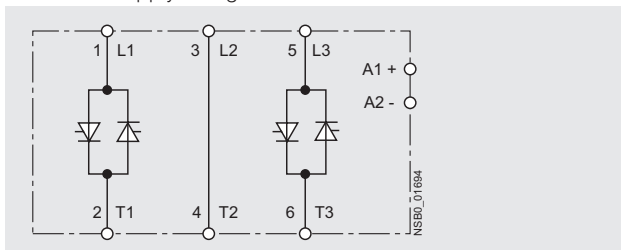
Dimensional drawings

Solid-state relays

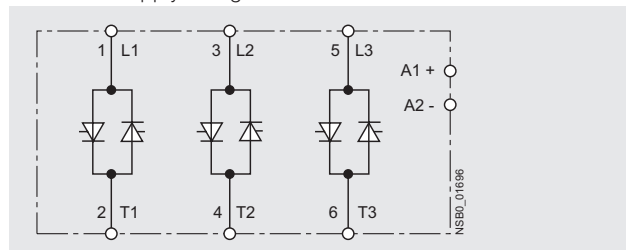


Schematics

Two-phase controlled
DC control supply voltage



Three-phase controlled
DC control supply voltage



Solid-State Switching Devices

Semiconductor Relays and Contactors, Function Modules

Dimensions

1

2

3

4

5

6

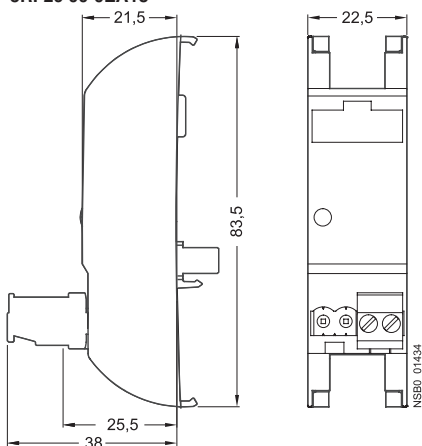
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Function modules for SIRIUS SC semiconductor switching devices

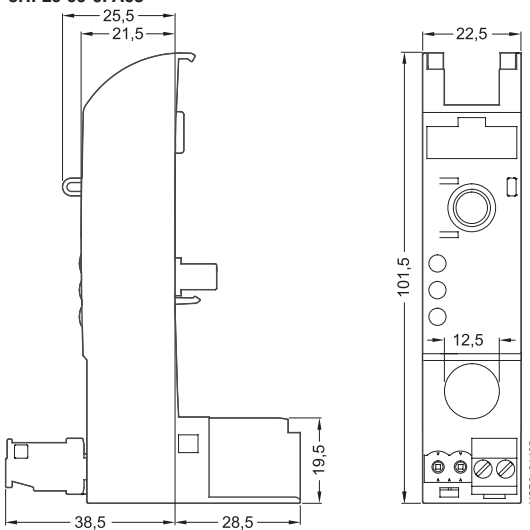
Converters

3RF29 00-0EA18



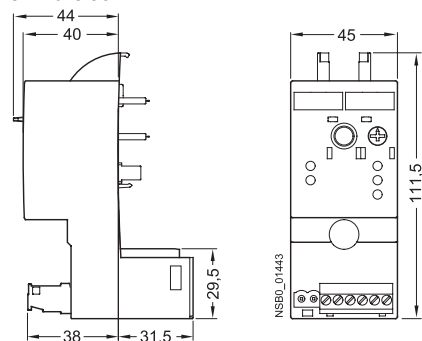
Basic load monitoring

3RF29 00-0FA08



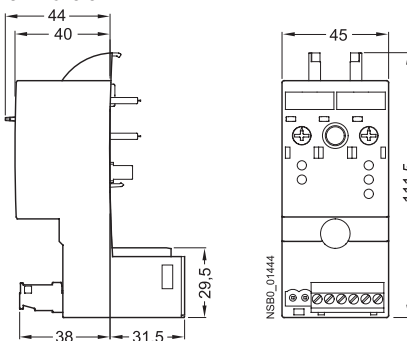
Extended load monitoring

3RF29 .0-0GA..



Power controllers

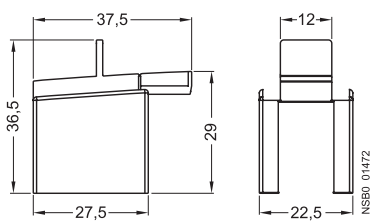
3RF29 .0-0HA..



Accessories for SIRIUS SC semiconductor switching devices

Terminal cover for SIRIUS semiconductor switching devices

3RF29 00-3PA88



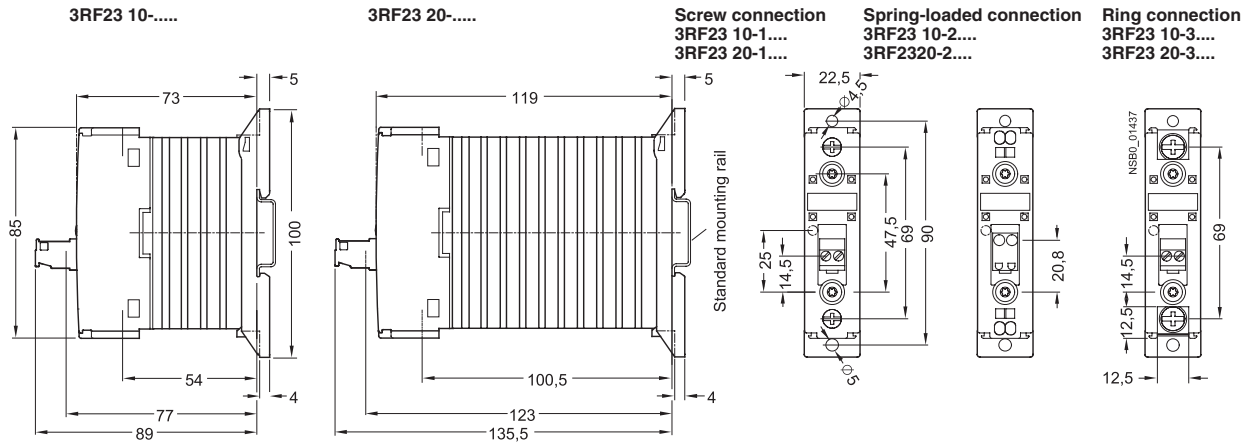
Solid-State Switching Devices

Semiconductor Relays and Contactors, Function Modules

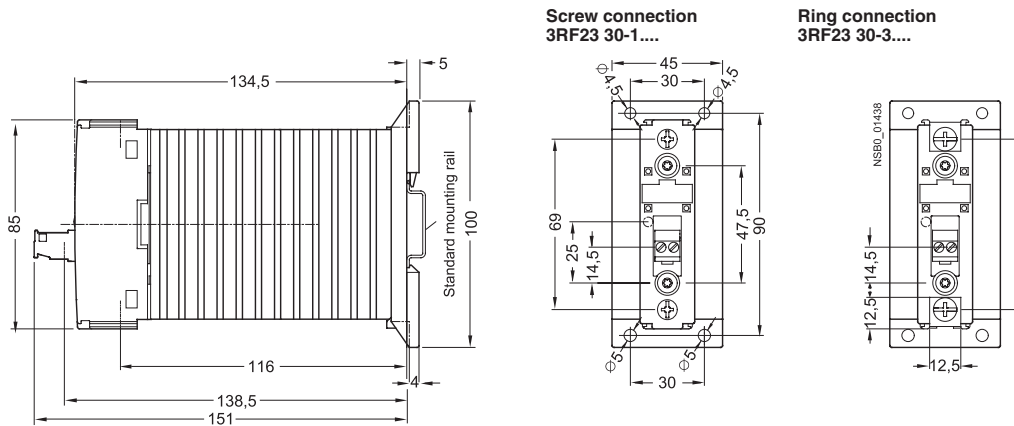
Dimensions

SIRIUS SC semiconductor contactors

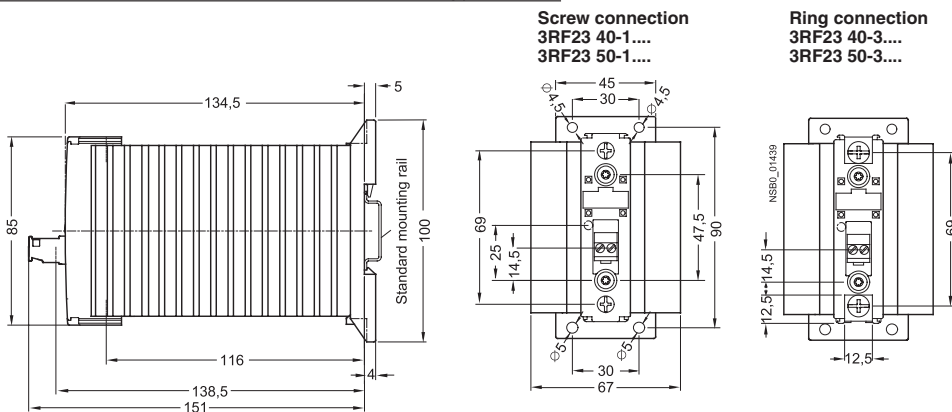
Semiconductor contactors with 10 A and 20 A type current



Semiconductor contactors with 30 A type current



Semiconductor contactors with 40 A and 50 A type current

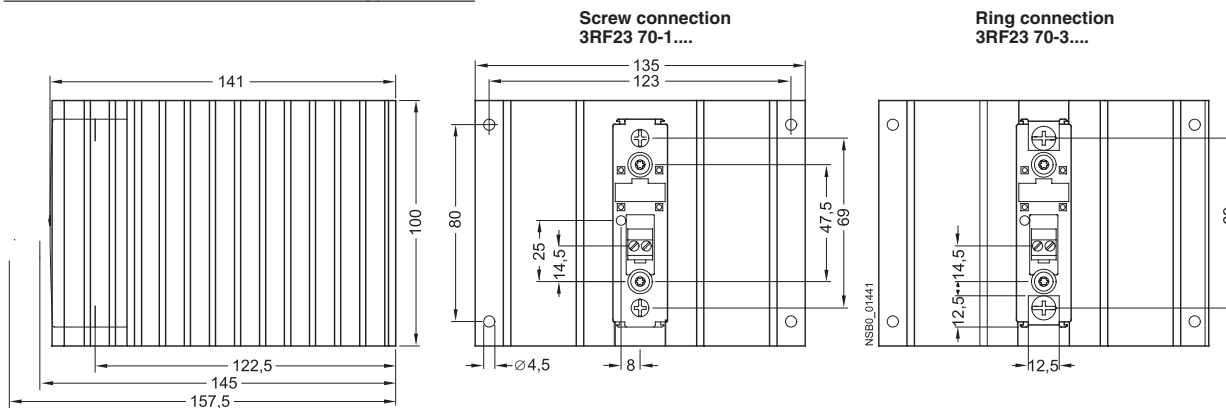


Solid-State Switching Devices

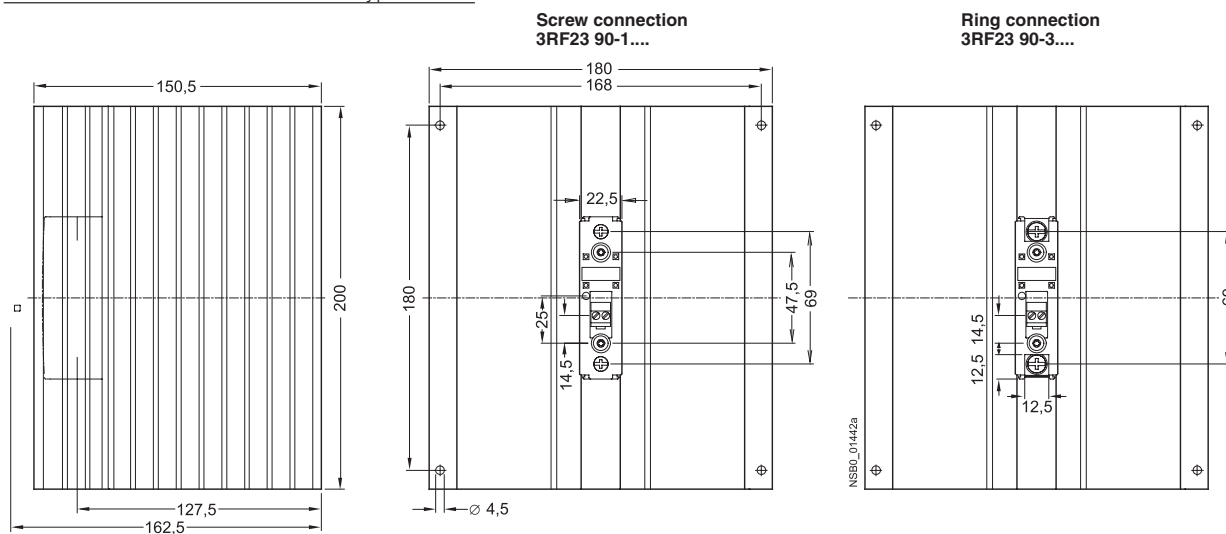
Semiconductor Relays and Contactors, Function Modules

Dimensions

Semiconductor contactors with 70 A type current



Semiconductor contactors with 88 A type current



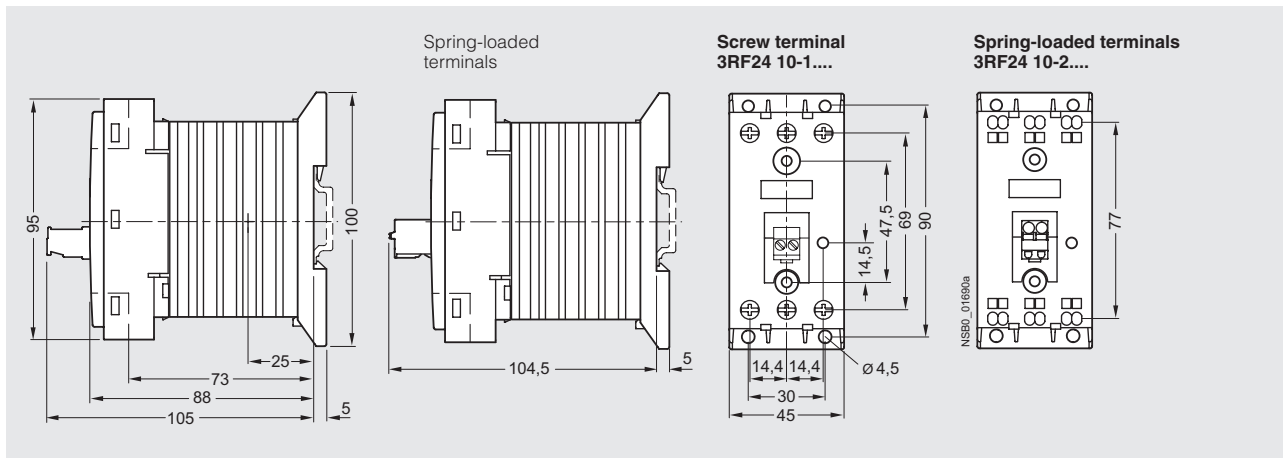
Solid-State Switching Devices

Solid-State Contactors

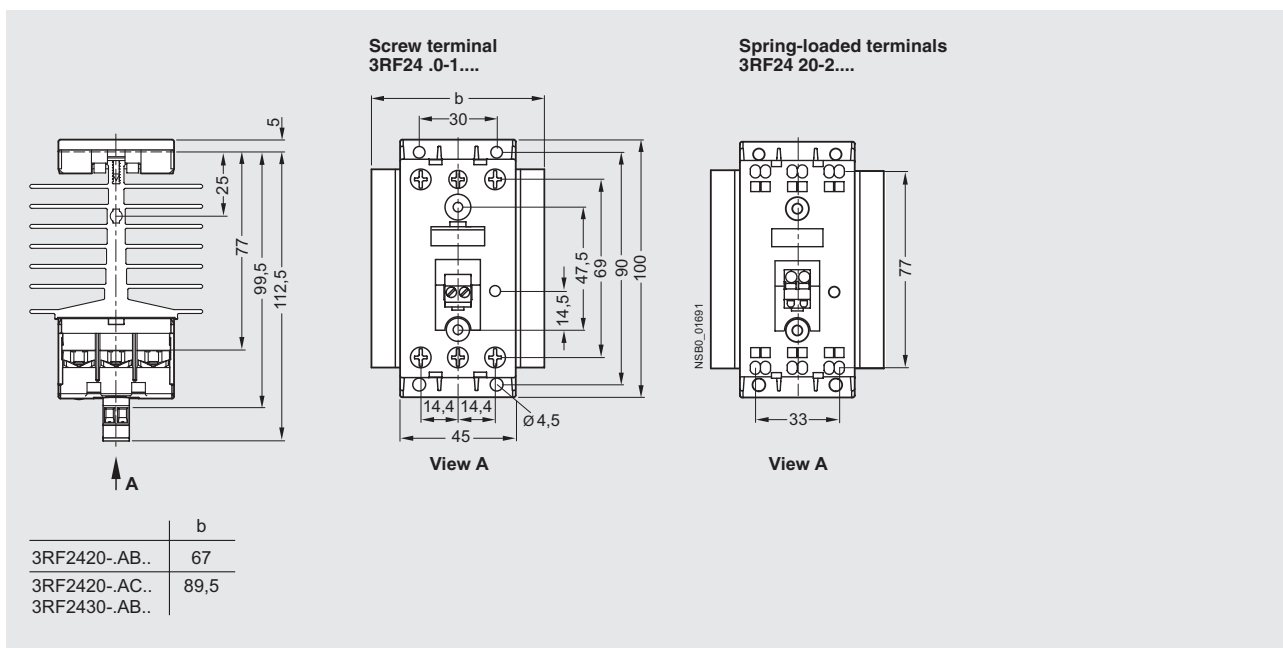
Dimensions

Dimensional drawings

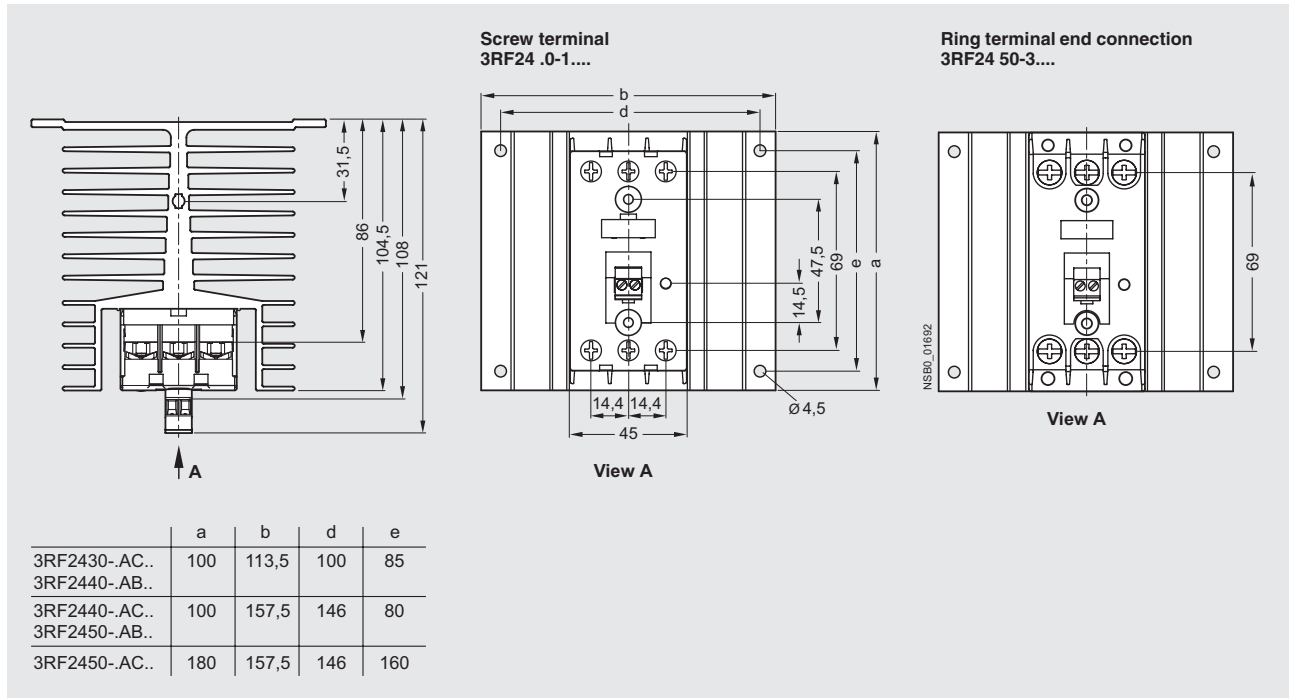
Type current 10.5 A



Type current 20 A; 30 A (2-phase controlled)

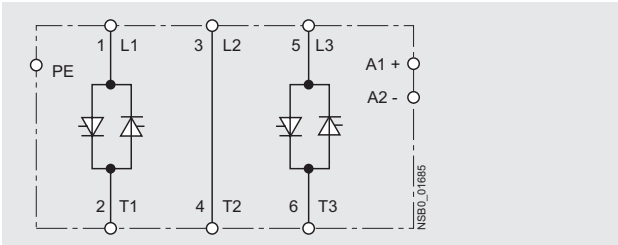


Type current 30 A (3-phase controlled); 40 A, 50 A

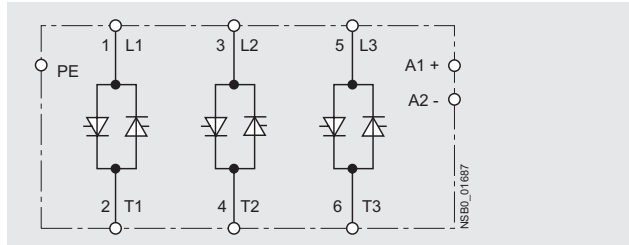


Schematics

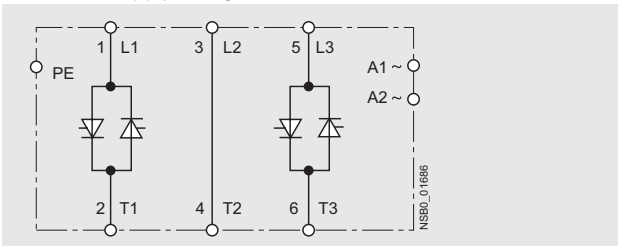
Two-phase controlled
DC control supply voltage



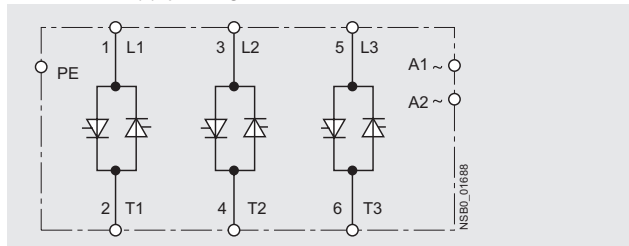
Three-phase controlled
DC control supply voltage



Two-phase controlled
AC control supply voltage



Three-phase controlled
AC control supply voltage



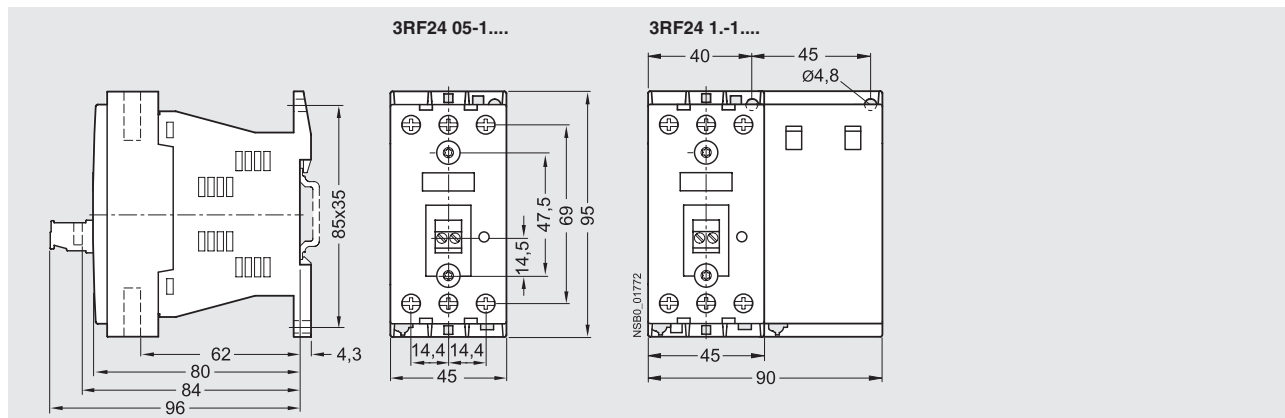
Solid-State Switching Devices

Solid-State Contactors

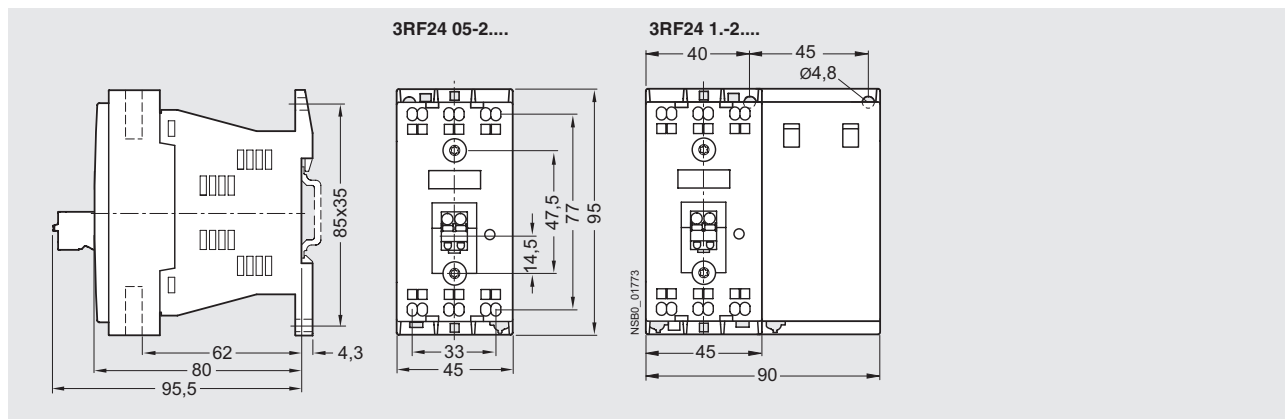
Dimensions

Dimensional drawings

Screw terminals



Spring-loaded terminals



Solid-State Switching Devices

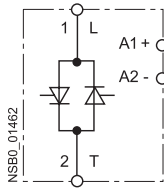
Semiconductor Relays and Contactors, Function Modules

Wiring diagrams

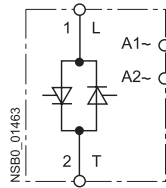
Circuit diagrams

SIRIUS SC semiconductor relays

DC control version

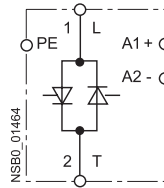


AC control version

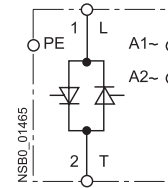


SIRIUS SC semiconductor contactors

DC control version

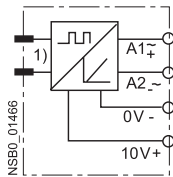


AC control version

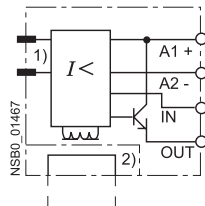


Function modules for SIRIUS SC semiconductor switching devices

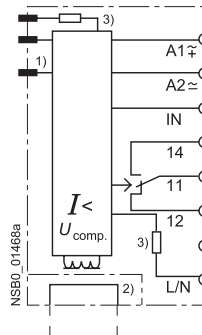
Converters



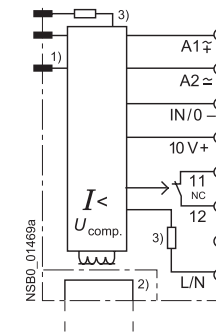
Basic load monitoring



Extended load monitoring



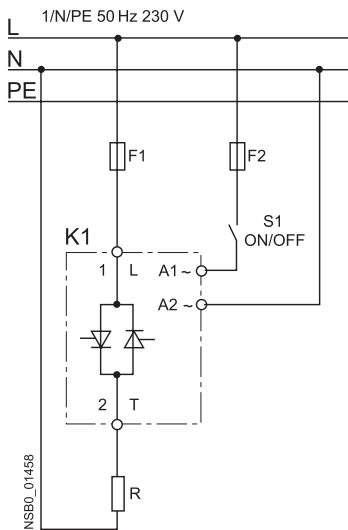
Power controllers



- 1) Internal connection.
- 2) Straight-through transformer.

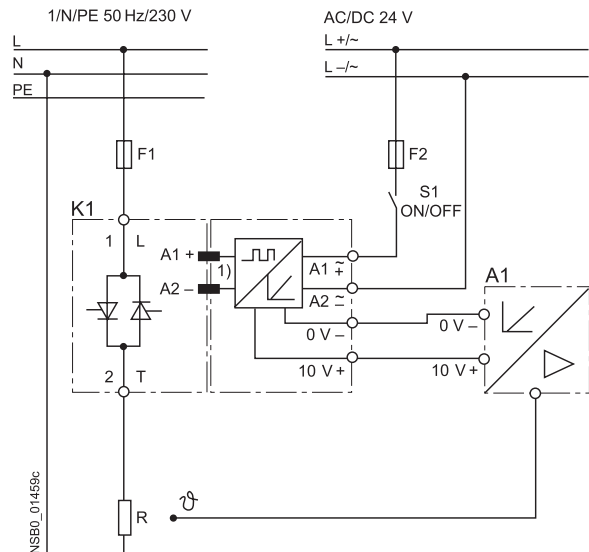
SIRIUS SC semiconductor relays

Typical circuit diagram

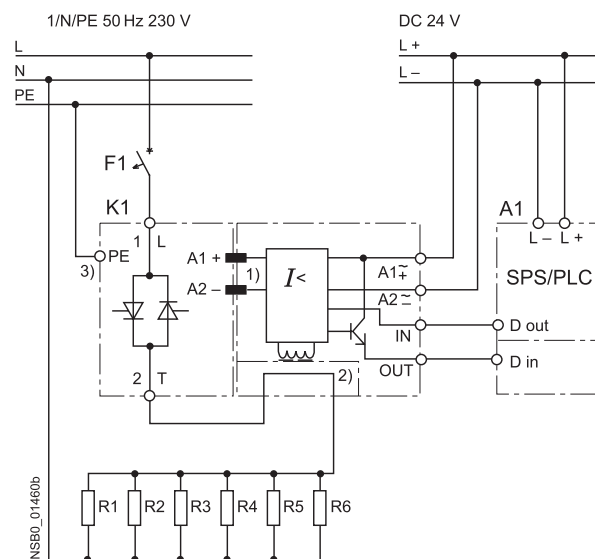


Function modules for SIRIUS SC semiconductor switching devices

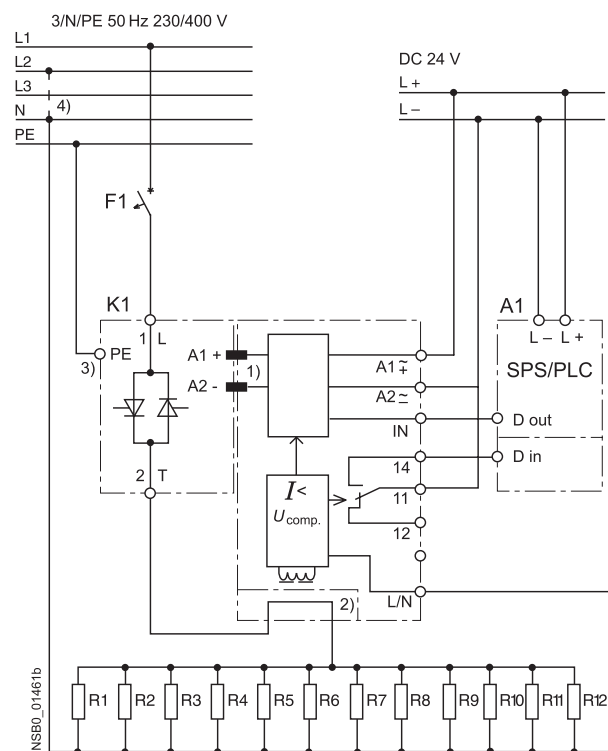
Converters Typical circuit diagram



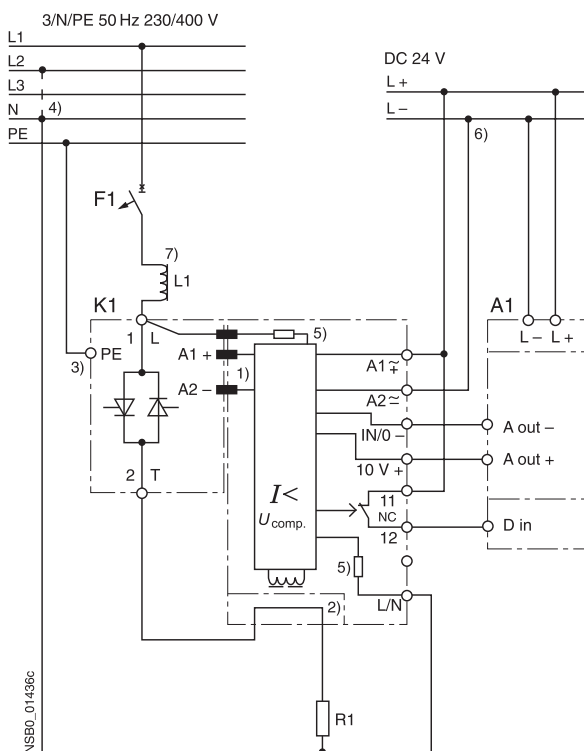
Basic load monitoring Typical circuit diagram



Extended load monitoring Typical circuit diagram



Power controllers Typical circuit diagram



- 1) Internal connection.
- 2) Straight-through transformer.
- 3) PE/ground connection for semiconductor contactors according to installation regulations.
- 4) Connection of contact L/N to N conductor or a second phase according to the rated operational voltage of the function module.
- 5) In order to observe the limit values of the conducted interference voltage for generalized phase control, a choke rated at at least 200 μ H must be included in the load circuit.

- 1) Internal connection to the solid state relay/contactors.
- 2) Straight-through.
- 3) Make PE/ground connection according to installation regulations.
- 4) Connection of L/N contact with
 - 3RF29 ...-0GA.3 load monitoring on neutral conductor N (e.g. 230 V),
 - 3RF29 ...-0GA.6 load monitoring on a second phase (e.g. 400V).
- 5) Voltage detection not electrically isolated (3M Ω per path).
- 6) Grounding of connection L- is recommended.
- 7) A200 μ H choke must be used when operating with leading-edge phase in order to observe the limit values of the conducted interference voltage according to Class A.

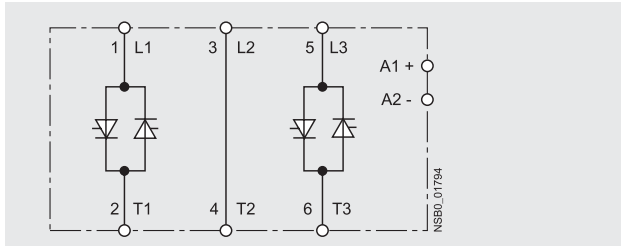
Solid-State Switching Devices for Switching Motors

Solid-State Contactors

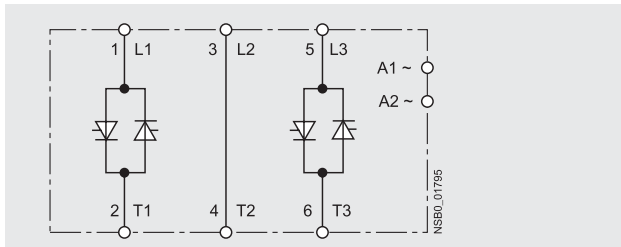
3RF24 solid-state contactors, 3-phase

Schematics

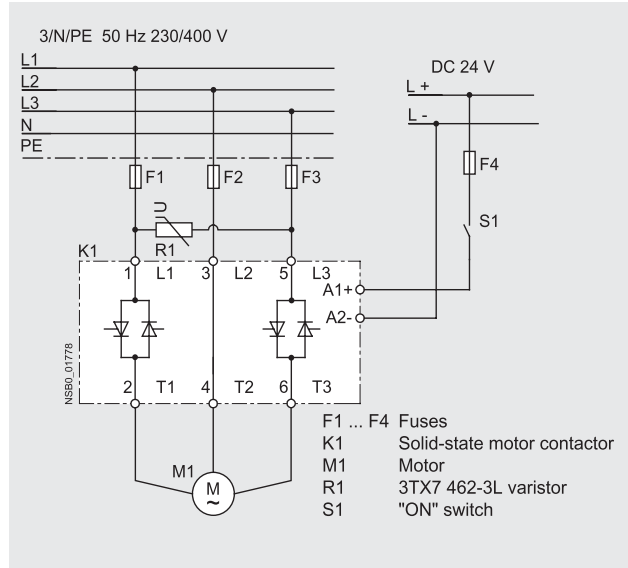
Two-phase controlled,
DC control supply voltage



Two-phase controlled,
AC control supply voltage



Sample schematic



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Control Products

NEMA & General Purpose Controls

Controls Express

Starters at the speed you need

Siemens NEMA starters, pump panels and lighting contactors are known for their dependability and ruggedness, and now they are delivered faster than ever before through Controls Express.

Controls Express puts our most popular products in your hands faster, because we stock more products across our entire product line. Our Class 14 NEMA starters, Class 87 pump panels, and LC & LE lighting contactors are now available in stock for immediate or next day shipping. In addition, thousands of our open and enclosed starters can now be built-to-order and shipped in 1-3 days through Controls Express.

Siemens is committed to making your job easier by stocking more products, offering more configurations, expediting factory modifications, and delivering industry leading turnaround times on our most requested control products.

To quickly identify products that are part of Controls Express and therefore available in 3 days or less, applicable catalog numbers have a light blue background. See the appropriate selection pages listed below.

Class 14 NEMA Starters see pages 9/13 & 9/15

Class 17 NEMA Combination Starters see pages 9/17 to 9/22. For quick ship versions with factory modifications see on-line at www.usa.siemens.com/controls-express

Class 18 NEMA Combination Starters see pages 9/23 & 9/25.

Class 40 NEMA Contactors see page 9/60

Class 87 Pump Panels see pages 9/78 & 9/79

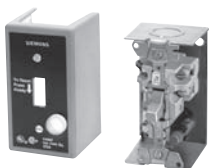
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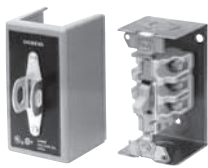


Controls Express lead times apply to orders of up to 6 units of the Class 14, Class 87, LC, or LE. Please contact customer service at 1-866-663-7324 for lead times of larger order volumes.

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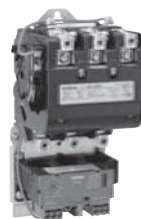
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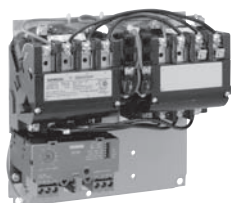
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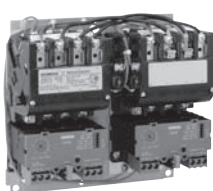
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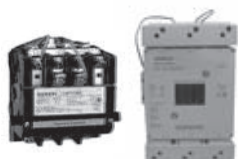
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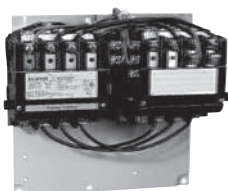
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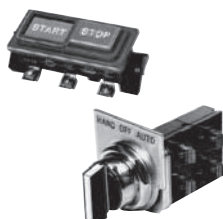
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Manual Control

Fractional HP Starters, Class SMF

General

Class SMF

Class SMF fractional horsepower starters provide overload protection as well as manual on-off control for small horsepower motors in a variety of industrial and commercial applications. Available in one or two pole versions, these devices are suitable for use with AC single phase motors up to 1 HP. Two pole starters can also be used with DC motors up to ¾ HP. Typical applications include fans, conveyors, pumps, and small machine tools.

Continuous Current Rating

16 amperes.

Overload Trip Assembly

Motor protection is provided by a Class SMFH heater element which must be installed before the starter will operate.

Two Speed Starters

Two speed manual starters are designed for control of small single phase AC motors having separate windings for high and low speed operation. Two toggle operated starters are used, with overload protection included for each motor winding. Surface mounting devices, and those with a gray flush plate, utilize a mechanical interlock which allows direct control of the motor by means of the toggle operators.

Enclosures

Class SMF, NEMA Type 1 surface mounting enclosures are sheet steel with a thermo-plastic wrap-around cover for convenience in wiring. The NEMA Type 1 enclosure is also available in an oversized version which allows more wiring space. A zinc alloy die casting is used for NEMA Type 4 enclosures.

Pilot Lights

Red or green neon pilot light units are available for flush mounting plates, NEMA Type 1 enclosures, and NEMA Type 4 enclosures. Pilot lights may be either factory or field installed. (For starters that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.)

Terminals

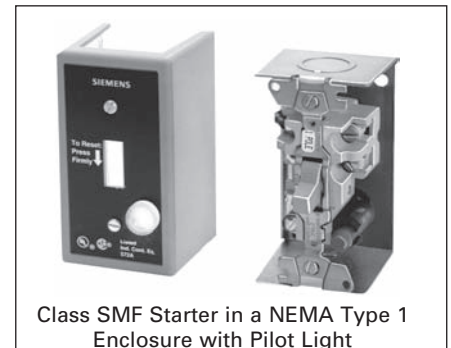
Binding head screw type terminals are suitable for #10 or smaller copper wire, and are accessible from the front. All terminals are clearly marked.

Mounting

Open types without a pilot light fit standard single gang switch boxes, and can be used with any cover plate having a standard toggle cutout. Single-unit flush mounting types, including those with pilot lights, are suitable for wall mounting in a standard switch box or for machine cavity mounting without a box.

Operation

Available with toggle handle or with removable key type operator to discourage unauthorized operation.

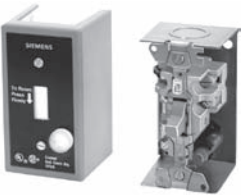


Emergency Off Actuator

A toggle operator extender is available for Class SMF, NEMA Type 1 surface mounted units. The extender has a red vinyl button that provides a fast and easy method for locating and switching the device's toggle operator into the OFF position. The Emergency Off Actuator is available in kit form only for field installation.

Handle Guard/Lock-Off

An optional handle guard on Class SMF, NEMA Type 1 enclosed starters prevents accidental operation of the toggle operator and also allows the toggle operator to be padlocked in either the "ON" or "OFF" position. This handle guard can be factory installed on NEMA Type 1 enclosed starters and is also available in kit form for field installation on NEMA Type 1 surface and flush mounting enclosures. Standard NEMA Type 4 metallic enclosures include provisions for padlocking the device in the OFF position.

 <p>Class SMF Starter in a NEMA Type 1 Enclosure with Pilot Light</p>	Ordering Information						Horsepower Ratings			
	<ul style="list-style-type: none"> ▶ Heater Elements see page 9/124. ▶ Field Modification Kits see page 9/102. ▶ Dimensions see page 9/137. ▶ Wiring Diagrams see page 9/172. 						Volts	Maximum Horsepower		
								AC Single Phase		DC
								1-Pole	2-Pole	2-Pole
							115–230	1	1	¾
							277	1	1	—

Starter—Class SMF, Single Phase^①

Type of Operator	No. of Poles	Starter Features⑤			General Purpose Flush Mounting Open Starter with Flush Plate (No Enclosure Provided)						NEMA Type 1 General Purpose Enclosure, Surface Mounting				NEMA Type 3R, 4 & 12 Watertight, Dust-tight Metallic Enclosure with Clear Cover		NEMA Type 4 Watertight, Dust-tight Metallic Enclosure		NEMA Type 3R, 7 & 9 Div 1 and Div 2 Class I Groups B, C, D & Class II Groups E, F, G Enclosures	
			Open Type		Gray Flush Plate		Standard Stainless Steel Flush Plate		Jumbo Stainless Steel Flush Plate											
			Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$
Toggle	1	Standard	SMFF01		SMFFF1		SMFFS1		—	—	SMFFG1		SMFFGJ1		SMFFWN1		—	—		
		Red Pilot Light	SMFF01P		SMFFF1P		SMFFS1P		SMFFSJ1P		SMFFG1P		SMFFGJ1P		—	—	—			
	2	Standard	SMFF02		SMFFF2		SMFFS2		—	—	SMFFG2		SMFFGJ2		SMFFWN2		—	—		
		Red Pilot Light	SMFF02P		SMFFF2P		SMFFS2P		SMFFSJ2P		SMFFG2P		SMFFGJ2P		—	—	—			
Key	1	Standard	SMFF03		SMFFF3		SMFFS3		—	—	SMFFG3		SMFFGJ3		SMFFWN3		—	—		
		Red Pilot Light	SMFF03P		SMFFF3P		SMFFS3P		SMFFSJ3P		SMFFG3P		SMFFGJ3P		—	—	—			
	2	Standard	SMFF04		SMFFF4		SMFFS4		—	—	SMFFG4		SMFFGJ4		SMFFWN4		—	—		
		Red Pilot Light	SMFF04P		SMFFF4P		SMFFS4P		SMFFSJ4P		SMFFG4P		SMFFGJ4P		—	—	—			

Starter With Handle Guard/Lock-Off—Class SMF, Single Phase^①

Toggle	1	Standard	—	—	④	—	④	—	④	—	SMFFG5	—	SMFFGJ5	—	—	—	SMFFW1 ^②	—	SMFFR1 ^②	—
		Red Pilot Light	—	—	④	—	④	—	④	—	SMFFG5P	—	SMFFGJ5P	—	—	—	SMFFW1P ^②	—	—	—
		(2) ¾" NPT Outlets	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW1H	—	SMFFR1H	—
		(2) ¾" NPT Outlets and Red Pilot Light	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW1PH	—	—	—
	2	Standard	—	—	④	—	④	—	④	—	SMFFG6	—	SMFFGJ6	—	—	—	SMFFW2 ^②	—	SMFFR2 ^②	—
		Red Pilot Light	—	—	④	—	④	—	④	—	SMFFG6P	—	SMFFGJ6P	—	—	—	SMFFW2P ^②	—	—	—
		(2) ¾" NPT Outlets	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW2H	—	SMFFR2H	—
		(2) ¾" NPT Outlets and Red Pilot Light	—	—	④	—	④	—	④	—	—	—	—	—	—	—	SMFFW2PH	—	—	—

One Starter in Duplex Enclosure—Class SMF, Single Phase^①

Type of Operator	Number of Poles	Starter Features ^⑤	General Purpose Flush Mounting Open Starter with Flush Plate - (No Enclosure Provided)				NEMA Type 1 General Purpose Enclosure Surface Mounting				Replacement Starters	
			Gray Flush Plate For Wall or Cavity Mounting		Stainless Steel Flush Plate for Wall or Cavity Mounting		NEMA Type 1 General Purpose Enclosure Surface Mounting		Replacement Starters			
			Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Toggle	2	Standard	—	—	—	—	—	—	SMFFG02	—	—	—
		Red Pilot Light	—	—	—	—	—	—	SMFFG02P	—	—	—
Key	2	Red Pilot Light	—	—	—	—	—	—	SMFFG04P	—	—	—

Two Starters in Duplex Enclosure—Class SMF, Single Phase^③

Toggle	2 Per Starter	Standard	SMFFF222	—	—	—	SMFFG222	—	—	—	—
		Red Pilot Light on Each Starter	SMFFF222P	—	—	—	SMFFG222P	—	—	—	—
Key	2 Per Starter	Red Pilot Light on Each Starter	SMFFF44P	—	—	—	SMFFG44P	—	—	—	—

Starter And "Auto-Off-Hand" SPDT Selector Switch (AC Only)—Class SMF, Single Phase^①

Toggle	1	Standard	SMFFF71	—	—	—	SMFFG71	—	—	—	—
		Red Pilot Light	SMFFF71P	—	—	—	SMFFG71P	—	—	—	—
	2	Standard	SMFFF72	—	—	—	SMFFG72	—	—	—	—
		Red Pilot Light	SMFFF72P	—	—	—	SMFFG72P	—	—	—	—
Key	2	Red Pilot Light	SMFFF74P	—	—	—	SMFFG74P	—	—	—	—

Two Speed Starters (AC Only)—Class SMF, Single Phase^③

Toggle	1	Mechanical Interlock	SMFFF11	—	—	—	SMFFG11	—	—	SMFF01T	—
		Mechanical Interlock and (2) Red Pilot Lights	SMFFF11P	—	—	—	SMFFG11P	—	—	SMFF01PT	—
		Mechanical Interlock, HIGH-OFF-LOW Selector Switch and (2) Red Pilot Lights	—	—	SMFFS101P	—	—	—	—	SMFF01PT	—
	2	Mechanical Interlock	SMFFF22	—	—	—	SMFFG22	—	—	SMFF02T	—
		Mechanical Interlock and (2) Red Pilot Lights	SMFFF22P	—	—	—	SMFFG22P	—	—	SMFF02PT	—
		Mechanical Interlock, HIGH-OFF-LOW Selector Switch and (2) Red Pilot Lights	—	—	SMFFS202P	—	—	—	—	SMFF02PT	—

^① One heater element required.

^② Furnished with (1) ¾" NPT Outlet in bottom (reversible for top feed).

^③ Two heater elements required.

^④ Order Open Type starter plus separate handle guard kit.

^⑤ For starters that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.

Manual Control

Fractional HP Switches, Class MMS, MRS

General

Class MMS, MRS

Class MMS and MRS motor starting switches provide manual "ON-OFF" control of single or three phase AC motors where overload protection is not required or is provided separately. Compact construction and a 600 volt rating make these switches suitable for a wide range of industrial and commercial uses. Typical applications include small machine tools, pumps, fans, conveyors and many other types of electrical machinery. They can also be used on non-motor loads such as resistance heating applications.

Continuous Current Rating

MMS & MRS: 30 amperes at 250 volts max, 26.4 amperes at 277 volts, 20 amperes at 600 volts max, 30 amperes resistive at 600 volts max.

Two Speed—Class MRS

Two speed manual switches may be used with separate winding three phase or single phase AC motors where overload protection is not required or is provided separately. Two switches are employed to give "ON-OFF" control in each speed.

Reversing—Class MRS

Reversing manual switches provide a compact means of starting, stopping and reversing AC motors where overload protection is not required or is provided separately. They are suitable for use with three phase squirrel cage motors and for single phase motors which can be reversed by reconnecting motor leads. Two switches are used, one to connect the motor forward rotation and one for reverse.

Enclosures

Class MMS, MRS, NEMA Type 1 surface mounting enclosures are sheet steel with a thermo-plastic wrap-around cover for convenience in wiring. The NEMA Type 1 enclosure is also available in an oversized version which allows more wiring space. A zinc alloy die casting is used for NEMA Type 4 enclosures.

Pilot Lights

Red or green neon pilot light units are available for flush mounting plates, NEMA Type 1 enclosures, and NEMA Type 4 enclosures. Pilot lights may be either factory or field installed. (For switches that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.)

Terminals

Binding head screw type terminals are suitable for #10 or smaller copper wire, and are accessible from the front. All terminals are clearly marked.

Mounting

Open types without a pilot light fit standard single gang switch boxes, and can be used with any cover plate having a standard toggle cutout. Single-unit flush mounting types, including those with pilot lights, are suitable for wall mounting in a standard switch box or for machine cavity mounting without a box.

Operation

Available with toggle handle or with removable key type operator to discourage unauthorized operation.




Class MMS Switch in a NEMA Type 1 Enclosure

Emergency Off Actuator

A toggle operator extender is available for Class MMS, MRS, NEMA Type 1 surface mounted units. The extender has a red vinyl button that provides a fast and easy method for locating and switching the device's toggle operator into the OFF position. The Emergency Off Actuator is available in kit form only for field installation.

Handle Guard/Lock-Off

An optional handle guard on Class MMS, MRS, NEMA Type 1 enclosed switches prevents accidental operation of the toggle operator and also allows the toggle operator to be padlocked in either the "ON" or "OFF" position. This handle guard is available in kit form for field installation on NEMA Type 1 surface and flush mounting enclosures. Standard NEMA Type 4 metallic enclosures include provisions for padlocking the device in the OFF position.

 Class MMS Switch in a NEMA Type 1 Enclosure	Ordering Information		Horsepower Ratings								
	<ul style="list-style-type: none">▶ Heater Elements not Required.▶ Field Modification Kits see page 9/102.▶ Dimensions see page 9/137.▶ Wiring Diagrams see page 9/172.		Device	No of Poles	Motor Type AC	Maximum HP			DC Ratings		
						115V	230V	450–575V	90V	115V	230V
			Class MMS	2	Single Phase	2	2	3	1	2	1½
				3	3-Phase	2	7½	10	1	2	1½
			Class MRS Reversing	2	Single Phase	2	2	3	1	2	1½
				3	3-Phase	2	7½	10	1	2	1½
			Class MMS Two Speed	2	Single Phase	2	2	3	1	2	1½
				3	3-Phase, Constant or Variable Torque	2	7½	10	1	2	1½
				3	3-Phase, Constant Horsepower	2	7½	10	1	2	1½

Switch—Class MMS, Single Phase and 3-Phase

Type of Operator	No of Poles	Switch Features ^④	Open Type		General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided)						NEMA Type 1 General Purpose Enclosure Surface Mounting				NEMA Type 3R, 4 & 12 Watertight, Dust-tight Metallic Enclosures with Clear Cover		NEMA Type 4 [®] Watertight, Dust-tight Metallic Enclosure		NEMA Type 7 & 9 [®] Class I Groups B, C & D & Class II Groups E, F, G Enclosures	
			Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$
Toggle	2	Standard	MMSK01		MMSKF1		MMSKS1		—	—	MMSKG1		MMSKGJ1		MMSKWN1		MMSKW1		MMSKR1	
		Red Pilot Light 115V AC	MMSK01A ^③		MMSKF1A		MMSKS1A		MMSKSJ1A		MMSKG1A		MMSKGJ1A				MMSKW1A		—	—
		Red Pilot Light 230V AC	MMSK01B ^③		MMSKF1B		MMSKS1B		MMSKSJ1B		MMSKG1B		MMSKGJ1B				MMSKW1B		—	—
	3	Standard	MMSK02		MMSKF2		MMSKS2		—	—	MMSKG2		MMSKGJ2		MMSKWN2		MMSKW2		MMSKR2	
		Red Pilot Light 208-240V AC	MMSK02B ^③		MMSKF2B		MMSKS2B		MMSKSJ2B		MMSKG2B		MMSKGJ2B				MMSKW2B		—	—
		Red Pilot Light 440-600V AC	MMSK02C ^③		MMSKF2C		MMSKS2C		MMSKSJ2C		MMSKG2C		MMSKGJ2C				MMSKW2C		—	—
Key	2	Standard	MMSK03		MMSKF3		MMSKS3		—	—	MMSKG3		MMSKGJ3		MMSKWN3		—	—	—	—
		Red Pilot Light 115V AC	MMSK03A		MMSKF3A		MMSKS3A		MMSKSJ3A		MMSKG3A		MMSKGJ3A				—	—	—	—
		Red Pilot Light 230V AC	MMSK03B		MMSKF3B		MMSKS3B		MMSKSJ3B		MMSKG3B		MMSKGJ3B				—	—	—	—
	3	Standard	MMSK04		MMSKF4		MMSKS4		—	—	MMSKG4		MMSKGJ4		MMSKWN4		—	—	—	—
		Red Pilot Light 208-240V AC	MMSK04B		MMSKF4B		MMSKS4B		MMSKSJ4B		MMSKG4B		MMSKGJ4B				—	—	—	—
		Red Pilot Light 440-600V AC	MMSK04C	—	MMSKF4C	—	MMSKS4C	—	MMSKSJ4C	—	MMSKG4C	—	MMSKGJ4C	—	—	—	—	—	—	—

Reversing Switch—Class MRS, Single Phase and 3-Phase

Type of Operator	Number of Poles	Suitable Motor Types	Switch Features④ (Including Mechanical Interlock)	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided)		NEMA Type 1 General Purpose Enclosure Surface Mounting		Replacement Switch Class MRS	
				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Toggle	2	Single Phase 3-Lead Repulsion-Induction	Standard	MRSKF11		MRSKG11		MRSK01T	
			Red Pilot Device—115V AC	MRSKF11A		MRSKG11A		MRSK01AT	
			Red Pilot Device—230V AC	MRSKF11B		MRSKG11B		MRSK01BT	
	3	3-Phase; Also Single Phase Capacitor, Split Phase, or 4-Lead Repulsion-Induction	Standard	MRSKF22		MRSKG22		MRSK02T	
			Red Pilot Light—110–120V AC	MRSKF22A		MRSKG22A		MRSK02AT	
			Red Pilot Light—208–220V AC	MRSKF22B		MRSKG22B		MRSK02BT	
			Red Pilot Light—440–600V AC	MRSKF22C		MRSKG22C		MRSK02CT	

Two Speed Switch—Class MMS, Single Phase and 3-Phase

Type of Operator	Number of Poles	Suitable Motor Types	Switch Features ^④ (Including Mechanical Interlock)	General Purpose Flush Mounting Open Switch with Flush Plate (No Enclosure Provided)		NEMA Type 1 General Purpose Enclosure Surface Mounting		Replacement Switch Class MRS	
				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Toggle	2	Single Phase Two Winding (3-Lead)	Standard	MMSKF11		MMSKG11		MRSK01T	
			(2) Red Pilot Devices—115V AC	MMSKF11A		MMSKG11A		MRSK01AT	
			(2) Red Pilot Devices—230V AC	MMSKF11B		MMSKG11B		MRSK01BT	
	3	3-Phase Separate Winding (Wye-Connected)	Standard	MMSKF22		MMSKG22		MRSK02T	
			(2) Red Pilot Lights—208–240V AC	MMSKF22B		MMSKG22B		MRSK02BT	
			(2) Red Pilot Lights—440–600V AC	MMSKF22C		MMSKG22C		MRSK02CT	

① Manual switches do not include overloads.

② Furnished with (1) 3/4" NPT outlet in bottom (reversible for top feed). In order to obtain a 3/4" NPT outlet in top and bottom, add suffix letter "H" to type number with List Price adder.

③ Do not use as replacement interiors for NEMA Type 4 metallic enclosures. For replacement unit, order Type MMSK01 or MMSK02 and separate pilot light kit.

④ For switches that contain a pilot light, a Red light is standard. For a Green pilot light add "G" to the end of the catalog number.

Now Available with the New 3RV2 Innovations MSP

Class 11 - 3RV

Class 11 across the line manual starters and switches provide control for machinery where remote start stop control is not required.

Class 11 - 3RV manual starters are used for single and poly-phase motors up to 20HP @ 575V. Starters have bimetallic heater elements to provide class 10 overcurrent protection. Each starter has a fourth bimetallic strip that reacts only to the ambient temperature inside the control panel. This ambient compensation helps prevent the starter from nuisance tripping when the panel temperature is higher than the ambient temperature of the motor.

A built-in differential trip bar causes the starter to trip faster on a phase loss condition to help reduce motor damage.

Magnetic trip elements in each starter take the device off line when it senses current of 13 times the maximum FLA dial setting.

Class 11 - 3RV switches provide control for inherently protected motors. Typical applications include metal and woodworking machinery, grinders, power saws, conveyors, fans, pumps, blowers, textile and packaging machinery, and paper cutters.

Each switch is provided with magnetic trip elements which take the device off line when it senses current of 13 times the maximum switch rating.

Class 11 - 3RV manual starters can be used as Type E self-protected manual combination starters (up to 22 amps) per UL508 or as components in Group Installation per NEC 430.53. When using the Class 11 - 3RV as a manual combination starter upstream protection is not required.

Class 11 - 3RV controllers are available with low voltage protection which will automatically open the power poles when the voltage drops or the power is interrupted.

Controllers with the LVP option provide the OSHA requirements for protecting personnel from potential injury caused by the automatic start-up of machinery following a voltage drop or power interruption when low voltage protection is specified.

Class 11 - 3RV is available as Open style, or in NEMA 1, NEMA 7 & 9 or NEMA 7 & 9 / 3 & 4 enclosures.

Standard Features include:

- ON/OFF rotary handle with lockout and visible trip indication
- Adjustment dial for setting to motor FLA (Starters only)
- Low Voltage Protection (LVP) Option
- Short Circuit trip at 13 times the maximum setting of the FLA dial or rated current
- Ambient compensated up to 140°F
- Phase loss sensitivity
- Test trip function
- LVP Option Meets OSHA Requirements
- UL Listed
- CSA Certified



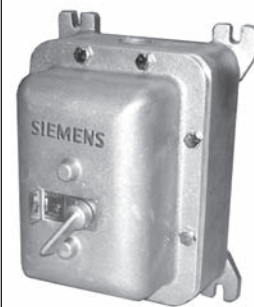
OPEN TYPE
Starter



NEMA 1
General Purpose



NEMA 7 & 9
Div 1 & Div 2
Class I Group C & D
Class II Group E, F & G



NEMA 3 & 4, NEMA 7 & 9
Div 1 & Div 2
Class I Group C & D
Class II Group E, F & G



Class 11 Manual Motor Starter

Ordering Information

- ▶ No heaters required.
- ▶ Field Modification Kits see page 9/102.
- ▶ Dimensions see page 9/139.
- ▶ Wiring Diagrams see page 9/172.
- ▶ For applications requiring a low voltage protection coil see table at right.

Low Voltage Protection Coil Table

60 Hz Voltage	Letter
120V	*F
208V	*D
240V	*G
460V	*H

*Add corresponding letter to end of base Class 11 catalog number for low voltage protection coil with List Price adder.

Note: The LVP option for Open type 3RV is available from the factory, please order separately from the field modification kits on page 9/103.

The coil voltage should correspond with the line voltage.

Manual Starter—Class 11 - 3RV

FLA Adjustment Range ^①	Max HP						Enclosure							
	Single Phase HP Ratings		3-Phase HP Ratings				Open Type		NEMA 1 General Purpose		NEMA 7 & 9 Class I Groups C & D Class II Groups E, F & G		NEMA 3 & 4, NEMA 7 & 9 Watertight Class I Groups C & D Class II Groups E, F & G	
	115V	230V	200V	230V	460V	575V	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$
0.11-0.16	—	—	—	—	—	—	3RV2011-0AA10 ^②		11AD3B		11AD3H		11AD3W	
0.14-0.2	—	—	—	—	—	—	3RV2011-0BA10 ^②		11BD3B		11BD3H		11BD3W	
0.18-0.25	—	—	—	—	—	—	3RV2011-0CA10 ^②		11CD3B		11CD3H		11CD3W	
0.22-0.32	—	—	—	—	—	—	3RV2011-0DA10 ^②		11DD3B		11DD3H		11DD3W	
0.28-0.4	—	—	—	—	—	—	3RV2011-0EA10 ^②		11ED3B		11ED3H		11ED3W	
0.35-0.5	—	—	—	—	—	—	3RV2011-0FA10 ^②		11FD3B		11FD3H		11FD3W	
0.45-0.63	—	—	—	—	—	—	3RV2021-0GA10 ^②		11GD3B		11GD3H		11GD3W	
0.55-0.8	—	—	—	—	—	½	3RV2021-0HA10 ^②		11HD3B		11HD3H		11HD3W	
0.7-1	—	—	—	—	½	½	3RV2021-0JA10 ^②		11JD3B		11JD3H		11JD3W	
0.9-1.25	—	—	—	—	¾	¾	3RV2021-0KA10 ^②		11KD3B		11KD3H		11KD3W	
1.1-1.6	—	⅓	—	—	¾	1	3RV2021-1AA10 ^②		11LD3B		11LD3H		11LD3W	
1.4-2	—	⅓	—	—	1	1 ½	3RV2021-1BA10 ^②		11MD3B		11MD3H		11MD3W	
1.8-2.5	—	⅓	½	½	1 ½	1 ½	3RV2021-1CA10 ^②		11ND3B		11ND3H		11ND3W	
2.2-3.2	⅓	⅓	¾	¾	1 ½	2	3RV2021-1DA10 ^②		11PD3B		11PD3H		11PD3W	
2.8-4	⅓	⅓	¾	1	2	3	3RV2021-1EA10 ^②		11QD3B		11QD3H		11QD3W	
3.5-5	⅓	⅓	1	1	3	3	3RV2021-1FA10 ^②		11RD3B		11RD3H		11RD3W	
4.5-6.3	⅓	¾	1 ½	1 ½	5	5	3RV2021-1GA10 ^②		11SD3B		11SD3H		11SD3W	
5.5-8	⅓	1	2	2	5	5	3RV2021-1HA10 ^②		11TD3B		11TD3H		11TD3W	
7-10	⅓	1 ½	3	3	7 ½	10	3RV2021-1JA10 ^②		11UD3B		11UD3H		11UD3W	
9-12.5	⅓	2	3	3	7 ½	10	3RV2021-1KA10 ^②		11VD3B		11VD3H		11VD3W	
11-16	1	3	5	5	10	15 ^③	3RV2021-4AA10 ^②		11WD3B		11WD3H		11WD3W	
14-20	1 ½	3	5	7 ½	15	20 ^③	3RV2021-4BA10 ^②		11XD3B		11XD3H		11XD3W	
17-22	2	3	7 ½	7 ½	15	20 ^③	3RV2021-4CA10 ^②		11YD3B		11YD3H		11YD3W	
20-25	2 ^③	5 ^③	7 ½ ^③	7 ½ ^③	15 ^③	20 ^③	3RV2021-4DA10 ^②		11ZD3B		11ZD3H		11ZD3W	

Manual Switch—Class 11 - 3RV

Rated Current ^①	Max HP						Enclosure							
	Single Phase HP Ratings		3-Phase HP Ratings				Open Type		NEMA 1 General Purpose		NEMA 7 & 9 Class I Groups C & D Class II Groups E, F & G		NEMA 3 & 4, NEMA 7 & 9 Watertight Class I Groups C & D Class II Groups E, F & G	
	115V	230V	200V	230V	460V	575V	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$	Catalog No.	List Price \$
1	—	—	—	—	½ ^③	½ ^③	3RV2321-0JC10 ^②		111D3B		111D3H		111D3W	
5	½ ^③	½ ^③	1 ^③	1 ^③	3 ^③	3 ^③	3RV2321-1FC10 ^②		112D3B		112D3H		112D3W	
10	½ ^③	1 ½ ^③	3 ^③	3 ^③	7 ½ ^③	10 ^③	3RV2321-1JC10 ^②		113D3B		113D3H		113D3W	
20	1 ½ ^③	3 ^③	5 ^③	7 ½ ^③	15 ^③	20 ^③	3RV2321-4BC10 ^②		114D3B		114D3H		114D3W	
25	2 ^③	5 ^③	7 ½ ^③	7 ½ ^③	15 ^③	20 ^③	3RV2321-4DC10 ^②		115D3B		115D3H		115D3W	

^① Instantaneous Magnetic Trip will occur at 13 times the maximum FLA dial setting or rated switch current.

^② Product Category: IEC

^③ Shaded Ratings apply for Manual Motor Controllers Only! These Ratings do not apply as UL Listed Manual Combination Starters.

^④ Add 1 to the end of the catalog number for 1/2 inch drain hole with plug and list price adder. Drain fitting not supplied, order separately XDB-2.

Heavy Duty Control

Catalog Numbering System

General

Class	Size	Model	Enclosure Size	Enclosure Type	Solid-state OLR Current Range ^⑤	Three Phase	Breaker HP Code ^② Horsepower Rating 200, 230, 460, 575
17 — Combination Starter (Non Fusible, Fusible)	B — 00	U — Solid-state OLR size 0-4 & size 7 & 8	92 — Standard Width	B — NEMA 1	A — 0.25-1	A — 0.25-1	A — 1/2, 1, 1
18 — Combination Starter (Circuit Breaker)	C — 0	P — Thermal size 0-3 1/2	82 — Extra Wide	F — NEMA 4X Fiberglass	B — 0.75-3.4	B — 0.75-3.4	B — 1, 1, 3, 3
25 — Reversing Combination Starter (Non Fusible, Fusible)	D — 1			H — NEMA 7/9/3/4, Bolted (Class 18 & 26 only)	C — 3-12	C — 3-12	C — 3, 3, 5, 5
26 — Reversing Combination Starter (Circuit Breaker)	E — 1 3/4			N — NEMA 12 (Field convertible to 3/3R/4)	D — 5.5-22	D — 5.5-22	D — 3, 3, 7 1/2, 7 1/2
	F — 2			W — NEMA 4/4X 304 Stainless Steel	E — 10-40	E — 10-40	E — 7 1/2, 7 1/2, 10, 10
	G — 2 1/2				F — 13-52	F — 13-52	F — —, —, 15, 15
	H — 3				G — 25-100	G — 25-100	G — 10, 10, —, —
	I — 3 1/2				H — 50-200	H — 50-200	H — 7 1/2, 10, 20, 20
	J — 4				J — 100-300 w/ CT's	J — 100-300 w/ CT's	J ^⑥ — 10, 15, 25, 25
	L — 5				K — 133-400 w/ CT's	K — 133-400 w/ CT's	K — —, —, 30, 30
	M — 6				L — 200-600 w/ CT's	L — 200-600 w/ CT's	L — 15, 20, —, —
	N — 7				M — 250-750 w/ CT's	M — 250-750 w/ CT's	M — —, —, 30, 30
	P — 8				N — 400-1200 w/ CT's	N — 400-1200 w/ CT's	N — 25, 30, 50, 50
							P — 30, 40, 75, 75
							R — 40, 50, 100, 100

Class	Size	Model	Enclosure Size	Enclosure Type	Solid-state OLR Current Range ^⑤	Three Phase	Pilot Control Circuit	Coil
14 — Across the Line NEMA Motor Starter	B — 00	U — Solid-state OLR size 00-4, Size 7 & 8	1 — 2 power poles, 1-phase	A — Open	A — 0.25-1	A — 0.25-1	2 — suitable for 3-wire control (NO aux. contact incl.)	A ^③ — 110-120V/220-240V@60Hz
22 — Reversing NEMA Motor Starter	C — 0	P — Thermal size 00-4, Solid state sizes 5 & 6	3 — 3 power poles, 3-phase	B — NEMA 1	B — 0.75-3.4	B — 0.75-3.4		110V/190-220V@50Hz
40 — Across the Line NEMA Magnetic Contactor	D — 1		8 — 3 power poles, 3-phase, extra wide enclosure	F — NEMA 4X Fiberglass	C — 3-12	C — 3-12		C ^③ — 220-240V/440-480V@60Hz
43 — Reversing NEMA Magnetic Contactor	E — 1 3/4			H — NEMA 7/9/3/4, Bolted (Class 18 & 26 only)	D — 5.5-22	D — 5.5-22		190-220V/380-440V@50Hz
	F — 2			0 — NEMA 12 (Field convertible to 3/3R/4)	E — 10-40	E — 10-40		D — 200-208V@60Hz
	G — 2 1/2			W — NEMA 4/4X 304 Stainless Steel	F — 13-52	F — 13-52		E — 550-600V@60Hz
	H — 3				G — 25-100	G — 25-100		550V@50Hz
	I — 3 1/2				H — 50-200	H — 50-200		F — 120V@60Hz
	J — 4				J — 100-300 w/ CT's	J — 100-300 w/ CT's		110V@50Hz
	L — 5				K — 133-400 w/ CT's	K — 133-400 w/ CT's		G — 220-240V@60Hz
	M — 6				L — 200-600 w/ CT's	L — 200-600 w/ CT's		220-240V/440-480V@60Hz
	N — 7				M — 250-750 w/ CT's	M — 250-750 w/ CT's		H — 440-480V@60Hz
	P — 8				N — 400-1200 w/ CT's	N — 400-1200 w/ CT's		380-440V@50Hz
								J ^⑥ — 24V@60Hz
								24V@50Hz
								L — 277V@60Hz
								240V@50Hz

			Solid-state OLR Current Range ^⑤					
Class	Size	Model	Type	Line Volts	Enclosure Type	Coil	Disconnect Type ^④	
36 — Non Combination Reduced Voltage Starter	C — 0	U — Solid-state OLR size 0–4 & size 7 & 8 P — Thermal, size 0–3 1/2 Solid state size 5 & 6	T — Auto XFMR	2 — 230	A — Open	D	D — Non Fused Disc.	
	D — 1		P — Part Wind.	3 — 380	B — NEMA 1	E	F — Fusible Disc.	
	E — 1 3/4		0 — Wye Delta	4 — 460	W — NEMA 4/4X	F	P — MCP	
	F — 2		Open Trans.	5 — 575	Stainless Steel	G		
	G — 2 1/2		C — Wye Delta Closed Trans.	6 — 200/208	0 — NEMA 12	H	L	
37 — Combination Reduced Voltage Starter	H — 3							
	I — 3 1/2							
	J — 4							
	L — 5							
	M — 6							
	N — 7							
	P — 8							

① Single phase solid-state OLR available on Class 14 Starters only.

② Not used on Class 17, 25 or with solid-state OLR versions.

③ Not available on sizes 5-8.

④ For Class 37 only.

⑤ Position used for solid-state OLR only.

⑥ Not available on sizes 7 and 8.



Solid State Starter Class 14

Standard Features

Size 00–4 magnetic starters include the following standard features:

- Rugged Industrial Design
- Half Sizes for Cost and Space Savings
- Dual Voltage, Dual Frequency Coils
- Solid State or Ambient Compensated Bimetal Overload Protection
- Wide Range of Accessories
- Easy Coil Access
- Overload Test Feature
- Straight Thru Wiring
- Gravity Dropout
- Large Silver Cadmium Contacts
- UL listed file #E14900 (class 14, 22, 30, 40 & 43)
- CSA certified file #LR 6535 (class 14, 22, 30, 40 & 43)

Application

Heavy Duty starters are designed for across the line starting of single phase and polyphase motors.

These controls are available in NEMA Sizes 00 through 8. In addition to the usual NEMA Starter Sizes, Siemens offers three exclusive Half Sizes; 1¾, 2½ and 3½. These integral sizes offer the same rugged, industrial construction as our NEMA Sizes and ensure efficient operating performance. Half Sizes provide a real cost savings by cutting down on over capacity when NEMA Sizes exceed the motor ratings. All Siemens Heavy Duty controls, including our popular Half Sizes comply with applicable NEMA and UL tests.

All starters are supplied with a NO holding interlock that in conjunction with an appropriate pilot device will provide low voltage protection or release.

NEMA starters are ideal for applications requiring dependability and durability. Typical applications include use with machine tools, air conditioning equipment, material handling equipment, compressors, hoists and various production and industrial equipment as well as in demanding automotive applications.

Starters are available as an open type or in NEMA 1, 12/3/3R, 4 (painted), 4/4X (stainless), 4X (fiberglass), and 7 & 9 enclosures.

Gravity Dropout

For added reliability, the gravity dropout of the armature and contacts is assisted by stainless steel springs which help provide quick, precise opening of the contacts.

45 Degree, Wedge Action Contacts

The 45 degree, wedge action contacts reduce tracking and provide faster arc quenching. The resulting self-cleaning and reduced contact bounce mean cooler operation and longer life for the large silver cadmium oxide contacts.

Terminal Design

Control terminals are self-rising pressure type.

Molded Coil

Magnetic coils are carefully wound and then sealed in epoxy. Encapsulation helps seal out moisture, promotes heat transfer and resists electrical, mechanical and thermal stresses.

Dual Voltage/Frequency Coil

Starters are available with dual voltage, dual frequency coils. They are designed to operate on either 50 or 60 Hertz.

Molded Stationary Contact Block

Thermoset materials resist arc tracking and the stresses of heat and severe impact.

Field Modification Kits

All starters can be modified in the field with a complete range of accessories. These include pushbuttons, selector switches, pilot lights, auxiliary contacts and surge suppressors.

Auxiliary Equipment

- NEMA starters are available with built-in START-STOP push buttons for 3-wire control or a HAND-OFF-AUTO selector switch for 2-wire control
- Field modifications such as auxiliary contacts, pilot lights, push buttons, selector switches, and fuse blocks are available to meet particular application requirements
- Normally opened or normally closed auxiliary power pole kits are available for Sizes 00 through 1¾
- Transformers can be ordered as either factory or field modifications. In some cases these may require a larger enclosure
- A full line of replacement parts are available including contact kits, coils, and overload relays

Size 5 & 6 Starters Additional Features

- Solid State Overload (3RB type) Standard
- Latest technology in arc quenching to extend contactor life
- Wide variety of enclosures in all starter configurations

Size 7 & 8 Starters Additional Features

- New Compact Design
- Can be mounted in any position
- Same coil voltage is AC or DC

Heavy Duty Starters

Features and Benefits

Selection



ESP200™ Solid State Starter

ESP200™ starters combine the rugged NEMA contactors with a state of the art solid state overload that provides phase loss, phase unbalance ground fault protection. It offers the user greater motor protection and extended life in heavy duty applications. The ESP200™ ultimately results in a cost savings to the user.

ESP200™ Solid State Overload Relays

Standard features provide Improved Starter Performance:

- True phase loss protection; trips within 3 seconds
- Phase unbalanced prevents motor running inefficiently
- Ground fault trip when selected
- Selectable trip class 5, 10, 20 or 30
- Reset trip can be selected Auto/ Manual restart
- Easy to select and use, Dip Switch selectable
- Overload is self powered, no need for external power source

Half Size Starters

Half-Size starters feature all the rugged performance characteristics of our NEMA rated starter sizes, but are fractionally sized to more closely match your exact motor rating. As a result, significant economic savings are made possible without sacrificing the reliability you expect from a heavy duty starter.

These additional starter sizes have the reserve capacity to handle occasional plugging and jogging applications without derating. Superior operating performance in heavy duty applications is assured by the large current carrying parts, not by derating the device.

Exclusive “half-sizes” save potentially hundreds, even thousands of dollars per project.

Using the table below, simply match the specific size starter to the horsepower rating of your motor. Every half-size starter saves you money—up to 31%.

All “half-sizes” comply to applicable NEMA and UL standards.

ESP200® FLA Adjustment Dial—Set the adjustment dial on the overload to the FLA of the motor.

Figure 1



Typical Solid-State Overload Adjustment Dial Markings

Each overload is precisely calibrated and labels are laser printed.



DIP Switch Settings

Adjust DIP switch settings to the Trip Class desired 5, 10, 20, or 30.

- Set Phase Unbalance ON or OFF
- Set Phase Loss ON or OFF
- Set Reset to Manual or Automatic
- Set Ground Fault ON or OFF

Savings for Siemens “Half-Size” Starters in NEMA 1 Enclosures, FVNR

Motor Size		Starter Size	Half Size	List Price \$	“Half-Size” Savings Over Next Full Size
230V	460V				
7½	10	1	—		—
10	15	—	1¾		31%
15	25	2	—		—
20	30	—	2½		20%
30	50	3	—		—
40	75	—	3½		13%
50	100	4	—		—

Standard Auxiliary Contacts			
Type	Size (3rd Character)	Configuration	Internal / External
All FVNR Starters & Contactors	B Thru E	1N.O.	Internal
	F Thru J	1N.O.	External
	L Thru M	2N.O., 2N.C.	External
	N Thru P	1N.O., 1N.C.	External

Selection



- ### Coil Table

For other voltages and frequencies,
see **Factory Modifications** page 9/119.

Open Type & Standard Width Enclosure, Single Phase, 2-Pole^③

⑤ F coil 100-250V AC 50/60Hz, or DC,
H coil 150-500V AC 50/60Hz, or DC

⑥ Only available F coil 100-250V AC 50/60Hz, or DC

Selection



- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/157.
- ▶ Wiring Diagrams see page 9/173.
- ▶ Replacement Parts see page 9/131.

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A
200–208	D
220–240	G
277	L
220–240/440–480	C
440–480	H
575–600	E

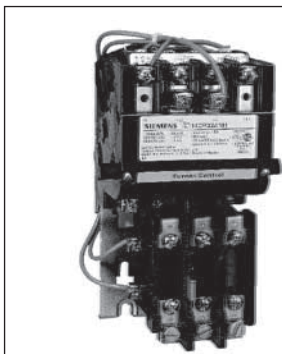
Max Hp				NEMA Size	Half Size	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight, Corrosion Resistant ② = W for 304 Stainless Steel ③ = X for 316 Stainless Steel		NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R ^② Industrial Use Weatherproof (Field Convertible to 3/3R)	
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
⅓	⅓	⅓	⅓	00	—	0.25–1	A	14BUA82B*		Use Size 0	—	Use Size 0	—	Use Size 0	—
⅓	⅓	1½	2	00	—	0.75–3.4	A	14BUB82B*		Use Size 0	—	Use Size 0	—	Use Size 0	—
1½	1½	2	—	00	—	3–12	A1	14BUC82B*		Use Size 0	—	Use Size 0	—	Use Size 0	—
⅓	⅓	⅓	⅓	0	—	0.25–1	A	14CUA82B*		14CUA82@*		14CUA82H*		14CUA820*	
⅓	⅓	1½	2	0	—	0.75–3.4	A	14CUB82B*		14CUB82@*		14CUB82H*		14CUB820*	
2	2	5	5	0	—	3–12	A1	14CUC82B*		14CUC82@*		14CUC82H*		14CUC820*	
3	3	—	—	0	—	5.5–22	A1	14CUD82B*		14CUD82@*		14CUD82H*		14CUD820*	
⅓	⅓	⅓	⅓	1	—	0.25–1	A	14DUA82B*		14DUA82@*		14DUA82H*		14DUA820*	
⅓	⅓	1½	2	1	—	0.75–3.4	A	14DUB82B*		14DUB82@*		14DUB82H*		14DUB820*	
2	2	5	5	1	—	3–12	A1	14DUC82B*		14DUC82@*		14DUC82H*		14DUC820*	
3	3	10	10	1	—	5.5–22	A1	14DUD82B*		14DUD82@*		14DUD82H*		14DUD820*	
7½	7½	—	—	1	—	10–40	A1	14DUE82B*		14DUE82@*		14DUE82H*		14DUE820*	
10	10	15	15	—	1½	10–40	A1	14EUE82B*		14EUE82@*		14EUE82H*		14EUE820*	
10	15	25	25	2	—	13–52	B	14FUF82B*		14FUF82@*		14FUF82H*		14FUF820*	
15	20	30	30	—	2½	25–100	B	14GUG82B*		14GUG82@*		14GUG82H*		14GUG820*	
25	30	50	50	3	—	25–100	B	14HUG82B*		14HUG82@*		14HUG82H*		14HUG820*	
30	40	75	75	—	3½	50–200	B	14IUH82B*		14IUH82@*		14IUH82H*		14IUH820*	

Siemens Industry, Inc.
Industrial Controls Catalog

Heavy Duty Motor Starters

Ambient Compensated Bimetal Overload with Manual and Auto Reset, Class 14

Selection



Ordering Information

- Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- Heater elements see page 9/124. Single phase starters require 1 heater element. 3-phase starters require 3 heater elements.
- Field Modification Kits page 9/104.
- Factory Modifications page 9/119.
- Dimensions see page 9/140 open and 9/157 enclosed.
- Wiring Diagrams see page 9/173.
- Replacement Parts see page 9/131.
- For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A
200–208	D
220–240	G
277	L
220–240/440–480	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Contact- actor Amp Rating	NEMA Size	Half Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts				Open Type Standard Auxiliary Contacts ^②		NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant ② = W for 304 Stainless ② = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 NEMA 3/3R ^② Industrial Use Weatherproof	
							Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$
1½	1½	2	2	9	00	—	14BP32A*81		14BP32B*81		Use Size 0	—	Use Size 0	—	Use Size 0	—		
3	3	5	5	18	0	—	14CP32A*81		14CP32B*81		14CP32@*81		14CP32F*81		14CP32H*81	14CP320*81		
7½	7½	10	10	27	1	—	14DP32A*81		14DP32B*81		14DP32@*81		14DP32F*81		14DP32H*81	14DP320*81		
10	10	15	15	40	—	1¾	14EP32A*81		14EP32B*81		14EP32@*81		14EP32F*81		14EP32H*81	14EP320*81		
10	15	25	25	45	2	—	14FP32A*81		14FP32B*81		14FP32@*81		14FP32F*81		14FP32H*81	14FP320*81		
15	20	30	30	60	—	2½	14GP32A*81		14GP32B*81		14GP32@*81		14GP32F*81		14GP32H*81	14GP320*81		
25	30	50	50	90	3	—	14HP32A*81		14HP32B*81		14HP32@*81		14HP32F*81		14HP32H*81	14HP320*81		
30	40	75	75	115	—	3½	14IP32A*81		14IP32B*81		14IP32@*81		14IP32F*81		14IP32H*81	14IP320*81		
40	50	100	100	135	4	—	14JG32A*81		14JG32B*81		14JG32@*81		14JG32F*81		14JG32H*81	14JG320*81		

Open Type & Standard Width Enclosure, Single Phase, 2-Pole^③

Max Hp		Contactor Amp Rating	NEMA Size	Half Size	Enclosure											
115 Volts	208/ 230 Volts				Open Type	NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant ② = W for 304 Stainless Steel ② = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant Class II Groups E, F & G Class III		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Bolted Enclosures		NEMA 12 NEMA 3/3R ^② Industrial Use Weatherproof		
						Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No	\$	Catalog No
½	1	9	00	—	14BP12A*81		14BP12B*81		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1	2	18	0	—	14CP12A*81		14CP12B*81		14CP12@*81		14CP12F*81		14CP12H*81		14CP120*81	
2	3	27	1	—	14DP12A*81		14DP12B*81		14DP12@*81		14DP12F*81		14DP12H*81		14DP120*81	
3	5	35	1P	—	14EP12A*81		14EP12B*81		14EP12@*81		14EP12F*81		14EP12H*81		14EP120*81	
3	7½	45	2	—	14FP12A*81		14FP12B*81		14FP12@*81		14FP12F*81		14FP12H*81		14FP120*81	
5	10	60	—	2½	14GP12A*81		14GP12B*81		14GP12@*81		14GP12F*81		14GP12H*81		14GP120*81	

Extra Wide Enclosure, 3-Phase, 3-Pole^④

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 7 & 9. NEMA 3 & 4 Div 1 and Div 2 Class II Groups E, F & G Bolted Enclosures		NEMA 12. NEMA 3/3R ^② Industrial Use Weatherproof Class III	
Catalog No	Catalog No	Catalog No	Catalog No				Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$
1 1/2	1 1/2	2	2	9	00	—	14BP82B*81		Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	14CP82B*81		14CP82@*81		14CP82H*81		14CP820*81	
7 1/2	7 1/2	10	10	27	1	—	14DP82B*81		14DP82@*81		14DP82H*81		14DP820*81	
10	10	15	15	40	—	1 3/4	14EP82B*81		14EP82@*81		14EP82H*81		14EP820*81	
10	15	25	25	45	2	—	14FP82B*81		14FP82@*81		14FP82H*81		14FP820*81	
15	20	30	30	60	—	2 1/2	14GP82B*81		14GP82@*81		14GP82H*81		14GP820*81	
25	30	50	50	90	3	—	14HP82B*81		14HP82@*81		14HP82H*81		14HP820*81	
30	40	75	75	115	—	3 1/2	14IP82B*81		14IP82@*81		14IP82H*81		14IP820*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All Starter Sizes carry one maximum Hp rating. **For higher Hp single phase motors, use 3-phase starters, wire and set per diagram on page 9/173.**

① To receive a single phase starter in an extra wide enclosure, order the enclosure kit from pg 16-91 and the open style starter from pg 16-14 or 16-16 as separate items.

② For conduit hubs and conversion instructions, see page 9/110.

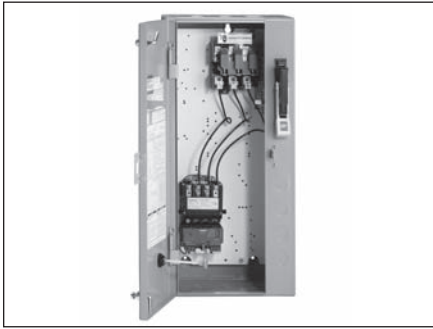
③ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.

④ Standard Auxiliary Contacts, Same as Contactors, refer to page 9/60.

Combination Heavy Duty Starters

Features and Benefits

General



Combination Starter Features

Combination starters include the following features:

- Manufactured with Cold Forming "TOX" Process
- Solid State Overloads Standard on Sizes 5-8
- Easy to Install
- Wide Range of Enclosure Types Available
- Heavy Duty Quarter Turns
- 100kA Short Circuit Current Rating when Protected with Class R Fuses to 600V or MCP to 480V
- Visible Blade Disconnect
- Industrial Type Disconnect Handle
- UL listed file #E185287 (class 17, 18, 25, 26 & 32)
- CSA certified file #LR 6535 (class 17, 18, 25, 26 & 32)

Application

A combination starter meets National Electrical Code requirements for:

1. A means of providing short circuit motor protection with fused or breaker disconnection of line voltage.
2. A means of safeguarding personnel from contact with live parts and from accidental starting of machinery by disconnecting the motor and the controller.
3. A motor controller with overload protection.

Prewired combination starters eliminate the cost of wiring between separate disconnect and starter. Factory testing assures field performance. Combination starters also provide a more compact and attractive installation than separate units.

Enclosure Types

Combination starters are available in NEMA 1, 12/3/3R/4 (painted), 4/4X

(stainless), 4X fiberglass and 7 & 9 enclosures. Enclosures protect personnel from contact with live parts and depending upon the construction, protect the control in varying degrees from physical damage and harmful atmospheres. All enclosures are supplied with corrosion resistant finishes.

Heavy Duty Disconnect Switches

The disconnect switch that goes the distance in durability, performance and reliability has the following advantages:

- Visible blades for the highest level of safety
- Double break switching action to reduce arcing, increase lifetime and eliminate the "electric hinge"
- More rugged positive action switch
- Oversized lugs are standard
- Line side shield to help guard personnel from contact with live parts
- Higher horsepower rating for design E high efficiency motors
- UL listed for IlSCO, Burndy and T&B crimp type lugs
- The 200A switch accepts up to 300 MCM versus 250 MCM wire size

Its rugged construction - with a high fault withstand rating of 100kA at 600 VAC when fused with class R rated fuses - meets the most stringent industry standards set forth by the automotive, petro-chemical, and pulp and paper industries. UL recognized and CSA certified, our disconnect switches are available either non-fusible or fusible with class R and class J fuse clips.



Enclosure Kits for NEMA Combination Starters Description

You can assemble a non-stocked combination starter per your unanticipated needs in minutes. Say, for example, your customer needs a fusible combination starter that you don't have in stock. You need in now, but don't sweat it.

Simply start with the enclosure kit which has the handle preinstalled. You install the required starter and fusible disconnect, connect the power wire and you are finished. Within minutes, you have the required combination starter in your hands. No more waiting on the factory. You need it, you got it!

What Is In It For You!

- **Reduce Lead-time** - What used to take days to get now takes minutes
- **Reduced Inventory** - Instead of stocking scores of various combination starters, simply stock a few enclosure kits, disconnect kits, circuit breaker kits and open starters. With these basic "building blocks" you virtually have hundreds of products on-hand
- **Quality** - The same high level of quality you have been accustomed to with our products will also be found in these new enclosure kits
- **UL Listed** - By correctly following the instructions included with the kits, the product you build is UL/CSA Listed

Refer to page 9/115 for more details.

Siemens Type ETI Circuit Breaker

The ETI circuit breaker is a device designed specifically for application in motor circuits. The ETI is a magnetic only protective device designed to provide protection against short circuit current.

The instantaneous-only type ETI circuit breaker employs adjustable magnetic trip settings to allow broader application ranges and a higher degree of motor short circuit protection.



Heavy Duty Starters

These combination starters use the same starters described in the heavy duty starter section of this catalog.

Combination Heavy Duty Starters

Non-Fusible with Solid State Overload, Class 17

Selection

A photograph of a Siemens heavy-duty starter enclosure with its door open, showing internal wiring and components. The enclosure is light gray and has a black door. Inside, there are two main components: a terminal block at the top and a contactor at the bottom. Wires are connected to the terminal block and the contactor. The door has a handle and a lock mechanism.

Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ For Fusible Styles see page 9/20.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/159.
- ▶ Wiring Diagrams see page 9/174.
- ▶ Replacement Parts see page 9/131.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 ^①	A
200–208	D
220–240	G
277	L
220–240/440–480 ^①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

Standard Width Enclosure, 3 Phase, 3-Pole

Max Hp						Overload		Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size		NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight, Corrosion Resistant ② = W for 304 Stainless Steel ② = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^③ , NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/8	1/8	1/8	1/8	0	—	0.25–1	A	30	17CUA92B*		17CUA92@*		17CUA92F*		17CUA92N*	
1/4	1/4	1/4	1/4	0	—	0.75–3.4	A	30	17CUB92B*		17CUB92@*		17CUB92F*		17CUB92N*	
2	2	5	5	0	—	3–12	A1	30	17CUC92B*		17CUC92@*		17CUC92F*		17CUC92N*	
3	3	—	—	0	—	5.5–22	A1	30	17CUD92B*		17CUD92@*		17CUD92F*		17CUD92N*	
1/8	1/8	1/8	1/8	1	—	0.25–1	A	30	17DUA92B*		17DUA92@*		17DUA92F*		17DUA92N*	
1/4	1/4	1/4	1/4	1	—	0.75–3.4	A	30	17DUB92B*		17DUB92@*		17DUB92F*		17DUB92N*	
2	2	5	5	1	—	3–12	A1	30	17DUC92B*		17DUC92@*		17DUC92F*		17DUC92N*	
3	3	10	10	1	—	5.5–22	A1	30	17DUD92B*		17DUD92@*		17DUD92F*		17DUD92N*	
7 1/2	7 1/2	—	—	1	—	10–40	A1	60	17DUE92B*		17DUE92@*		17DUE92F*		17DUE92N*	
10	10	15	15	—	1 1/2	10–40	A1	60	17EUE92B*		17EUE92@*		17EUE92F*		17EUE92N*	
10	15	25	25	2	—	13–52	B	60	17FUF92B*		17FUF92@*		17FUF92F*		17FUF92N*	
15	20	30	30	—	2 1/2	25–100	B	100 ^④	17GUG92B*		17GUG92@*		17GUG92F*		17GUG92N*	
20 ^⑤	25 ^⑤	50	50	3	—	25–100	B	100	17HUG92B*		17HUG92@*		17HUG92F*		17HUG92N*	
30	40	75	75	—	3 1/2	50–200	B	200	17IUH92B*		17IUH92@*		17IUH92F*		17IUH92N*	
40	50	100	100	4	—	50–200	B	200	17JUH92B*		17JUH92@*		17JUH92F*		17JUH92N*	
75	100	200	200	5	—	55–250	—	400 ^⑥	17LPU92B*		17LPU92E* ^⑦		—	—	17LPU92N*	
150	200	400	400	6	—	160–630	—	800	17MPX92B*		17MPX92E* ^⑦		—	—	17MPX92N*	
—	300	600	600	7 ^⑧	—	400–1220	A1+CT	1200	17NUN92B*		—	—	—	—	17NUN92N*	
—	450	900	900	8 ^⑧	—	400–1220	A1+CT	1600	17PUN92B*		—	—	—	—	17PUN92N*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in starter sizes 5–8.

② For conduit hubs and conversion instructions, see page 9/110.

③ For 60A disconnect, order fusible cat. no. page 9/20.

④ For 25 HP and 200A disconnect, order fusible cat. no. page 9/20.

⑤ For 30HP and 200A disconnect, order fusible cat. no. page 9/20.

⑥ For 600A disconnect, order fusible cat. no. page 9/20.

⑦ Enclosure is NEMA Type 4 (painted steel).

⑧ F coil 100–250V AC 50/60Hz, or DC, H coil 150–500V AC 50/60Hz, or DC


⑨ Only available

F coil 100–250V AC 50/60Hz, or DC

Combination Heavy Duty Starters

Non-Fusible with Solid State Overload, Class 17

Selection

	Ordering Information	Coil Table	
	<ul style="list-style-type: none">▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.▶ For Fusible Styles see page 9/21.▶ Field Modification Kits see page 9/104.▶ Factory Modifications see page 9/119.▶ Dimensions see page 9/159.▶ Wiring Diagrams see page 9/174.▶ Replacement Parts see page 9/131.	60Hz Voltage	Letter
		24	J
		120	F
		110–120/220–240 ^②	A
	200–208	D	
	220–240	G	
	277	L	
	220–240/440–480 ^②	C	
	440–480	H	
	575–600	E	
	For other voltages and frequencies, see Factory Modifications page 9/119.		

Extra Wide Enclosure, 3-Phase, 3-Pole

Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose		NEMA 4/4X Stainless ^③ Watertight, Dust-tight, Corrosion Resistant Ⓐ = W for 304 Stainless Steel Ⓐ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R ^③ , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
⅓	⅓	⅓	⅓	0	—	0.25–1	A	30	17CUA82B*		17CUA82Ⓐ*		17CUA82N*	
½	⅔	1½	2	0	—	0.75–3.4	A	30	17CUB82B*		17CUB82Ⓐ*		17CUB82N*	
2	2	5	5	0	—	3–12	A1	30	17CUC82B*		17CUC82Ⓐ*		17CUC82N*	
3	3	—	—	0	—	5.5–22	A1	30	17CUD82B*		17CUD82Ⓐ*		17CUD82N*	
⅓	⅓	⅓	⅓	1	—	0.25–1	A	30	17DUA82B*		17DUA82Ⓐ*		17DUA82N*	
½	⅔	1½	2	1	—	0.75–3.4	A	30	17DUB82B*		17DUB82Ⓐ*		17DUB82N*	
2	2	5	5	1	—	3–12	A1	30	17DUC82B*		17DUC82Ⓐ*		17DUC82N*	
3	3	10	10	1	—	5.5–22	A1	30	17DUD82B*		17DUD82Ⓐ*		17DUD82N*	
7½	7½	—	—	1	—	10–40	A1	60	17DUE82B*		17DUE82Ⓐ*		17DUE82N*	
10	10	15	15	—	1½	10–40	A1	60	17EUE82B*		17EUE82Ⓐ*		17EUE82N*	
10	15	25	25	2	—	13–52	B	60	17FUF82B*		17FUF82Ⓐ*		17FUF82N*	
15	20	30	30	—	2½	25–100	B	100 ^③	17GUG82B*		17GUG82Ⓐ*		17GUG82N*	
20 ^④	25 ^⑤	50	50	3	—	25–100	B	100	17HUG82B*		17HUG82Ⓐ*		17HUG82N*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① For conduit hubs and conversion instructions, see page 9/110.

② For 60A disconnect, order fusible cat. no. page 9/21.
③ For 25 HP and 200A disconnect, order fusible cat. no. page 9/21.


④ For 30HP and 200A disconnect, order fusible cat. no. page 9/21.

• Revised •
09/07/16

Combination Heavy Duty Starters

Non-Fusible with Ambient Compensated Bimetal Overload, Class 17

Selection

	Ordering Information	Coil Table	
		60Hz Voltage	Letter
	► Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.	24	J
	► Heater elements see page 9/124. (3 required)	120	F
	► Field Modification Kits see page 9/104.	110–120/220–240 ^①	A
	► Factory Modifications see page 9/119.	200–208	D
	► Dimensions see page 9/159.	220–240	G
	► Wiring Diagrams see page 9/174.	277	L
	► Replacement Parts see page 9/131.	220–240/440–480 ^①	C
	► For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.	440–480	H
		575–600	E
		For other voltages and frequencies, see Factory Modifications page 9/119.	

Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight Corrosion Resistant Ⓢ = W for 304 Stainless Steel Ⓢ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant Weatherproof		NEMA 12, NEMA 3/3R, ^① NEMA 4 Painted Industrial Use Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30	17CP92B*81		17CP92Ⓢ*81		17CP92F*81		17CP92N*81	
7½ ^③	7½ ^③	10	10	1	—	30	17DP92B*81		17DP92Ⓢ*81		17DP92F*81		17DP92N*81	
10	10	15	15	—	1¾	60	17EP92B*81		17EP92Ⓢ*81		17EP92F*81		17EP92N*81	
10	15	25	25	2	—	60	17FP92B*81		17FP92Ⓢ*81		17FP92F*81		17FP92N*81	
15	20	30	30	—	2½	100	17GP92B*81		17GP92Ⓢ*81		17GP92F*81		17GP92N*81	
25 ^④	30 ^④	50	50	3	—	100	17HP92B*81		17HP92Ⓢ*81		17HP92F*81		17HP92N*81	
30	40	75	75	—	3½	200	17IP92B*81		17IP92Ⓢ*81		17IP92F*81		17IP92N*81	
40	50	100	100	4	—	200	17JP92B*81		17JP92Ⓢ*81		17JP92F*81		17JP92N*81	

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight Corrosion Resistant Ⓢ = W for 304 Stainless Steel Ⓢ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R, ^① NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30	17CP82B*81		17CP82@*81		17CP82N*81	
7½ ^③	7½ ^③	10	10	1	—	30	17DP82B*81		17DP82@*81		17DP82N*81	
10	10	15	15	—	1¾	60	17EP82B*81		17EP82@*81		17EP82N*81	
10	15	25	25	2	—	60	17FP82B*81		17FP82@*81		17FP82N*81	
15	20	30	30	—	2½	100	17GP82B*81		17GP82@*81		17GP82N*81	
25 ^④	30 ^④	50	50	3	—	100	17HP82B*81		17HP82@*81		17HP82N*81	

Standard Width Enclosure, Single Phase, (Catalog Numbers are three phase, wire for single phase in the field)

Max Hp		NEMA Size	Half Size	Disc Amp Rating	Enclosure							
115 Volts	208/230 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^③ Watertight, Dust-tight Corrosion Resistant ② = W for 304 Stainless Steel ② = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R, ^③ NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
					Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1	2	0	—	30	17CP92B*81		17CP92@*81		17CP92F*81		17CP92N*81	
2	3	1	—	30	17DP92B*81		17DP92@*81		17DP92F*81		17DP92N*81	
3	5	1P	—	60	17EP92B*81		17EP92@*81		17EP92F*81		17EP92N*81	
3	7½	2	—	60	17FP92B*81		17FP92@*81		17FP92F*81		17FP92N*81	
5	10	—	2½	100	17GP92B*81		17GP92@*81		17GP92F*81		17GP92N*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① For conduit hubs and conversion instructions, see page 9/110.

② For 60A disc, order fusible cat. no. page 9/22.
③ For 200A disc, order fusible cat. no. page 9/22.

Combination Heavy Duty Starters

Fusible with Solid State Overload, Class 17

• Revised •
06/16/16

Selection



Ordering Information

- Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- Field Modification Kits see page 9/104.
- Factory Modifications see page 9/119.
- Dimensions see page 9/159.
- Wiring Diagrams see page 9/174.
- Replacement Parts see page 9/131.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 ^①	A
200–208	D
220–240	G
277	L
220–240/440–480 ^①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

Standard Width Enclosure, 3-Phase, 3-Pole^③

Max Hp						Overload		Disc. Amp Range	Fuse Clip Amp/Volts	Enclosure			
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Amp Range	Frame Size			NEMA 1 General Purpose	NEMA 4/4X Stainless ^② Watertight, Dust-tight, Corrosion Resistant ② = W for 304 Stainless Steel ② = X for 316 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R ^③ , NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/4	1/4	—	—	0	—	0.25–1	A	30	30A/250V	17CUA92B*10	17CUA92@*10	17CUA92F*10	17CUA92N*10
—	—	1/4	1/4	0	—	0.25–1	A	30	30A/600V	17CUA92B*11	17CUA92@*11	17CUA92F*11	17CUA92N*11
1/2	1/2	—	—	0	—	0.75–3.4	A	30	30A/250V	17CUB92B*10	17CUB92@*10	17CUB92F*10	17CUB92N*10
—	—	1 1/2	2	0	—	0.75–3.4	A	30	30A/600V	17CUB92B*11	17CUB92@*11	17CUB92F*11	17CUB92N*11
2	2	—	—	0	—	3–12	A1	30	30A/250V	17CUC92B*10	17CUC92@*10	17CUC92F*10	17CUC92N*10
—	—	5	5	0	—	3–12	A1	30	30A/600V	17CUC92B*11	17CUC92@*11	17CUC92F*11	17CUC92N*11
3	3	—	—	0	—	5.5–22	A1	30	30A/250V	17CUD92B*10	17CUD92@*10	17CUD92F*10	17CUD92N*11
1/4	1/4	—	—	1	—	0.25–1	A	30	30A/250V	17DUA92B*10	17DUA92@*10	17DUA92F*10	17DUA92N*10
—	—	1/4	1/4	1	—	0.25–1	A	30	30A/600V	17DUA92B*11	17DUA92@*11	17DUA92F*11	17DUA92N*11
1/2	1/2	—	—	1	—	0.75–3.4	A	30	30A/250V	17DUB92B*10	17DUB92@*10	17DUB92F*10	17DUB92N*10
—	—	1 1/2	2	1	—	0.75–3.4	A	30	30A/600V	17DUB92B*11	17DUB92@*11	17DUB92F*11	17DUB92N*11
2	2	—	—	1	—	3–12	A1	30	30A/250V	17DUC92B*10	17DUC92@*10	17DUC92F*10	17DUC92N*10
—	—	5	5	1	—	3–12	A1	30	30A/600V	17DUC92B*11	17DUC92@*11	17DUC92F*11	17DUC92N*11
3	3	—	—	1	—	5.5–22	A1	30	30A/250V	17DUD92B*10	17DUD92@*10	17DUD92F*10	17DUD92N*10
—	—	10	10	1	—	5.5–22	A1	30	30A/600V	17DUD92B*11	17DUD92@*11	17DUD92F*11	17DUD92N*11
7 1/2	7 1/2	—	—	1	—	10–40	A1	30	30A/250V	17DUE92B*10	17DUE92@*10	17DUE92F*10	17DUE92N*10
7 1/2	7 1/2	—	—	1	—	10–40	A1	60	60A/250V	17DUE92B*12	17DUE92@*12	17DUE92F*12	17DUE92N*12
—	—	15	15	—	1 1/4	10–40	A1	60	60A/600V	17EUE92B*13	17EUE92@*13	17EUE92F*13	17EUE92N*13
10	10	—	—	—	1 1/4	10–40	A1	60	60A/250V	17EUE92B*12	17EUE92@*12	17EUE92F*12	17EUE92N*12
10	15	—	—	2	—	13–52	B	60	60A/250V	17FUF92B*12	17FUF92@*12	17FUF92F*12	17FUF92N*12
—	—	25	25	2	—	13–52	B	60	60A/600V	17FUF92B*13	17FUF92@*13	17FUF92F*13	17FUF92N*13
—	—	—	30	—	2 1/4	25–100	B	60	60A/600V	17GUG92B*13	17GUG92@*13	17GUG92F*13	17GUG92N*13
—	—	30	—	—	2 1/4	25–100	B	100	100A/600V	17GUG92B*15	17GUG92@*15	17GUG92F*15	17GUG92N*15
15	20	—	—	—	2 1/4	25–100	B	100	100A/250V	17GUG92B*14	17GUG92@*14	17GUG92F*14	17GUG92N*14
20	25	—	—	3	—	25–100	B	100	100A/250V	17HUG92B*14	17HUG92@*14	17HUG92F*14	17HUG92N*14
—	—	50	50	3	—	25–100	B	100	100A/600V	17HUG92B*15	17HUG92@*15	17HUG92F*15	17HUG92N*15
25	30	—	—	3	—	25–100	B	200	200A/250V	17HUG92B*16	17HUG92@*16	17HUG92F*16	17HUG92N*16
30	40	—	—	—	3 1/2	50–200	B	200	200A/250V	17IUH92B*16	17IUH92@*16	17IUH92F*16	17IUH92N*16
—	—	75	75	—	3 1/2	50–200	B	200	200A/600V	17IUH92B*17	17IUH92@*17	17IUH92F*17	17IUH92N*17
40	50	—	—	4	—	50–200	B	200	200A/250V	17JUH92B*16	17JUH92@*16	17JUH92F*16	17JUH92N*16
—	—	100	100	4	—	50–200	B	200	200A/600V	17JUH92B*17	17JUH92@*17	17JUH92F*17	17JUH92N*17
75	100	—	—	5	—	55–250	—	400	400A/250V	17LPU92B*18	17LPU92@*18 ^④	—	17LPU92N*18
—	100	—	—	5	—	55–250	—	600	600A/250V ^⑤	17LPU92B*20	17LPU92@*20 ^④	—	17LPU92N*20
—	—	125	—	5	—	55–250	—	200	200A/600V	17LPU92B*17	17LPU92@*17 ^④	—	17LPU92N*17
—	—	200	200	5	—	55–250	—	400	400A/600V	17LPU92B*19	17LPU92@*19 ^④	—	17LPU92N*19
—	—	200	—	5	—	55–250	—	600	600A/600V ^⑤	17LPU92B*21	17LPU92@*21 ^④	—	17LPU92N*21
150	200	—	—	6	—	160–630	—	600	600A/250V	17MPX92B*20	17MPX92@*20 ^④	—	17MPX92N*20
—	—	400	400	6	—	160–630	—	600	600A/600V	17MPX92B*21	17MPX92@*21 ^④	—	17MPX92N*21
—	—	400	400	6	—	160–630	—	800	800A/600V	17MPX92B*23	17MPX92@*23 ^④	—	17MPX92N*23
—	—	600	600	7 ^⑥	—	400–1220	A1+CT	1200	1200A/600V	17NUN92B*24	—	—	17NUN92N*24
—	—	900	900	8 ^⑦	—	400–1220	A1+CT	1600	1600A/600V	17PUN92B*25	—	—	17PUN92N*25

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in starter sizes 5–8.

② For conduit hubs and conversion instructions, see page 9/110.

③ Use Class J fuses only.

④ Enclosure is NEMA Type 4 (painted steel).

⑤ Single phase wiring page 9/173.

⑥ F coil 100–250V AC 50/60Hz, or DC,
H coil 150–500V AC 50/60Hz, or DC


⑦ Only available

F coil 100–250V AC 50/60Hz, or DC

Combination Heavy Duty Starters

Fusible with Solid State Overload, Class 17

Selection

	Ordering Information		Coil Table	
	<ul style="list-style-type: none">▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.▶ Field Modification Kits see page 9/104.▶ Factory Modifications see page 9/119.▶ Dimensions see page 9/159.▶ Wiring Diagrams see page 9/174.▶ Replacement Parts see page 9/131.		60Hz Voltage	Letter
			24	J
			120	F
			110–120/220–240	A
			200–208	D
			220–240	G
			277	L
			220–240/440–480	C
			440–480	H
			575–600	E
			For other voltages and frequencies, see Factory Modifications page 9/119.	

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Fuse Clip Amp/Volts	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size			NEMA 1 General Purpose	NEMA 4/4X Stainless ^① Watertight, Dust-tight, ② = W for 304 Stainless Steel ③ = X for 316 Stainless Steel	NEMA 12, NEMA 3/3R ^① , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight			
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$										
17CUA82B*10		17CUA82@*10		17CUA82N*10											
17CUA82B*11		17CUA82@*11		17CUA82N*11											
17CUB82B*10		17CUB82@*10		17CUB82N*10											
17CUB82B*11		17CUB82@*11		17CUB82N*11											
17CUC82B*10		17CUC82@*10		17CUC82N*10											
17CUC82B*11		17CUC82@*11		17CUC82N*11											
17CUD82B*10		17CUD82@*10		17CUD82N*10											
17DUA82B*10		17DUA82@*10		17DUA82N*10											
17DUA82B*11		17DUA82@*11		17DUA82N*11											
17DUB82B*10		17DUB82@*10		17DUB82N*10											
17DUB82B*11		17DUB82@*11		17DUB82N*11											
17DUC82B*10		17DUC82@*10		17DUC82N*10											
17DUC82B*11		17DUC82@*11		17DUC82N*11											
17DUD82B*10		17DUD82@*10		17DUD82N*10											
17DUD82B*11		17DUD82@*11		17DUD82N*11											
17DUE82B*10		17DUE82@*10		17DUE82N*10											
17DUE82B*12		17DUE82@*12		17DUE82N*12											
17EUE82B*13		17EUE82@*13		17EUE82N*13											
17EUE82B*12		17EUE82@*12		17EUE82N*12											
17FUF82B*12		17FUF82@*12		17FUF82N*12											
17FUF82B*13		17FUF82@*13		17FUF82N*13											
17GUG82B*13		17GUG82@*13		17GUG82N*13											
17GUG82B*15		17GUG82@*15		17GUG82N*15											
17GUG82B*14		17GUG82@*14		17GUG82N*14											
17HUG82B*14		17HUG82@*14		17HUG82N*14											
17HUG82B*15		17HUG82@*15		17HUG82N*15											
17HUG82B*16		17HUG82@*16		17HUG82N*16											

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).


^① For conduit hubs and conversion instructions, see page 9/110.

Combination Heavy Duty Starters

Fusible with Ambient Compensated Bimetal Overload, Class 17

• Revised •
09/07/16

Selection

	Ordering Information	Coil Table																				
	<ul style="list-style-type: none">▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.▶ Heater elements see page 9/124. (3 required)▶ Field Modification Kits see page 9/104.▶ Factory Modifications see page 9/119.▶ Dimensions see page 9/159.▶ Wiring Diagrams see page 9/174.▶ Replacement Parts see page 9/131.▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.	<table><tr><th>60Hz Voltage</th><th>Letter</th></tr><tr><td>24</td><td>J</td></tr><tr><td>120</td><td>F</td></tr><tr><td>110–120/220–240</td><td>A</td></tr><tr><td>200–208</td><td>D</td></tr><tr><td>220–240</td><td>G</td></tr><tr><td>277</td><td>L</td></tr><tr><td>220–240/440–480</td><td>C</td></tr><tr><td>440–480</td><td>H</td></tr><tr><td>575–600</td><td>E</td></tr></table>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E
		60Hz Voltage	Letter																			
		24	J																			
120	F																					
110–120/220–240	A																					
200–208	D																					
220–240	G																					
277	L																					
220–240/440–480	C																					
440–480	H																					
575–600	E																					
For other voltages and frequencies, see Factory Modifications page 9/119.																						

Standard Width Enclosure, 3-Phase, 3-Pole^②

Max Hp								Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Size Amps/Volts	NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R, ^① NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30	30A/250V 30A/600V	17CP92B*1081		17CP92@*1081		17CP92F*1081		17CP92N*1081	
—	—	—	—	0	—	30	30A/600V	17CP92B*1181		17CP92@*1181		17CP92F*1181		17CP92N*1181	
5	5	—	—	1	—	30	30A/250V	17DP92B*1081		17DP92@*1081		17DP92F*1081		17DP92N*1081	
—	—	10	10	1	—	30	30A/600V	17DP92B*1181		17DP92@*1181		17DP92F*1181		17DP92N*1181	
7½	7½	—	—	1	—	60	60A/250V	17DP92B*1281		17DP92@*1281		17DP92F*1281		17DP92N*1281	
10	10	—	—	—	1¼	60	60A/250V	17EP92B*1281		17EP92@*1281		17EP92F*1281		17EP92N*1281	
—	—	15	15	—	1¼	60	60A/600V	17EP92B*1381		17EP92@*1381		17EP92F*1381		17EP92N*1381	
10	15	—	—	2	—	60	60A/250V	17FP92B*1281		17FP92@*1281		17FP92F*1281		17FP92N*1281	
—	—	25	25	2	—	60	60A/600V	17FP92B*1381		17FP92@*1381		17FP92F*1381		17FP92N*1381	
—	—	30	30	—	2½	60	60A/600V	17GP92B*1381		17GP92@*1381		17GP92F*1381		17GP92N*1381	
—	—	30	—	—	2½	100	100A/600V	17GP92B*1581		17GP92@*1581		17GP92F*1581		17GP92N*1581	
15	20	—	—	—	2½	100	100A/250V	17GP92B*1481		17GP92@*1481		17GP92F*1481		17GP92N*1481	
20	25	—	—	3	—	100	100A/250V	17HP92B*1481		17HP92@*1481		17HP92F*1481		17HP92N*1481	
—	—	50	50	3	—	100	100A/600V	17HP92B*1581		17HP92@*1581		17HP92F*1581		17HP92N*1581	
25	30	—	—	3	—	200	200A/250V	17HP92B*1681		17HP92@*1681		17HP92F*1681		17HP92N*1681	
30	40	—	—	—	3½	200	200A/250V	17IP92B*1681		17IP92@*1681		17IP92F*1681		17IP92N*1681	
—	—	75	75	—	3½	200	200A/600V	17IP92B*1781		17IP92@*1781		17IP92F*1781		17IP92N*1781	
40	50	—	—	4	—	200	200A/250V	17JP92B*1681		17JP92@*1681		17JP92F*1681		17JP92N*1681	
—	—	100	100	4	—	200	200A/600V	17JP92B*1781		17JP92@*1781		17JP92F*1781		17JP92N*1781	

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp								Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Size Amps/Volts	NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight Industrial Use Weatherproof @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R, ^① NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight			
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	—	—	0	—	30	30A/250V	17CP82B*1081		17CP82@*1081		17CP82N*1081			
—	—	5	5	0	—	30	30A/600V	17CP82B*1181		17CP82@*1181		17CP82N*1181			
5	5	—	—	1	—	30	30A/250V	17DP82B*1081		17DP82@*1081		17DP82N*1081			
—	—	10	10	1	—	30	30A/600V	17DP82B*1181		17DP82@*1181		17DP82N*1181			
7½	7½	—	—	1	—	60	60A/250V	17DP82B*1281		17DP82@*1281		17DP82N*1281			
10	10	—	—	—	1¼	60	60A/250V	17EP82B*1281		17EP82@*1281		17EP82N*1281			
—	—	15	15	—	1¼	60	60A/600V	17EP82B*1381		17EP82@*1381		17EP82N*1381			
10	15	—	—	2	—	60	60A/250V	17FP82B*1281		17FP82@*1281		17FP82N*1281			
—	—	25	25	2	—	60	60A/600V	17FP82B*1381		17FP82@*1381		17FP82N*1381			
—	—	30	30	—	2½	60	60A/600V	17GP82B*1381		17GP82@*1381		17GP82N*1381			
—	—	30	—	—	2½	100	100A/600V	17GP82B*1581		17GP82@*1581		17GP82N*1581			
15	20	—	—	—	2½	100	100A/250V	17GP82B*1481		17GP82@*1481		17GP82N*1481			
20	25	—	—	3	—	100	100A/250V	17HP82B*1481		17HP82@*1481		17HP82N*1481			
—	—	50	50	3	—	100	100A/600V	17HP82B*1581		17HP82@*1581		17HP82N*1581			
25	30	—	—	3	—	200	200A/250V	17HP82B*1681		17HP82@*1681		17HP82N*1681			

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.


① For conduit hubs and conversion instructions, see page 9/110.

② Single phase wiring page 9/173.

Combination Heavy Duty Starters

MCP Type with Solid State Overload, Class 18

Selection

	Ordering Information		Coil Table	
	<ul style="list-style-type: none">▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.▶ Field Modification Kits see page 9/104.▶ Factory Modifications see page 9/119.▶ Dimensions see page 9/159.▶ Wiring Diagrams see page 9/174.▶ Replacement Parts see page 9/131.	60Hz Voltage		Letter
		24	J	
		120	F	
		110–120/220–240 ^①	A	
	200–208	D		
	220–240	G		
	277	L		
	220–240/440–480 ^①	C		
	440–480	H		
	575–600	E		
	For other voltages and frequencies, see Factory Modifications page 9/119.			

Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight, Corrosion Resistant ② = W for 304 Stainless Steel ② = X for 316 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12, NEMA 3/3R ^③ , NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	
1/2	1/2	1	1	0	—	3	0.75–3.4	A	18CUB92B*	—	18CUB92@*	—	18CUB92F*	—	18CUB92H*	—	18CUB92N*	—
2	2	5	5	0	—	10	3–12	A1	18CUC92B*	—	18CUC92@*	—	18CUC92F*	—	18CUC92H*	—	18CUC92N*	—
3	3	—	—	0	—	25	5.5–22	A1	18CUD92B*	—	18CUD92@*	—	18CUD92F*	—	18CUD92H*	—	18CUD92N*	—
1/2	1/2	1	1	1	—	3	0.75–3.4	A	18DUB92B*	—	18DUB92@*	—	18DUB92F*	—	18DUB92H*	—	18DUB92N*	—
2	2	5	5	1	—	10	3–12	A1	18DUC92B*	—	18DUC92@*	—	18DUC92F*	—	18DUC92H*	—	18DUC92N*	—
3	3	7 1/2	10	1	—	25	5.5–22	A1	18DUD92B*	—	18DUD92@*	—	18DUD92F*	—	18DUD92H*	—	18DUD92N*	—
7 1/2	7 1/2	10	—	1	—	30	10–40	A1	18DUE92B*	—	18DUE92@*	—	18DUE92F*	—	18DUE92H*	—	18DUE92N*	—
—	—	15	15	—	1 1/4	40	10–40	A1	18EUE92B*	—	18EUE92@*	—	18EUE92F*	—	18EUE92H*	—	18EUE92N*	—
10	15	25	25	2	—	50	13–52	B	18FUF92B*	—	18FUF92@*	—	18FUF92F*	—	18FUF92H*	—	18FUF92N*	—
15	20	30	30	—	2 1/2	100	25–100	B	18GUG92B*	—	18GUG92@*	—	18GUG92F*	—	18GUG92H*	—	18GUG92N*	—
25	30	50	50	3	—	125	25–100	B	18HUG92B*	—	18HUG92@*	—	18HUG92F*	—	18HUG92H*	—	18HUG92N*	—
30	40	75	75	—	3 1/2	125	50–200	B	18IUH92B*	—	18IUH92@*	—	18IUH92F*	—	18IUH92H*	—	18IUH92N*	—
40	50	100	100	4	—	150	50–200	B	18JUH92B*	—	18JUH92@*	—	18JUH92F*	—	18JUH92H*	—	18JUH92N*	—
50	75	150	200	5	—	250	55–250	—	18LPT92B*	—	18LPT92E* ^③	—	—	—	18LPT92H*	—	18LPT92N*	—
75	100	200	—	5	—	400	55–250	—	18LPW92B*	—	18LPW92E* ^③	—	—	—	—	—	18LPW92N*	—
100	125	250	300	6	—	400	160–630	—	18MPW92B*	—	18MPW92E* ^③	—	—	—	—	—	18MPW92N*	—
150	200	400	400	6	—	600	160–630	—	18MPX92B*	—	18MPX92E* ^③	—	—	—	—	—	18MPX92N*	—
—	250	500	500	7 ^④	—	800	400–1220	A1+CT	18NUV92B*	—	—	—	—	—	—	—	18NUV92N*	—
—	300	600	600	7 ^④	—	1000	400–1220	A1+CT	18NUY92B*	—	—	—	—	—	—	—	18NUY92N*	—
—	400	800	800	8 ^⑤	—	1200	400–1220	A1+CT	18PUW92B*	—	—	—	—	—	—	—	18PUW92N*	—
—	450	900	900	8 ^⑤	—	1600	400–1220	A1+CT	18PUZ92B*	—	—	—	—	—	—	—	18PUZ92N*	—

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in starter sizes 5–8.

② For conduit hubs and conversion instructions, see page 9/110.

③ Enclosure is NEMA Type 4 (painted steel).

④ F coil 100–250V AC 50/60Hz, or DC, H coil 150–500V AC 50/60Hz, or DC


⑤ Only available

F coil 100–250V AC 50/60Hz, or DC

Combination Heavy Duty Starters

MCP Type with Solid State Overload, Class 18

Selection

	Ordering Information	Coil Table																		
	<ul style="list-style-type: none">▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.▶ Field Modification Kits see page 9/104.▶ Factory Modifications see page 9/119.▶ Dimensions see page 9/159.▶ Wiring Diagrams see page 9/174.▶ Replacement Parts see page 9/131.	60Hz Voltage	Letter																	
	<table><tr><td>24</td><td>J</td></tr><tr><td>120</td><td>F</td></tr><tr><td>110–120/220–240</td><td>A</td></tr><tr><td>200–208</td><td>D</td></tr><tr><td>220–240</td><td>G</td></tr><tr><td>277</td><td>L</td></tr><tr><td>220–240/440–480</td><td>C</td></tr><tr><td>440–480</td><td>H</td></tr><tr><td>575–600</td><td>E</td></tr></table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E	
24	J																			
120	F																			
110–120/220–240	A																			
200–208	D																			
220–240	G																			
277	L																			
220–240/440–480	C																			
440–480	H																			
575–600	E																			

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight, Corrosion Resistant @ = W for 304 Stainless Steel @ = X for 316 Stainless Steel		NEMA 12, NEMA 3/3R ^① , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1	1	0	—	3	0.75–3.4	A	18CUB82B*		18CUB82@*		18CUB82N*	
2	2	5	5	0	—	10	3–12	A1	18CUC82B*		18CUC82@*		18CUC82N*	
3	3	—	—	0	—	25	5.5–22	A1	18CUD82B*		18CUD82@*		18CUD82N*	
1/2	1/2	1	1	1	—	3	0.75–3.4	A	18DUB82B*		18DUB82@*		18DUB82N*	
2	2	5	5	1	—	10	3–12	A1	18DUC82B*		18DUC82@*		18DUC82N*	
3	3	7 1/2	10	1	—	25	5.5–22	A1	18DUD82B*		18DUD82@*		18DUD82N*	
7 1/2	7 1/2	10	—	1	—	30	10–40	A1	18DUE82B*		18DUE82@*		18DUE82N*	
—	—	15	15	—	1 1/2	40	10–40	A1	18EUE82B*		18EUE82@*		18EUE82N*	
10	15	25	25	2	—	50	13–52	B	18FUF82B*		18FUF82@*		18FUF82N*	
15	20	30	30	—	2 1/2	100	25–100	B	18GUG82B*		18GUG82@*		18GUG82N*	
25	30	50	50	3	—	125	25–100	B	18HUG82B*		18HUG82@*		18HUG82N*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

^① For conduit hubs and conversion instructions, see page 9/110.

• Revised •
09/07/16

Combination Heavy Duty Starters

MCP Type with Ambient Compensated Bimetal Overload, Class 18

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 9/124. (3 required)
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/159.
- ▶ Wiring Diagrams see page 9/174.
- ▶ Replacement Parts see page 9/131.
- ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A
200–208	D
220–240	G
277	L
220–240/440–480	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose Watertight, Dust-tight		NEMA 4/4X Stainless ^① Watertight, Dust-tight Corrosion Resistant ⓐ = W for 304 Stainless Steel ⓐ = X for 316 Stainless Steel		NEMA 4X Fiberglass NEMA 3 & 4 Corrosion Resistant Class I Groups C & D Class II Groups E, F & G		NEMA 7 & 9 Div 1 and Div 2 Weatherproof Watertight, Dust-tight Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12,NEMA 3/3R, ^① NEMA 4 Painted Industrial Use	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
½	½	1	1	0	—	3	18CP92BA*81	18CP92@A*81	18CP92FA*81	18CP92HA*81	18CP92NA*81					
1	1	3	3	0	—	10	18CP92BB*81	18CP92@B*81	18CP92FB*81	18CP92HB*81	18CP92NB*81					
3	3	5	5	0	—	25	18CP92BC*81	18CP92@C*81	18CP92FC*81	18CP92HC*81	18CP92NC*81					
½	½	1	1	1	—	3	18DP92BA*81	18DP92@A*81	18DP92FA*81	18DP92HA*81	18DP92NA*81					
1	1	3	3	1	—	10	18DP92BB*81	18DP92@B*81	18DP92FB*81	18DP92HB*81	18DP92NB*81					
3	3	7½	7½	1	—	25	18DP92BD*81	18DP92@D*81	18DP92FD*81	18DP92HD*81	18DP92ND*81					
7½	7½	10	10	1	—	30	18DP92BE*81	18DP92@E*81	18DP92FE*81	18DP92HE*81	18DP92NE*81					
—	—	15	15	—	1¼	40	18EP92BF*81	18EP92@F*81	18EP92FF*81	18EP92HF*81	18EP92NF*81					
10	10	—	—	—	1¼	50	18EP92BG*81	18EP92@G*81	18EP92FG*81	18EP92HG*81	18EP92NG*81					
—	—	20	20	2	—	40	18FP92BH*81	18FP92@H*81	18FP92FH*81	18FP92HH*81	18FP92NH*81					
10	15	25	25	2	—	50	18FP92BJ*81	18FP92@J*81	18FP92FJ*81	18FP92HJ*81	18FP92NJ*81					
10	15	30	30	—	2½	50	18GP92BK*81	18GP92@K*81	18GP92FK*81	18GP92HK*81	18GP92NK*81					
15	20	—	—	—	2½	100	18GP92BL*81	18GP92@L*81	18GP92FL*81	18GP92HL*81	18GP92NL*81					
—	—	30	30	3	—	50	18HP92BM*81	18HP92@M*81	18HP92FM*81	18HP92HM*81	18HP92NM*81					
25	30	50	50	3	—	125	18HP92BN*81	18HP92@N*81	18HP92FN*81	18HP92HN*81	18HP92NN*81					
30	40	75	75	—	3½	125	18IP92BP*81	18IP92@P*81	18IP92FP*81	18IP92HP*81	18IP92NP*81					
40	50	100	100	4	—	150	18JP92BR*81	18JP92@R*81	18JP92FR*81	18JP92HR*81	18JP92NR*81					

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight Corrosion Resistant @=V for 304 Stainless Steel @=X for 316 Stainless Steel		NEMA 12, NEMA 3/3R, ^① NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
½	½	1	1	0	—	3	18CP82BA*81		18CP82@A*81		18CP82NA*81	
1	1	3	3	0	—	10	18CP82BB*81		18CP82@B*81		18CP82NB*81	
3	3	5	5	0	—	25	18CP82BC*81		18CP82@C*81		18CP82NC*81	
½	½	1	1	1	—	3	18DP82BA*81		18DP82@A*81		18DP82NA*81	
1	1	3	3	1	—	10	18DP82BB*81		18DP82@B*81		18DP82NB*81	
3	3	7½	7½	1	—	25	18DP82BD*81		18DP82@D*81		18DP82ND*81	
7½	7½	10	10	1	—	30	18DP82BE*81		18DP82@E*81		18DP82NE*81	
—	—	15	15	—	1¼	40	18EP82BF*81		18EP82@F*81		18EP82NF*81	
10	10	—	—	—	1¼	50	18EP82BG*81		18EP82@G*81		18EP82NG*81	
—	—	20	20	2	—	40	18FP82BH*81		18FP82@H*81		18FP82NH*81	
10	15	25	25	2	—	50	18FP82BJ*81		18FP82@J*81		18FP82NJ*81	
10	15	30	30	—	2½	50	18GP82BK*81		18GP82@K*81		18GP82NK*81	
15	20	—	—	—	2½	100	18GP82BL*81		18GP82@L*81		18GP82NL*81	
—	—	30	30	3	—	50	18HP82BM*81		18HP82@M*81		18HP82NM*81	
25	30	50	50	3	—	125	18HP82BN*81		18HP82@N*81		18HP82NN*81	

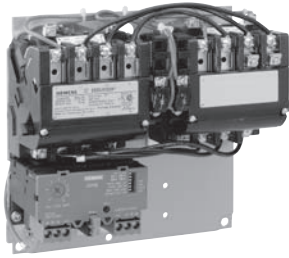
Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① For conduit hubs and conversion instructions, see page 9/110.

Reversing Heavy Duty Starters

Solid State Overload, Class 22

Selection



Ordering Information

- Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- Field Modification Kits see page 9/104.
- Factory Modifications see page 9/119.
- Dimensions see page 9/142 open and 9/162 enclosed.
- Wiring Diagrams see page 9/176.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 ^①	A
200–208	D
220–240	G
277	L
220–240/440–480 ^①	C
440–480	H
575–600	E
For other voltages and frequencies, see Factory Modifications page 9/119.	

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload		Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size	Open Type Standard Auxiliary Contacts ^②	NEMA 1 General Purpose	NEMA 4/4X Stainless ^③ Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/ Outdoor Use	NEMA 12 NEMA 3/3R ^④ Industrial Use Weatherproof (Field Convertible to 3/3R)						
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/4	1/4	1/4	1/4	00	—	0.25–1	A	22BUA32A*	22BUA32B*	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1/2	1/2	1 1/2	2	00	—	0.75–3.4	A	22BUB32A*	22BUB32B*	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1 1/2	1 1/2	2	—	00	—	3–12	A1	22BUC32A*	22BUC32B*	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1/4	1/4	1/2	1/2	0	—	0.25–1	A	22CUA32A*	22CUA32B*	22CUA32W*	—	22CUA32F*	—	22CUA32H*	—	22CUA320*	—	22CUA320*	—
1/2	1/2	1 1/2	2	0	—	0.75–3.4	A	22CUB32A*	22CUB32B*	22CUB32W*	—	22CUB32F*	—	22CUB32H*	—	22CUB320*	—	22CUB320*	—
2	2	5	5	0	—	3–12	A1	22CUC32A*	22CUC32B*	22CUC32W*	—	22CUC32F*	—	22CUC32H*	—	22CUC320*	—	22CUC320*	—
3	3	—	—	0	—	5.5–22	A1	22CUD32A*	22CUD32B*	22CUD32W*	—	22CUD32F*	—	22CUD32H*	—	22CUD320*	—	22CUD320*	—
1/4	1/4	1/2	1/2	1	—	0.25–1	A	22DUA32A*	22DUA32B*	22DUA32W*	—	22DUA32F*	—	22DUA32H*	—	22DUA320*	—	22DUA320*	—
1/2	1/2	1 1/2	2	1	—	0.75–3.4	A	22DUB32A*	22DUB32B*	22DUB32W*	—	22DUB32F*	—	22DUB32H*	—	22DUB320*	—	22DUB320*	—
2	2	5	5	1	—	3–12	A1	22DUC32A*	22DUC32B*	22DUC32W*	—	22DUC32F*	—	22DUC32H*	—	22DUC320*	—	22DUC320*	—
3	3	10	10	1	—	5.5–22	A1	22DUD32A*	22DUD32B*	22DUD32W*	—	22DUD32F*	—	22DUD32H*	—	22DUD320*	—	22DUD320*	—
7 1/2	7 1/2	—	—	1	—	10–40	A1	22DUE32A*	22DUE32B*	22DUE32W*	—	22DUE32F*	—	22DUE32H*	—	22DUE320*	—	22DUE320*	—
10	10	15	15	—	1 1/2	10–40	A1	22EUE32A*	22EUE32B*	22EUE32W*	—	22EUE32F*	—	22EUE32H*	—	22EUE320*	—	22EUE320*	—
10	15	25	25	2	—	13–52	B	22FUF32A*	22FUF32B*	22FUF32W*	—	22FUF32F*	—	22FUF32H*	—	22FUF320*	—	22FUF320*	—
15	20	30	30	—	2 1/2	25–100	B	22GUG32A*	22GUG32B*	22GUG32W*	—	22GUG32F*	—	22GUG32H*	—	22GUG320*	—	22GUG320*	—
25	30	50	50	3	—	25–100	B	22HUG32A*	22HUG32B*	22HUG32W*	—	22HUG32F*	—	22HUG32H*	—	22HUG320*	—	22HUG320*	—
30	40	75	75	—	3 1/2	50–200	B	22IUH32A*	22IUH32B*	22IUH32W*	—	22IUH32F*	—	22IUH32H*	—	22IUH320*	—	22IUH320*	—
40	50	100	100	4	—	50–200	B	22JUH32A*	22JUH32B*	22JUH32W*	—	22JUH32F*	—	22JUH32H*	—	22JUH320*	—	22JUH320*	—
75	100	200	200	5	—	55–250	—	22LPU32A*	22LPU32B*	22LPU32E* ^⑤	—	—	—	—	—	22LPU320*	—	22LPU320*	—
150	200	400	400	6	—	160–630	—	22MPX32A*	22MPX32B*	22MPX32E* ^⑤	—	—	—	—	—	22MPX320*	—	22MPX320*	—
—	300	600	600	7 ^⑥	—	400–1220	A1+CT	22NUN32A*	22NUN32B*	—	—	—	—	—	—	22NUN320*	—	22NUN320*	—
—	450	900	900	8 ^⑥	—	400–1220	A1+CT	22PUN32A*	22PUN32B*	—	—	—	—	—	—	22PUN320*	—	22PUN320*	—

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

- ① Dual voltage coils not available in size 5–8 starters.
 ② For conduit hubs and conversion instructions, see page 9/110.

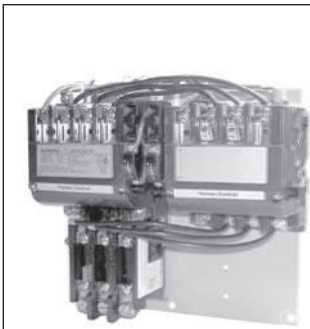
- ③ Enclosure is rated only NEMA 4 (painted steel).
 ④ Only available
 F coil 100–250V AC 50/60Hz, or DC
 H coil 150–500V AC 50/60Hz, or DC
 ⑤ Only available
 F coil 100–250V AC 50/60Hz, or DC

- ⑥ Auxiliary contacts
 22B–22E 4th pole built-in
 22F–22J 2 NO & 2 NC

Reversing Heavy Duty Starters

Ambient Compensated Bimetal Overload with Manual and Auto Reset, Class 22

Selection



Ordering Information

- Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- Heater elements see page 9/124. Single phase starters require 1 heater element. 3-phase starters require 3 heater elements.
- Field Modification Kits see page 9/104.
- Factory Modifications see page 9/119.
- Dimensions see pages 9/142 open and 9/162 enclosed.
- Wiring Diagrams see page 9/175.
- Replacement Parts see page 9/131.
- For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A
200–208	D
220–240	G
277	L
220–240/440–480	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts				Open Type ^③		NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant Indoor/Outdoor Use		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures		NEMA 12 ^① NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1½	1½	2	2	9	00	—	22BP32A*81		22BP32B*81		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	22CP32A*81		22CP32B*81		22CP32W*81		22CP32F*81		22CP32H*81		22CP32O*81	
7½	7½	10	10	27	1	—	22DP32A*81		22DP32B*81		22DP32W*81		22DP32F*81		22DP32H*81		22DP32O*81	
10	10	15	15	40	—	1¼	22EP32A*81		22EP32B*81		22EP32W*81		22EP32F*81		22EP32H*81		22EP32O*81	
10	15	25	25	45	2	—	22FP32A*81		22FP32B*81		22FP32W*81		22FP32F*81		22FP32H*81		22FP32O*81	
15	20	30	30	60	—	2½	22GP32A*81		22GP32B*81		22GP32W*81		22GP32F*81		22GP32H*81		22GP32O*81	
25	30	50	50	90	3	—	22HP32A*81		22HP32B*81		22HP32W*81		22HP32F*81		22HP32H*81		22HP32O*81	
30	40	75	75	115	—	3½	22IP32A*81		22IP32B*81		22IP32W*81		22IP32F*81		22IP32H*81		22IP32O*81	
40	50	100	100	135	4	—	22JG32A*81		22JG32B*81		22JG32W*81		22JG32F*81		22JG32H*81		22JG32O*81	

Open Type & Standard Width Enclosure, Single Phase, 3-Wire, 2-Pole^②

Max Hp		Contactor Amp Rating	NEMA Size	Enclosure											
115 Volts	208/230 Volts			Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 ^① NEMA 3/3R Industrial Use Weatherproof	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
½	1	9	00	22BP12A*81	22BP12B*81	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1	2	18	0	22CP12A*81	22CP12B*81	22CP12W*81	22CP12F*81	22CP12H*81	22CP12J*81	22CP12L*81	22CP12M*81	22CP12N*81	22CP12O*81	22CP12P*81	22CP12Q*81
2	3	27	1	22DP12A*81	22DP12B*81	22DP12W*81	22DP12F*81	22DP12H*81	22DP12J*81	22DP12L*81	22DP12M*81	22DP12N*81	22DP12O*81	22DP12P*81	22DP12Q*81
3	5	35	1P	22EP12A*81	22EP12B*81	22EP12W*81	22EP12F*81	22EP12H*81	22EP12J*81	22EP12L*81	22EP12M*81	22EP12N*81	22EP12O*81	22EP12P*81	22EP12Q*81

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All Starter Sizes carry one maximum Hp rating.

- ① For conduit hubs and conversion instructions, see page 9/110.
 ② Coil D, F, or G will be wired for Incoming Voltage. J coil will be wired for 24V separate source. Coils E, H, and L do not apply to single phase starters.

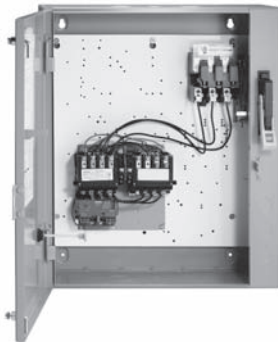
- ③ Auxiliary contacts
 22B-22E 4th pole built-in
 22F-22J 2 NO & 2 NC

Combination Reversing Heavy Duty Starters

Non-Fusible, Class 25

• Revised •
09/07/16

Selection

	Ordering Information	Coil Table	
	<ul style="list-style-type: none">► Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.► Heater elements see page 9/124.► Fuse clips see page 9/120.► Field Modification Kits see page 9/104.► Factory Modifications see page 9/119.► Dimensions see page 9/164.► Wiring Diagrams see page 9/177.► Replacement Parts see page 9/131.► For NO/NC SPDT contact on overload, replace "81" with "91". "81" indicates one NC contact.	60Hz Voltage	Letter
		24	J
		120	F
		110–120/220–240 ^①	A
		200–208	D
		220–240	G
		277	L
		220–240/440–480 ^①	C
		440–480	H
		575–600	E
		For other voltages and frequencies, see Factory Modifications page 9/119.	

Standard Width Enclosure with Solid State Overload, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless ^② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^③ , NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight			
											Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
¼	¼	¼	¼	0	—	0.25–1	A	30	25CUA92B*		25CUA92W*		25CUA92F*		25CUA92N*	
½	¾	1½	2	0	—	0.75–3.4	A	30	25CUB92B*		25CUB92W*		25CUB92F*		25CUB92N*	
2	2	5	5	0	—	3–12	A1	30	25CUC92B*		25CUC92W*		25CUC92F*		25CUC92N*	
3	3	—	—	0	—	5.5–22	A1	30	25CUD92B*		25CUD92W*		25CUD92F*		25CUD92N*	
¼	¼	¼	¼	1	—	0.25–1	A	30	25DUA92B*		25DUA92W*		25DUA92F*		25DUA92N*	
½	¾	1½	2	1	—	0.75–3.4	A	30	25DUB92B*		25DUB92W*		25DUB92F*		25DUB92N*	
2	2	5	5	1	—	3–12	A1	30	25DUC92B*		25DUC92W*		25DUC92F*		25DUC92N*	
3	3	10	10	1	—	5.5–22	A1	30	25DUD92B*		25DUD92W*		25DUD92F*		25DUD92N*	
7½	7½	—	—	1	—	10–40	A1	60	25DUE92B*		25DUE92W*		25DUE92F*		25DUE92N*	
10	10	15	15	—	1½	10–40	A1	60	25EUE92B*		25EUE92W*		25EUE92F*		25EUE92N*	
10	15	25	25	2	—	13–52	B	60	25FUF92B*		25FUF92W*		25FUF92F*		25FUF92N*	
15	20	30	30	—	2½	25–100	B	100	25GUG92B*		25GUG92W*		25GUG92F*		25GUG92N*	
20	25	50	50	3	—	25–100	B	100	25HUG92B*		25HUG92W*		25HUG92F*		25HUG92N*	
30	40	75	75	—	3¾	50–200	B	200	25IUH92B*		25IUH92W*		25IUH92F*		25IUH92N*	
40	50	100	100	4	—	50–200	B	200	25JUH92B*		25JUH92W*		25JUH92F*		25JUH92N*	
75	100	200	200	5	—	55–250	—	400	25LPU92B*		25LPU92E* ^③		—	—	25LPU92N*	
150	200	400	400	6	—	160–630	—	800	25MPX92B*		25MPX92E* ^③		—	—	25MPX92N*	
—	300	600	600	7 ^④	—	400–1220	A1+CT	1200	25NUN92B*		—	—	—	—	25NUN92N*	
—	450	900	900	8 ^④	—	400–1220	A1+CT	1600	25PUN92B*		—	—	—	—	25PUN92N*	

Standard Width Enclosure with Ambient Compensated Bimetal Overload, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless [®] Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 [®] NEMA 3/3R NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30	25CP92B*81		25CP92W*81		25CP92F*81		25CP92N*81	
7½	7½	10	10	1	—	30	25DP92B*81		25DP92W*81		25DP92F*81		25DP92N*81	
10	10	15	15	—	1¼	60	25EP92B*81		25EP92W*81		25EP92F*81		25EP92N*81	
10	15	25	25	2	—	60	25FP92B*81		25FP92W*81		25FP92F*81		25FP92N*81	
15	20	30	30	—	2½	100	25GP92B*81		25GP92W*81		25GP92F*81		25GP92N*81	
25	30	50	50	3	—	100	25HP92B*81		25HP92W*81		25HP92F*81		25HP92N*81	
30	40	75	75	—	3½	200	25IP92B*81		25IP92W*81		25IP92F*81		25IP92N*81	
40	50	100	100	4	—	200	25JP92B*81		25JP92W*81		25JP92F*81		25JP92N*81	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in starter sizes 5–8.

② For conduit hubs and conversion instructions, see page 9/110.

③ Enclosure is NEMA Type 4 (painted steel).

④ F coil 100–250V AC 50/60Hz, or DC, H coil 150–500V AC 50/60Hz, or DC

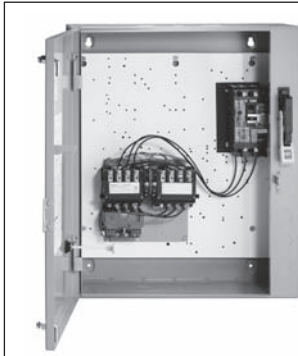
⑤ Only available F coil 100–250V AC 50/60Hz, or DC

• Revised •
09/07/16

Combination Reversing Heavy Duty Starters

MCP Type, Class 26

Selection



Ordering Information

- Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- Field Modification Kits see page 9/104.
- Factory Modifications see page 9/119.
- Dimensions see page 9/164.
- Wiring Diagrams see page 9/177.
- Replacement Parts see page 9/131.
- For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 ^①	A
200–208	D
220–240	G
277	L
220–240/440–480 ^①	C
440–480	H
575–600	E
For other voltages and frequencies, see Factory Modifications page 9/119.	

Standard Width Enclosure with Solid State Overload, 3-Phase, 3-Pole

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div. 1 and Div. 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12, NEMA 3/3R ^③ , NEMA 4 Painted (thru size 4) Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
½	½	1	1	0	—	3	0.75–3.4	A	26CUB92B*		26CUB92W*		26CUB92F*		26CUB92H*		26CUB92N*	
2	2	5	5	0	—	10	3–12	A1	26CUC92B*		26CUC92W*		26CUC92F*		26CUC92H*		26CUC92N*	
3	3	—	—	0	—	25	5.5–22	A1	26CUD92B*		26CUD92W*		26CUD92F*		26CUD92H*		26CUD92N*	
½	½	1	1	1	—	3	0.75–3.4	A	26DUB92B*		26DUB92W*		26DUB92F*		26DUB92H*		26DUB92N*	
2	2	5	5	1	—	10	3–12	A1	26DUC92B*		26DUC92W*		26DUC92F*		26DUC92H*		26DUC92N*	
3	3	7½	10	1	—	25	5.5–22	A1	26DUD92B*		26DUD92W*		26DUD92F*		26DUD92H*		26DUD92N*	
7½	7½	10	—	1	—	30	10–40	A1	26DUE92B*		26DUE92W*		26DUE92F*		26DUE92H*		26DUE92N*	
—	—	15	15	—	1½	40	10–40	A1	26EUE92B*		26EUE92W*		26EUE92F*		26EUE92H*		26EUE92N*	
10	15	25	25	2	—	50	13–52	B	26FUF92B*		26FUF92W*		26FUF92F*		26FUF92H*		26FUF92N*	
15	20	30	30	—	2½	100	25–100	B	26GUG92B*		26GUG92W*		26GUG92F*		26GUG92H*		26GUG92N*	
25	30	50	50	3	—	125	25–100	B	26HUG92B*		26HUG92W*		26HUG92F*		26HUG92H*		26HUG92N*	
30	40	75	75	—	3½	125	50–200	B	26IUH92B*		26IUH92W*		26IUH92F*		26IUH92H*		26IUH92N*	
40	50	100	100	4	—	150	50–200	B	26JUH92B*		26JUH92W*		26JUH92F*		26JUH92H*		26JUH92N*	
50	75	150	200	5	—	250	55–250	—	26LPT92B*		26LPT92E* ^③		—	—	—	—	26LPT92N*	
75	100	200	—	5	—	400	55–250	—	26LP92B*		26LP92E* ^③		—	—	—	—	26LP92N*	
100	125	250	300	6	—	400	160–630	—	26MPW92B*		26MPW92E* ^③		—	—	—	—	26MPW92N*	
150	200	400	400	6	—	600	160–630	—	26MPX92B*		26MPX92E* ^③		—	—	—	—	26MPX92N*	
—	250	500	500	7* ^④	—	800	400–1220	A1+CT	26NUV92B*		—	—	—	—	—	—	26NUV92N*	
—	300	600	600	7* ^④	—	1000	400–1220	A1+CT	26NUY92B*		—	—	—	—	—	—	26NUY92N*	
—	400	800	800	8 ^⑤	—	1200	400–1220	A1+CT	26PUW92B*		—	—	—	—	—	—	26PUW92N*	
—	450	900	900	8 ^⑤	—	1600	400–1220	A1+CT	26PUZ92B*		—	—	—	—	—	—	26PUZ92N*	

Standard Width Enclosure with Ambient Compensated Bimetal Overload, 3-Phase, 3-Pole

1/2	1/2	1	1	0	—	3			26CP92BA*81	26CP92WA*81	26CP92FA*81	26CP92HA*81	26CP92NA*81
1	1	3	3	0	—	10			26CP92BB*81	26CP92WB*81	26CP92FB*81	26CP92HB*81	26CP92NB*81
3	3	5	5	0	—	25			26CP92BC*81	26CP92WC*81	26CP92FC*81	26CP92HC*81	26CP92NC*81
1/2	1/2	1	1	1	—	3			26DP92BA*81	26DP92WA*81	26DP92FA*81	26DP92HA*81	26DP92NA*81
1	1	3	3	1	—	10			26DP92BB*81	26DP92WB*81	26DP92FB*81	26DP92HB*81	26DP92NB*81
3	3	7 1/2	7 1/2	1	—	25			26DP92BD*81	26DP92WD*81	26DP92FD*81	26DP92HD*81	26DP92ND*81
7 1/2	7 1/2	10	10	1	—	30			26DP92BE*81	26DP92WE*81	26DP92FE*81	26DP92HE*81	26DP92NE*81
—	—	15	15	—	1 1/4	40			26EP92BF*81	26EP92WF*81	26EP92FF*81	26EP92HF*81	26EP92NF*81
10	10	—	—	—	1 1/4	50			26EP92BG*81	26EP92WG*81	26EP92FG*81	26EP92HG*81	26EP92NG*81
—	—	20	20	2	—	40			26FP92BH*81	26FP92WH*81	26FP92FH*81	26FP92HH*81	26FP92NH*81
10	15	25	25	2	—	50			26FP92BJ*81	26FP92WJ*81	26FP92FJ*81	26FP92HJ*81	26FP92NJ*81
10	15	30	30	—	2 1/2	50			26GP92BK*81	26GP92WK*81	26GP92FK*81	26GP92HK*81	26GP92NK*81
15	20	—	—	—	2 1/2	100			26GP92BL*81	26GP92WL*81	26GP92FL*81	26GP92HL*81	26GP92NL*81
—	—	30	30	3	—	50			26HP92BM*81	26HP92WM*81	26HP92FM*81	26HP92HM*81	26HP92NM*81
25	30	50	50	3	—	125			26HP92BN*81	26HP92WN*81	26HP92FN*81	26HP92HN*81	26HP92NN*81
30	40	75	75	—	3 1/2	125			26IP92BP*81	26IP92WP*81	26IP92FP*81	26IP92HP*81	26IP92NP*81
40	50	100	100	4	—	150			26JP92BR*81	26JP92WR*81	26JP92FR*81	26JP92HR*81	26JP92NR*81

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in starter sizes 5–8.

② For conduit hubs and conversion instructions, see page 9/110.

③ Enclosure is NEMA Type 4 (painted steel).

④ F coil 100–250V AC 50/60Hz, or DC, H coil 150–500V AC 50/60Hz, or DC

⑤ Only available

F coil 100–250V AC 50/60Hz, or DC

Two Speed Heavy Duty Starters

Features and Benefits

General

Features

- Rugged Industrial Design
- Dual Voltage, Dual Frequency Coils
- Compact Design
- Snap-On Front Removable Auxiliary Contacts
- Electrical and Mechanical Interlocks
- Half Sizes — Space and Cost Savings
- Industrial Type Disconnect Operating Handle
- Visible Blade Disconnect Thru Size 4
- Adjustable Motor Circuit Protector
- 100,000 Amp Fault Protection with MCP or Class R Fuses
- Pilot Device Locations identified on All Enclosures
- UL Listed File #E14900
- CSA Certified File #LR6535

Applications

Multi-speed magnetic starters automatically reconnect multi-speed motor windings for the desired speed in response to a signal received from push button stations or other pilot devices.

These starters are available for two speed motors.

Consequent Pole multi-speed motors having two speeds on a single winding (consequent pole) require a starter which reconnects the motor leads to half the number of effective motor poles at the high speed point. In this type of motor, **the low speed is one half the high speed.**

Separate Windings motors having separate windings for each speed provide more varied speed combinations in that the low speed need not be one half the high speed.

Starters for separate winding motors consist of a starter unit for each speed.

Multi-speed motor starters are available for constant torque, variable torque and constant horsepower motors.

Constant Torque motors maintain constant torque at all speeds. Horsepower varies directly with speed. This type of motor is applicable to conveyors, mills and similar applications.

Variable Torque motors produce a torque characteristic which varies as the square of the speed. This type of

motor is applicable to fans, blowers and centrifugal pumps.

Constant Horsepower motors maintain constant horsepower at all speeds and therefore torque varies inversely with speed. This type of motor is applicable where the same horsepower is required at all speeds. **The higher current required at low speed requires derating on starters for constant horsepower applications.** This type of motor is applicable to metal working machines such as drills, lathes, mills, bending machines, punch presses, and power wrenches.

Operation

Magnetic starters for multi-speed applications select the desired speed in accordance with the pilot control.

The shock to machinery upon the reduction of speed is greater than when the speed is increased. Therefore, the pilot control should be wired so that the stop button must be depressed before dropping to a lower speed or time delays should be used for applications requiring full automatic operations. The multi-speed controls are available with the necessary interlocks or relays to provide this type of operation.

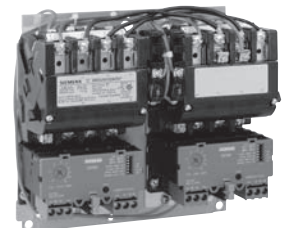
These controls may be modified for compelling or acceleration pilot control.

Selective Control permits the operator to start the motor at any speed and to change to a higher speed by merely pushing a button. To change to a lower speed it is necessary to first depress the stop button and to then press the proper speed button. Selective control is a function of the pilot control selected and requires no starter modifications.

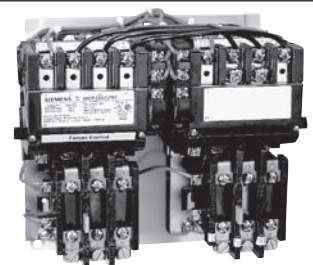
Compelling Control requires that the motor always be started at the lower speed and that the push buttons be operated in speed sequence to go to the next higher speed. To change to a lower speed, the stop button must be depressed and then the push buttons operated in speed sequence until the desired speed is reached. Compelling control can be added from the factory modification section page 9/122.

Acceleration Control provides that the motor be accelerated automatically with timers by progressively energizing the controls from the push button station from the lowest to highest speed. To change to a lower speed the stop button is depressed and then it is necessary to proceed as if starting from rest. Acceleration control can be added from the factory modification section page 9/122.

Deceleration Control provides that the motor be decelerated automatically with a timer when going from high speed to low speed. The timer allows the motor to decelerate from high speed to a lower speed before automatically restarting the motor in low speed. Deceleration control can be added from the factory modification section page 9/122.



Open Style Two Speed Starter
(ESP100 Overload)

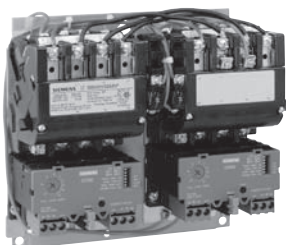


Open Style Two Speed Starter
(Ambient Compensated Overload)

Two Speed Heavy Duty Starters

Constant or Variable Torque with Solid Overload, Class 30

Selection



2S2W Starter
(ESP200 Overload)

Ordering Information	Coil Table	Low Speed FLA Table																																																								
<p>► Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.</p> <p>► Replace the (†) with the letter that corresponds to the correct low speed FLA in the FLA table.®</p> <p>► Field Modification Kits see page 9/104.</p> <p>► Factory Modifications see page 9/119.</p> <p>► Dimensions see page 9/150.</p> <p>► Wiring Diagrams see page 9/178.</p> <p>► Replacement Parts see page 9/131.</p>	<table><tr><th>60Hz Voltage</th><th>Letter</th></tr><tr><td>24</td><td>J</td></tr><tr><td>120</td><td>F</td></tr><tr><td>110–120/220–240</td><td>A</td></tr><tr><td>200–208</td><td>D</td></tr><tr><td>220–240</td><td>G</td></tr><tr><td>277</td><td>L</td></tr><tr><td>220–240/440–480</td><td>C</td></tr><tr><td>440–480</td><td>H</td></tr><tr><td>575–600</td><td>E</td></tr></table>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240	A	200–208	D	220–240	G	277	L	220–240/440–480	C	440–480	H	575–600	E	<table><tr><th>Size</th><th>FLA</th><th>OLR Frame Size</th><th>†</th></tr><tr><td>0,1</td><td>0.25–1</td><td>A</td><td>A</td></tr><tr><td>0,1</td><td>0.75–3.4</td><td>A</td><td>B</td></tr><tr><td>0,1</td><td>3–12</td><td>A1</td><td>C</td></tr><tr><td>0,1</td><td>5.5–22</td><td>A1</td><td>D</td></tr><tr><td>0-1³/₄</td><td>10–40</td><td>A1</td><td>E</td></tr><tr><td>2-3</td><td>13–52</td><td>B</td><td>F</td></tr><tr><td>2-3</td><td>25–100</td><td>B</td><td>G</td></tr><tr><td>3¹/₂-4</td><td>50–200</td><td>B</td><td>H</td></tr></table>	Size	FLA	OLR Frame Size	†	0,1	0.25–1	A	A	0,1	0.75–3.4	A	B	0,1	3–12	A1	C	0,1	5.5–22	A1	D	0-1 ³ / ₄	10–40	A1	E	2-3	13–52	B	F	2-3	25–100	B	G	3 ¹ / ₂ -4	50–200	B	H
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3 ¹ / ₂ -4	50–200	B	H																																																							
For other voltages and frequencies, see Factory Modifications page 9/119.																																																										

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload		Enclosure								
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size	Open Type Standard Auxiliary Contacts ^③		NEMA 1 General Purpose	NEMA 4/4X Stainless ^① Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12 NEMA 3/3R ^① Industrial Use Weatherproof (Field Convertible to 3/3R)			
								Catalog Number	List Price \$					Catalog Number	List Price \$	Catalog Number
½	¾	1½	2	0	—	0.75–3.4	A	30CUB†32A2V*		30CUB†32B2V*		30CUB†32W2V*		30CUB†32F2V*		30CUB†3202V*
2	2	5	5	0	—	3–12	A1	30CUC†32A2V*		30CUC†32B2V*		30CUC†32W2V*		30CUC†32F2V*		30CUC†3202V*
3	3	—	—	0	—	5.5–22	A1	30CUD†32A2V*		30CUD†32B2V*		30CUD†32W2V*		30CUD†32F2V*		30CUD†3202V*
½	¾	1½	1½	1	—	0.75–3.4	A	30DUB†32A2V*		30DUB†32B2V*		30DUB†32W2V*		30DUB†32F2V*		30DUB†3202V*
2	2	5	5	1	—	3–12	A1	30DUC†32A2V*		30DUC†32B2V*		30DUC†32W2V*		30DUC†32F2V*		30DUC†3202V*
3	3	10	10	1	—	5.5–22	A1	30DUD†32A2V*		30DUD†32B2V*		30DUD†32W2V*		30DUD†32F2V*		30DUD†3202V*
7½	7½	—	—	1	—	10–40	A1	30DUE†32A2V*		30DUE†32B2V*		30DUE†32W2V*		30DUE†32F2V*		30DUE†3202V*
10	10	15	15	—	1½	10–40	A1	30EUE†32A2V*		30EUE†32B2V*		30EUE†32W2V*		30EUE†32F2V*		30EUE†3202V*
10	15	25	25	2	—	13–52	B	30FUF†32A2V*		30FUF†32B2V*		30FUF†32W2V*		30FUF†32F2V*		30FUF†3202V*
15	20	30	30	—	2½	25–100	B	30GUG†32A2V*		30GUG†32B2V*		30GUG†32W2V*		30GUG†32F2V*		30GUG†3202V*
25	30	50	50	3	—	25–100	B	30HUG†32A2V*		30HUG†32B2V*		30HUG†32W2V*		30HUG†32F2V*		30HUG†3202V*
30	40	75	75	—	3½	50–200	B	30IUH†32A2V*		30IUH†32B2V*		30IUH†32W2V*		30IUH†32F2V*		30IUH†3202V*
40	50	100	100	4	—	50–200	B	30JUH†32A2V*		30JUH†32B2V*		30JUH†32W2V*		30JUH†32F2V*		30JUH†3202V*

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload		Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size	Open Type [®] Standard Auxiliary Contacts		NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel 316 Stainless Steel (Optional)		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R ^① Industrial Use Weatherproof (Field Convertible to 3/3R)	
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
½	¾	1½	2	0	—	0.75–3.4	A	30CUB†32A1V*		30CUB†32B1V*		30CUB†32W1V*		30CUB†32F1V*		30CUB†3201V*	
2	2	5	5	0	—	3–12	A1	30CUC†32A1V*		30CUC†32B1V*		30CUC†32W1V*		30CUC†32F1V*		30CUC†3201V*	
3	3	—	—	0	—	5.5–22	A1	30CUD†32A1V*		30CUD†32B1V*		30CUD†32W1V*		30CUD†32F1V*		30CUD†3201V*	
½	¾	1½	1½	1	—	0.75–3.4	A	30DUB†32A1V*		30DUB†32B1V*		30DUB†32W1V*		30DUB†32F1V*		30DUB†3201V*	
2	2	5	5	1	—	3–12	A1	30DUC†32A1V*		30DUC†32B1V*		30DUC†32W1V*		30DUC†32F1V*		30DUC†3201V*	
3	3	10	10	1	—	5.5–22	A1	30DUD†32A1V*		30DUD†32B1V*		30DUD†32W1V*		30DUD†32F1V*		30DUD†3201V*	
7½	7½	—	—	1	—	10–40	A1	30DUE†32A1V*		30DUE†32B1V*		30DUE†32W1V*		30DUE†32F1V*		30DUE†3201V*	
10	10	15	15	—	1½	10–40	A1	30EUE†32A1V*		30EUE†32B1V*		30EUE†32W1V*		30EUE†32F1V*		30EUE†3201V*	
10	15	25	25	2	—	13–52	B	30FUF†32A1V*		30FUF†32B1V*		30FUF†32W1V*		30FUF†32F1V*		30FUF†3201V*	
15	20	30	30	—	2½	25–100	B	30GUG†32A1V*		30GUG†32B1V*		30GUG†32W1V*		30GUG†32F1V*		30GUG†3201V*	
25	30	50	50	3	—	25–100	B	30HUG†32A1V*		30HUG†32B1V*		30HUG†32W1V*		30HUG†32F1V*		30HUG†3201V*	
30	40	75	75	—	3½	50–200	B	30IUH†32A1V*		30IUH†32B1V*		30IUH†32W1V*		30IUH†32F1V*		30IUH†3201V*	
40	50	100	100	4	—	50–200	B	30JUH†32A1V*		30JUH†32B1V*		30JUH†32W1V*		30JUH†32F1V*		30JUH†3201V*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

® For conduit hubs and conversion instructions, see page 9/110.

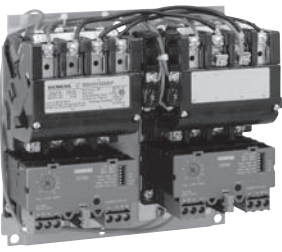
® If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

® Auxiliary contacts 30C-30E 4th pole built-in 30F-30J 2 NO & 2 NC

Two Speed Heavy Duty Starters

Constant HP with Solid Overload, Class 30

Selection

 <p>2S2W Starter (ESP200 Overload)</p>	Ordering Information		Coil Table		High/Low Speed FLA Table [®]				
	<ul style="list-style-type: none"> ► Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ► Replace the (†) with the letter that corresponds to the correct FLA in High/Low Speed FLA Table.[®] ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/150. ► Wiring Diagrams see page 9/178. ► Replacement Parts see page 9/131. 		60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†	
			24	J	0,1	0.25–1	A	A	
			120	F	0,1	0.75–3.4	A	B	
			110–120/220–240	A	0,1	3–12	A1	C	
			200–208	D	0,1	5.5–22	A1	D	
			220–240	G	0-1 ³ / ₄	10–40	A1	E	
			277	L	2-3	13–52	B	F	
			220–240/440–480	C	2-3	25–100	B	G	
			440–480	H	3 ¹ / ₂ -4	50–200	B	H	
			575–600	E					
			For other voltages and frequencies, see Factory Modifications page 9/119.		* First (†) for high speed, second (†) for low speed. Use motor nameplate to select FLA. If motor FLA are unknown, select overload on the bases that the low speed FLA will be no greater than 50 % of high speed FLA.				

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp						Enclosure									
						Open Type Standard Auxiliary Contacts ^③		NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R ^① Industrial Use Weatherproof (Field Convertible to 3/3R)	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	30CU††32A2H*		30CU††32B2H*		30CU††32W2H*		30CU††32F2H*		30CU††32O2H*	
5	5	7½	7½	1	—	30DU††32A2H*		30DU††32B2H*		30DU††32W2H*		30DU††32F2H*		30DU††32O2H*	
7½	7½	10	10	—	1½	30EU††32A2H*		30EU††32B2H*		30EU††32W2H*		30EU††32F2H*		30EU††32O2H*	
7½	10	20	20	2	—	30FU††32A2H*		30FU††32B2H*		30FU††32W2H*		30FU††32F2H*		30FU††32O2H*	
10	15	25	25	—	2½	30GU††32A2H*		30GU††32B2H*		30GU††32W2H*		30GU††32F2H*		30GU††32O2H*	
20	25	40	40	3	—	30HU††32A2H*		30HU††32B2H*		30HU††32W2H*		30HU††32F2H*		30HU††32O2H*	
25	30	50	50	—	3½	30IU††32A2H*		30IU††32B2H*		30IU††32W2H*		30IU††32F2H*		30IU††32O2H*	
30	40	75	75	4	—	30JU††32A2H*		30JU††32B2H*		30JU††32W2H*		30JU††32F2H*		30JU††32O2H*	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp						Enclosure									
						Open Type Standard Auxiliary Contacts ^③		NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 NEMA 3/3R ^① Industrial Use Weatherproof (Field Convertible to 3/3R)	
200 Volts	230 Volts	460 Volts	575 Volts	NEMA Size	Half Size	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	30CU††32A1H*		30CU††32B1H*		30CU††32W1H*		30CU††32F1H*		30CU††32O1H*	
5	5	7½	7½	1	—	30DU††32A1H*		30DU††32B1H*		30DU††32W1H*		30DU††32F1H*		30DU††32O1H*	
7½	7½	10	10	—	1¾	30EU††32A1H*		30EU††32B1H*		30EU††32W1H*		30EU††32F1H*		30EU††32O1H*	
7½	10	20	20	2	—	30FU††32A1H*		30FU††32B1H*		30FU††32W1H*		30FU††32F1H*		30FU††32O1H*	
10	15	25	25	—	2½	30GU††32A1H*		30GU††32B1H*		30GU††32W1H*		30GU††32F1H*		30GU††32O1H*	
20	25	40	40	3	—	30HU††32A1H*		30HU††32B1H*		30HU††32W1H*		30HU††32F1H*		30HU††32O1H*	
25	30	50	50	—	3½	30IU††32A1H*		30IU††32B1H*		30IU††32W1H*		30IU††32F1H*		30IU††32O1H*	
30	40	75	75	4	—	30JU††32A1H*		30JU††32B1H*		30JU††32W1H*		30JU††32F1H*		30JU††32O1H*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① For conduit hubs and conversion instructions, see page 9/110.

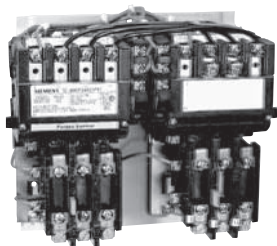
② First (†) for high speed, second (†) for low speed. Use motor nameplate information to select FLA. If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

③ Auxiliary contacts
30C-30E 4th pole built-in
30F-30J 2 NO & 2 NC

Two Speed Heavy Duty Starters

Constant or Variable Torque with Ambient Compensated Bimetal Overload, Class 30

Selection



2S2W starter
(Amb. Comp. Bimetal OL)

Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 9/124 (6 required)^②
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see pages 9/143 open and 9/150 enclosed.
- ▶ Wiring Diagrams see page 9/178.
- ▶ Replacement Parts see page 9/131.
- ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage
Letter

24	J
120	F
110–120/220–240	A
200–208	D
220–240	G
277	L
220–240/440–480	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

One Winding Consequent Pole, 3 Phase (Constant or Variable Torque)

One-Winding Consequent Pole 3-Phase (Constant or Variable Torque)																
Max Hp				Con- tactor Amp Rating	NEMA Size	Half Size	Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts				Open Type ^③		NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 ^① NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$
3	3	5	5	18	0	—	30CP32A2V*81		30CP32B2V*81		30CP32W2V*81		30CP32F2V*81		30CP32O2V*81	
7½	7½	10	10	27	1	—	30DP32A2V*81		30DP32B2V*81		30DP32W2V*81		30DP32F2V*81		30DP32O2V*81	
10	10	15	15	40	—	1¾	30EP32A2V*81		30EP32B2V*81		30EP32W2V*81		30EP32F2V*81		30EP32O2V*81	
10	15	25	25	45	2	—	30FP32A2V*81		30FP32B2V*81		30FP32W2V*81		30FP32F2V*81		30FP32O2V*81	
15	20	30	30	60	—	2½	30GP32A2V*81		30GP32B2V*81		30GP32W2V*81		30GP32F2V*81		30GP32O2V*81	
25	30	50	50	90	3	—	30HP32A2V*81		30HP32B2V*81		30HP32W2V*81		30HP32F2V*81		30HP32O2V*81	
30	40	75	75	115	—	3½	30IP32A2V*81		30IP32B2V*81		30IP32W2V*81		30IP32F2V*81		30IP32O2V*81	
40	50	100	100	135	4	—	30JG32A2V*81		30JG32B2V*81		30JG32W2V*81		30JG32F2V*81		30JG32O2V*81	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				Con- tactor Amp Rating	NEMA Size	Half Size	Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts				Open Type ^③		NEMA 1 General Purpose		NEMA 4/4X Stainless ^① Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12 ^① NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$
3	3	5	5	18	0	—	30CP32A1V*81		30CP32B1V*81		30CP32W1V*81		30CP32F1V*81		30CP32O1V*81	
7½	7½	10	10	27	1	—	30DP32A1V*81		30DP32B1V*81		30DP32W1V*81		30DP32F1V*81		30DP32O1V*81	
10	10	15	15	40	—	1¾	30EP32A1V*81		30EP32B1V*81		30EP32W1V*81		30EP32F1V*81		30EP32O1V*81	
10	15	25	25	45	2	—	30FP32A1V*81		30FP32B1V*81		30FP32W1V*81		30FP32F1V*81		30FP32O1V*81	
15	20	30	30	60	—	2½	30GP32A1V*81		30GP32B1V*81		30GP32W1V*81		30GP32F1V*81		30GP32O1V*81	
25	30	50	50	90	3	—	30HP32A1V*81		30HP32B1V*81		30HP32W1V*81		30HP32F1V*81		30HP32O1V*81	
30	40	75	75	115	—	3½	30IP32A1V*81		30IP32B1V*81		30IP32W1V*81		30IP32F1V*81		30IP32O1V*81	
40	50	100	100	135	4	—	30JG32A1V*81		30JG32B1V*81		30JG32W1V*81		30JG32F1V*81		30JG32O1V*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① For conduit hubs and conversion instructions, see page 9/110.

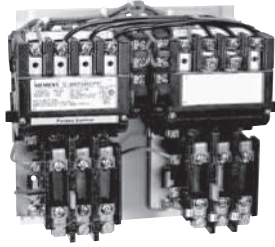
② If motor FLA are unknown, select heater elements on the basis that low speed FLA will be no greater than 50% of high speed FLA.

③ Auxiliary contacts
30C-30E 4th pole built-in
30F-30J 2 NO & 2 NC

Two Speed Heavy Duty Starters

Constant HP with Ambient Compensated Bimetal Overload, Class 30

Selection



2S2W starter
(Amb. Comp. Bimetal OL)

Ordering Information

- Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- Heater elements see page 9/124 (6 required)②
- Field Modification Kits see page 9/104.
- Factory Modifications see page 9/119.
- Dimensions see pages 9/143 open and 9/150 enclosed.
- Wiring Diagrams see page 9/178.
- Replacement Parts see page 9/131.
- For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A
200–208	D
220–240	G
277	L
220–240/440–480	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp				Contact- actor Amp Rating	NEMA Size	Half Size	Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts				Open Type®		NEMA 1 General Purpose		NEMA 4/4X Stainless® Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12® NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	18	0	—	30CP32A2H*81		30CP32B2H*81		30CP32W2H*81		30CP32F2H*81		30CP3202H*81	
5	5	7½	7½	27	1	—	30DP32A2H*81		30DP32B2H*81		30DP32W2H*81		30DP32F2H*81		30DP3202H*81	
7½	7½	10	10	40	—	1¾	30EP32A2H*81		30EP32B2H*81		30EP32W2H*81		30EP32F2H*81		30EP3202H*81	
7½	10	20	20	45	2	—	30FP32A2H*81		30FP32B2H*81		30FP32W2H*81		30FP32F2H*81		30FP3202H*81	
10	15	25	25	60	—	2½	30GP32A2H*81		30GP32B2H*81		30GP32W2H*81		30GP32F2H*81		30GP3202H*81	
20	25	40	40	90	3	—	30HP32A2H*81		30HP32B2H*81		30HP32W2H*81		30HP32F2H*81		30HP3202H*81	
25	30	50	50	115	—	3½	30IP32A2H*81		30IP32B2H*81		30IP32W2H*81		30IP32F2H*81		30IP3202H*81	
30	40	75	75	135	4	—	30JG32A2H*81		30JG32B2H*81		30JG32W2H*81		30JG32F2H*81		30JG3202H*81	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp				Contact- Amp Rating	NEMA Size	Half Size	Enclosure									
200 Volts	230 Volts	460 Volts	575 Volts				Open Type®		NEMA 1 General Purpose		NEMA 4/4X Stainless® Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12® NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$
2	2	3	3	18	0	—	30CP32A1H*81		30CP32B1H*81		30CP32W1H*81		30CP32F1H*81		30CP3201H*81	
5	5	7½	7½	27	1	—	30DP32A1H*81		30DP32B1H*81		30DP32W1H*81		30DP32F1H*81		30DP3201H*81	
7½	7½	10	10	40	—	1¾	30EP32A1H*81		30EP32B1H*81		30EP32W1H*81		30EP32F1H*81		30EP3201H*81	
7½	10	20	20	45	2	—	30FP32A1H*81		30FP32B1H*81		30FP32W1H*81		30FP32F1H*81		30FP3201H*81	
10	15	25	25	60	—	2½	30GP32A1H*81		30GP32B1H*81		30GP32W1H*81		30GP32F1H*81		30GP3201H*81	
20	25	40	40	90	3	—	30HP32A1H*81		30HP32B1H*81		30HP32W1H*81		30HP32F1H*81		30HP3201H*81	
25	30	50	50	115	—	3½	30IP32A1H*81		30IP32B1H*81		30IP32W1H*81		30IP32F1H*81		30IP3201H*81	
30	40	75	75	135	4	—	30JG32A1H*81		30JG32B1H*81		30JG32W1H*81		30JG32F1H*81		30JG3201H*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① For conduit hubs and conversion instructions, see page 9/110.

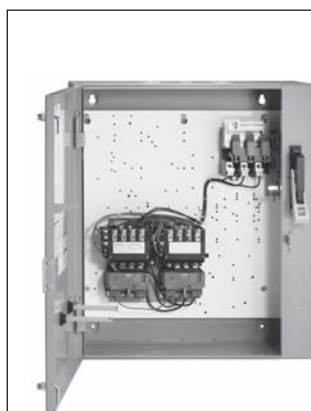
② If motor FLA are unknown, select heater element on the basis that low speed FLA will be no greater than 50% of high speed FLA.

③ Auxiliary contacts
30C-30E 4th pole built-in
30F-30J 2 NO & 2 NC

Combination Two Speed Heavy Duty Starters

Non-Fusible, Constant or Variable Torque with Solid Overload, Class 32

Selection



Ordering Information

- Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- Replace the (†) with the letter that corresponds to the correct low speed FLA in the FLA table.®
- Fuse clips see page 9/120.
- Field Modification Kits see page 9/104.
- Factory Modifications see page 9/119.
- Dimensions see page 9/166.
- Wiring Diagrams see page 9/178.
- Replacement Parts see page 9/131.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 ^①	A
200–208	D
220–240	G
277	L
220–240/440–480 ^①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

Low Speed FLA Table

Size	FLA	OLR Frame Size	†
0,1	0.25–1	A	A
0,1	0.75–3.4	A	B
0,1	3–12	A1	C
0,1	5.5–22	A1	D
0-1 ³ / ₄	10–40	A1	E
2-3	13–52	B	F
2-3	25–100	B	G
3 ¹ / ₂ -4	50–200	B	H

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless® Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R®, NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight				
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$			
1/2	1/2	1 1/2	2	0	—	0.75–3.4	A	30	32CUB†92B2V2*		32CUB†92W2V2*		32CUB†92F2V2*		32CUB†92N2V2*	
2	2	5	5	0	—	3–12	A1	30	32CUC†92B2V2*		32CUC†92W2V2*		32CUC†92F2V2*		32CUC†92N2V2*	
3	3	—	—	0	—	5.5–22	A1	30	32CUD†92B2V2*		32CUD†92W2V2*		32CUD†92F2V2*		32CUD†92N2V2*	
1/2	1/2	1 1/2	1 1/2	1	—	0.75–3.4	A	30	32DUB†92B2V2*		32DUB†92W2V2*		32DUB†92F2V2*		32DUB†92N2V2*	
2	2	5	5	1	—	3–12	A1	30	32DUC†92B2V2*		32DUC†92W2V2*		32DUC†92F2V2*		32DUC†92N2V2*	
3	3	10	10	1	—	5.5–22	A1	30	32DUD†92B2V2*		32DUD†92W2V2*		32DUD†92F2V2*		32DUD†92N2V2*	
7 1/2	7 1/2	—	—	1	—	10–40	A1	60	32DUE†92B2V2*		32DUE†92W2V2*		32DUE†92F2V2*		32DUE†92N2V2*	
10	10	15	15	—	1 1/2	10–40	A1	60	32EUE†92B2V2*		32EUE†92W2V2*		32EUE†92F2V2*		32EUE†92N2V2*	
10	15	25	25	2	—	13–52	B	60	32FUF†92B2V2*		32FUF†92W2V2*		32FUF†92F2V2*		32FUF†92N2V2*	
15	20	30	30	—	2 1/2	25–100	B	100	32GUG†92B2V2*		32GUG†92W2V2*		32GUG†92F2V2*		32GUG†92N2V2*	
20	25	50	50	3	—	25–100	B	100	32HUG†92B2V2*		32HUG†92W2V2*		32HUG†92F2V2*		32HUG†92N2V2*	
30	40	75	75	—	3 1/2	50–200	B	200	32IUH†92B2V2*		32IUH†92W2V2*		32IUH†92F2V2*		32IUH†92N2V2*	
40	50	100	100	4	—	50–200	R	200	32JIH†92B2V2*		32JIH†92W2V2*		32JIH†92F2V2*		32JIH†92N2V2*	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless [®] Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R [®] , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight		
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
½	¾	1½	2	0	—	0.75–3.4	A	30	32CUB†92B1V2*		32CUB†92W1V2*		32CUB†92F1V2*		32CUB†92N1V2*	
2	2	5	5	0	—	3–12	A1	30	32CUC†92B1V2*		32CUC†92W1V2*		32CUC†92F1V2*		32CUC†92N1V2*	
3	3	—	—	0	—	5.5–22	A1	30	32CUD†92B1V2*		32CUD†92W1V2*		32CUD†92F1V2*		32CUD†92N1V2*	
½	¾	1½	1½	1	—	0.75–3.4	A	30	32DUB†92B1V2*		32DUB†92W1V2*		32DUB†92F1V2*		32DUB†92N1V2*	
2	2	5	5	1	—	3–12	A1	30	32DUC†92B1V2*		32DUC†92W1V2*		32DUC†92F1V2*		32DUC†92N1V2*	
3	3	10	10	1	—	5.5–22	A1	30	32DUD†92B1V2*		32DUD†92W1V2*		32DUD†92F1V2*		32DUD†92N1V2*	
7½	7½	—	—	1	—	10–40	A1	60	32DUE†92B1V2*		32DUE†92W1V2*		32DUE†92F1V2*		32DUE†92N1V2*	
10	10	15	15	—	1½	10–40	A1	60	32EUE†92B1V2*		32EUE†92W1V2*		32EUE†92F1V2*		32EUE†92N1V2*	
10	15	25	25	2	—	13–52	B	60	32FUF†92B1V2*		32FUF†92W1V2*		32FUF†92F1V2*		32FUF†92N1V2*	
15	20	30	30	—	2½	25–100	B	100	32GUG†92B1V2*		32GUG†92W1V2*		32GUG†92F1V2*		32GUG†92N1V2*	
20	25	50	50	3	—	25–100	B	100	32HUG†92B1V2*		32HUG†92W1V2*		32HUG†92F1V2*		32HUG†92N1V2*	
30	40	75	75	—	3½	50–200	B	200	32IUH†92B1V2*		32IUH†92W1V2*		32IUH†92F1V2*		32IUH†92N1V2*	
40	50	100	100	4	—	50–200	B	200	32JUH†92B1V2*		32JUH†92W1V2*		32JUH†92F1V2*		32JUH†92N1V2*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in modified starters.

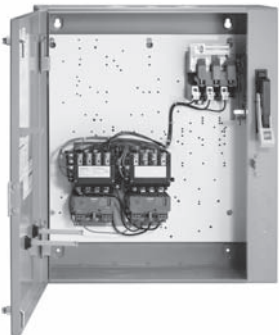
② For conduit hubs and conversion instructions, see page 9/110.

③ If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Combination Two Speed Heavy Duty Starters

Non-Fusible, Constant Horsepower with Solid State Overload, Class 32

Selection

	Ordering Information				Coil Table		High/Low Speed FLA Table [®]				
					60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†	
	<ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Replace the (†) with the letter that corresponds to the correct FLA in the High/Low Speed FLA Table.[®] ▶ Fuse clips see page 9/120. ▶ Field Modification Kits see page 9/104. ▶ Factory Modifications see page 9/119. ▶ Dimensions see page 9/166. ▶ Wiring Diagrams see page 9/178. ▶ Replacement Parts see page 9/131. 				24	J	0,1	0.25–1	A	A	
					120	F	0,1	0.75–3.4	A	B	
					110–120/220–240 ^①	A	0,1	3–12	A1	C	
					200–208	D	0,1	5.5–22	A1	D	
					220–240	G	0-1 ³ / ₄	10–40	A1	E	
					277	L	2-3	13–52	B	F	
					220–240/440–480 ^①	C	2-3	25–100	B	G	
					440–480	H	3 ¹ / ₂ -4	50–200	B	H	
					575–600	E					
					For other voltages and frequencies see Factory Modifications page 9/119.		* First (†) for high speed, second (†) for low speed. Use motor nameplate to select FLA. If motor FLA are unknown, select overload on the bases that the low speed FLA will be no greater than 50 % of high speed FLA.				

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless [®] Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R [®] , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	—	—	30	32CU††92B2H2*	32CU††92W2H2*	4054.00	32CU††92F2H2*	32CU††92N2H2*		32CU††92N2H2*	
5	5	7 ¹ / ₂	7 ¹ / ₂	1	—	—	—	30	32DU††92B2H2*	32DU††92W2H2*	4173.00	32DU††92F2H2*	32DU††92N2H2*		32DU††92N2H2*	
7 ¹ / ₂	7 ¹ / ₂	10	10	—	1 ¹ / ₂	—	—	60	32EU††92B2H2*	32EU††92W2H2*	4873.00	32EU††92F2H2*	32EU††92N2H2*		32EU††92N2H2*	
7 ¹ / ₂	10	20	20	2	—	—	—	60	32FU††92B2H2*	32FU††92W2H2*	6146.00	32FU††92F2H2*	32FU††92N2H2*		32FU††92N2H2*	
10	15	25	25	—	2 ¹ / ₂	—	—	100	32GU††92B2H2*	32GU††92W2H2*	7219.00	32GU††92F2H2*	32GU††92N2H2*		32GU††92N2H2*	
20	25	40	40	3	—	—	—	100	32HU††92B2H2*	32HU††92W2H2*	9321.00	32HU††92F2H2*	32HU††92N2H2*		32HU††92N2H2*	
25	30	50	50	—	3 ¹ / ₂	—	—	200	32IU††92B2H2*	32IU††92W2H2*	18079.00	32IU††92F2H2*	32IU††92N2H2*		32IU††92N2H2*	
30	40	75	75	4	—	—	—	200	32JU††92B2H2*	32JU††92W2H2*	19263.00	32JU††92F2H2*	32JU††92N2H2*		32JU††92N2H2*	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless [®] Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel	NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant	NEMA 12, NEMA 3/3R [®] , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	—	—	30	32CU††92B1H2*	32CU††92W1H2*		32CU††92F1H2*	32CU††92N1H2*		32CU††92N1H2*	
5	5	7 ¹ / ₂	7 ¹ / ₂	1	—	—	—	30	32DU††92B1H2*	32DU††92W1H2*		32DU††92F1H2*	32DU††92N1H2*		32DU††92N1H2*	
7 ¹ / ₂	7 ¹ / ₂	10	10	—	1 ¹ / ₂	—	—	60	32EU††92B1H2*	32EU††92W1H2*		32EU††92F1H2*	32EU††92N1H2*		32EU††92N1H2*	
7 ¹ / ₂	10	20	20	2	—	—	—	60	32FU††92B1H2*	32FU††92W1H2*		32FU††92F1H2*	32FU††92N1H2*		32FU††92N1H2*	
10	15	25	25	—	2 ¹ / ₂	—	—	100	32GU††92B1H2*	32GU††92W1H2*		32GU††92F1H2*	32GU††92N1H2*		32GU††92N1H2*	
20	25	40	40	3	—	—	—	100	32HU††92B1H2*	32HU††92W1H2*		32HU††92F1H2*	32HU††92N1H2*		32HU††92N1H2*	
25	30	50	50	—	3 ¹ / ₂	—	—	200	32IU††92B1H2*	32IU††92W1H2*		32IU††92F1H2*	32IU††92N1H2*		32IU††92N1H2*	
30	40	75	75	4	—	—	—	200	32JU††92B1H2*	32JU††92W1H2*		32JU††92F1H2*	32JU††92N1H2*		32JU††92N1H2*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in modified starters.

② For conduit hubs and conversion instructions, see page 9/110.

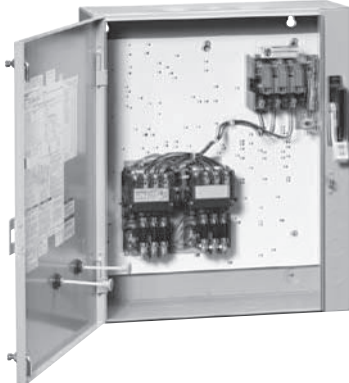
③ First † for high speed, second † for low speed. Use motor nameplate information to select FLA. If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Combination Two Speed Heavy Duty Starters

Non-Fusible, Constant or Variable Torque with Ambient Compensated Bimetal Overload, Class 32

• Revised •
09/07/16

Selection

	Ordering Information	Coil Table																				
	<ul style="list-style-type: none">▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.▶ Heater elements see page 9/124. (6 required)▶ Fuse clips see page 9/120.▶ Field Modification Kits see page 9/104.▶ Factory Modifications see page 9/119.▶ Dimensions see page 9/166.▶ Wiring Diagrams see page 9/178.▶ Replacement Parts see page 9/131.▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact.	<table><tr><th>60Hz Voltage</th><th>Letter</th></tr><tr><td>24</td><td>J</td></tr><tr><td>120</td><td>F</td></tr><tr><td>110–120/220–240^①</td><td>A</td></tr><tr><td>200–208</td><td>D</td></tr><tr><td>220–240</td><td>G</td></tr><tr><td>277</td><td>L</td></tr><tr><td>220–240/440–480^①</td><td>C</td></tr><tr><td>440–480</td><td>H</td></tr><tr><td>575–600</td><td>E</td></tr></table> <p>For other voltages and frequencies, see Factory Modifications page 9/119.</p>	60Hz Voltage	Letter	24	J	120	F	110–120/220–240 ^①	A	200–208	D	220–240	G	277	L	220–240/440–480 ^①	C	440–480	H	575–600	E
	60Hz Voltage	Letter																				
24	J																					
120	F																					
110–120/220–240 ^①	A																					
200–208	D																					
220–240	G																					
277	L																					
220–240/440–480 ^①	C																					
440–480	H																					
575–600	E																					

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Disc Half Size	Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	Catalog Number	Catalog Number	Catalog Number				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30	32CP92B2V2*81		32CP92W2V2*81		32CP92F2V2*81		32CP92N2V2*81	
7½	7½	10	10	1	—	30	32DP92B2V2*81		32DP92W2V2*81		32DP92F2V2*81		32DP92N2V2*81	
10	10	15	15	—	1¼	60	32EP92B2V2*81		32EP92W2V2*81		32EP92F2V2*81		32EP92N2V2*81	
10	15	25	25	2	—	60	32FP92B2V2*81		32FP92W2V2*81		32FP92F2V2*81		32FP92N2V2*81	
15	20	30	30	—	2½	100	32GP92B2V2*81		32GP92W2V2*81		32GP92F2V2*81		32GP92N2V2*81	
20	25	50	50	3	—	100	32HP92B2V2*81		32HP92W2V2*81		32HP92F2V2*81		32HP92N2V2*81	
30	40	75	75	—	3½	200	32IP92B2V2*81		32IP92W2V2*81		32IP92F2V2*81		32IP92N2V2*81	
40	50	100	100	4	—	200	32JP92B2V2*81		32JP92W2V2*81		32JP92F2V2*81		32JP92N2V2*81	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Disc Half Size	Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	Catalog Number	Catalog Number	Catalog Number				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30	32CP92B1V2*81		32CP92W1V2*81		32CP92F1V2*81		32CP92N1V2*81	
7½	7½	10	10	1	—	30	32DP92B1V2*81		32DP92W1V2*81		32DP92F1V2*81		32DP92N1V2*81	
10	10	15	15	—	1¼	60	32EP92B1V2*81		32EP92W1V2*81		32EP92F1V2*81		32EP92N1V2*81	
10	15	25	25	2	—	60	32FP92B1V2*81		32FP92W1V2*81		32FP92F1V2*81		32FP92N1V2*81	
15	20	30	30	—	2½	100	32GP92B1V2*81		32GP92W1V2*81		32GP92F1V2*81		32GP92N1V2*81	
20	25	50	50	3	—	100	32HP92B1V2*81		32HP92W1V2*81		32HP92F1V2*81		32HP92N1V2*81	
30	40	75	75	—	3½	200	32IP92B1V2*81		32IP92W1V2*81		32IP92F1V2*81		32IP92N1V2*81	
40	50	100	100	4	—	200	32JP92B1V2*81		32JP92W1V2*81		32JP92F1V2*81		32JP92N1V2*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

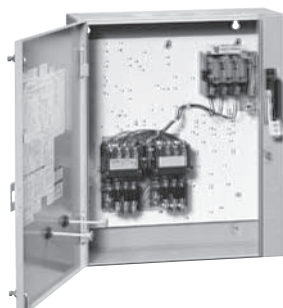
① Dual voltage coils not available in modified starters.
② For conduit hubs and conversion instructions, see page 9/110.

Combination Two Speed Heavy Duty Starters

Non-Fusible, Constant Horsepower with Ambient Compensated Bimetal Overload, Class 32

Selection

• Revised •
09/07/16



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Heater elements see page 9/124. (6 Required)
- ▶ Fuse clips see page 9/120.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see page 9/166.
- ▶ Wiring Diagrams see page 9/178.
- ▶ Replacement Parts see page 9/131.
- ▶ For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact..

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 ^①	A
200–208	D
220–240	G
277	L
220–240/440–480 ^①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Disc Half Size	Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	Catalog Number	Catalog Number	Catalog Number				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	30	32CP92B2H2*81		32CP92W2H2*81		32CP92F2H2*81		32CP92N2H2*81	
5	5	7½	7½	1	—	30	32DP92B2H2*81		32DP92W2H2*81		32DP92F2H2*81		32DP92N2H2*81	
7½	7½	10	10	—	1½	60	32EP92B2H2*81		32EP92W2H2*81		32EP92F2H2*81		32EP92N2H2*81	
7½	10	20	20	2	—	60	32FP92B2H2*81		32FP92W2H2*81		32FP92F2H2*81		32FP92N2H2*81	
10	15	25	25	—	2½	100	32GP92B2H2*81		32GP92W2H2*81		32GP92F2H2*81		32GP92N2H2*81	
20	25	40	40	3	—	100	32HP92B2H2*81		32HP92W2H2*81		32HP92F2H2*81		32HP92N2H2*81	
25	30	50	50	—	3½	200	32IP92B2H2*81		32IP92W2H2*81		32IP92F2H2*81		32IP92N2H2*81	
30	40	75	75	4	—	200	32JP92B2H2*81		32JP92W2H2*81		32JP92F2H2*81		32JP92N2H2*81	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
Catalog Number	Catalog Number	Catalog Number	Catalog Number				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	30	32CP92B1H2*81		32CP92W1H2*81		32CP92F1H2*81		32CP92N1H2*81	
5	5	7½	7½	1	—	30	32DP92B1H2*81		32DP92W1H2*81		32DP92F1H2*81		32DP92N1H2*81	
7½	7½	10	10	—	1½	60	32EP92B1H2*81		32EP92W1H2*81		32EP92F1H2*81		32EP92N1H2*81	
7½	10	20	20	2	—	60	32FP92B1H2*81		32FP92W1H2*81		32FP92F1H2*81		32FP92N1H2*81	
10	15	25	25	—	2½	100	32GP92B1H2*81		32GP92W1H2*81		32GP92F1H2*81		32GP92N1H2*81	
20	25	40	40	3	—	100	32HP92B1H2*81		32HP92W1H2*81		32HP92F1H2*81		32HP92N1H2*81	
25	30	50	50	—	3½	200	32IP92B1H2*81		32IP92W1H2*81		32IP92F1H2*81		32IP92N1H2*81	
30	40	75	75	4	—	200	32JP92B1H2*81		32JP92W1H2*81		32JP92F1H2*81		32JP92N1H2*81	

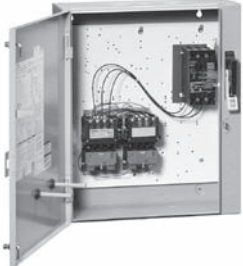
Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

- ① Dual voltage coils not available in modified starters.
② For conduit hubs and conversion instructions, see page 9/110.

Combination Two Speed Heavy Duty Starters

MCP Type, Constant or Variable Torque with Solid State Overload, Class 32

Selection

	Ordering Information		Coil Table		Low Speed FLA Table			
			60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†
	<ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. ▶ Replace the (†) with the letter that corresponds to the correct low speed FLA in the FLA table.® ▶ Field Modification Kits see page 9/104. ▶ Factory Modifications see page 9/119. ▶ Dimensions see page 9/166. ▶ Wiring Diagrams see page 9/178. ▶ Replacement Parts see page 9/131. 		24	J	0,1	0.25–1	A	A
			120	F	0,1	0.75–3.4	A	B
			110–120/220–240 ^①	A	0,1	3–12	A1	C
			200–208	D	0,1	5.5–22	A1	D
			220–240	G	0-1 ^{3/4}	10–40	A1	E
			277	L	2-3	13–52	B	F
			220–240/440–480 ^①	C	2-3	25–100	B	G
			440–480	H	3 ^{1/2} -4	50–200	B	H
			575–600	E				
			For other voltages and frequencies, see Factory Modifications page 9/119.					

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless [®] Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R [®] , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	3	0.75–3.4	A	32CUB†92B2V*		32CUB†92W2V*		32CUB†92F2V*		32CUB†92N2V*	
2	2	5	5	0	—	10	3–12	A1	32CUC†92B2V*		32CUC†92W2V*		32CUC†92F2V*		32CUC†92N2V*	
3	3	—	—	0	—	25	5.5–22	A1	32CUD†92B2V*		32CUD†92W2V*		32CUD†92F2V*		32CUD†92N2V*	
1/2	3/4	1 1/2	1 1/2	1	—	3	0.75–3.4	A	32DUB†92B2V*		32DUB†92W2V*		32DUB†92F2V*		32DUB†92N2V*	
2	2	5	5	1	—	10	3–12	A1	32DUC†92B2V*		32DUC†92W2V*		32DUC†92F2V*		32DUC†92N2V*	
3	3	10	10	1	—	25	5.5–22	A1	32DUD†92B2V*		32DUD†92W2V*		32DUD†92F2V*		32DUD†92N2V*	
7 1/2	7 1/2	—	—	1	—	30	10–40	A1	32DUE†92B2V*		32DUE†92W2V*		32DUE†92F2V*		32DUE†92N2V*	
—	—	15	15	—	1 1/2	40	10–40	A1	32EUE†92B2V*		32EUE†92W2V*		32EUE†92F2V*		32EUE†92N2V*	
10	15	25	25	2	—	50	13–52	B	32FUF†92B2V*		32FUF†92W2V*		32FUF†92F2V*		32FUF†92N2V*	
15	20	30	30	—	2 1/2	100	25–100	B	32GUG†92B2V*		32GUG†92W2V*		32GUG†92F2V*		32GUG†92N2V*	
25	30	50	50	3	—	125	25–100	B	32HUG†92B2V*		32HUG†92W2V*		32HUG†92F2V*		32HUG†92N2V*	
30	40	75	75	—	3 1/2	125	50–200	B	32IUH†92B2V*		32IUH†92W2V*		32IUH†92F2V*		32IUH†92N2V*	
40	50	100	100	4	—	150	50–200	B	32JUH†92B2V*		32JUH†92W2V*		32JUH†92F2V*		32JUH†92N2V*	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless [®] Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R [®] , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	3/4	1 1/2	2	0	—	3	0.75–3.4	A	32CUB†92B1V*		32CUB†92W1V*		32CUB†92F1V*		32CUB†92N1V*	
2	2	5	5	0	—	10	3–12	A1	32CUC†92B1V*		32CUC†92W1V*		32CUC†92F1V*		32CUC†92N1V*	
3	3	—	—	0	—	25	5.5–22	A1	32CUD†92B1V*		32CUD†92W1V*		32CUD†92F1V*		32CUD†92N1V*	
1/2	3/4	1 1/2	1 1/2	1	—	3	0.75–3.4	A	32DUB†92B1V*		32DUB†92W1V*		32DUB†92F1V*		32DUB†92N1V*	
2	2	5	5	1	—	10	3–12	A1	32DUC†92B1V*		32DUC†92W1V*		32DUC†92F1V*		32DUC†92N1V*	
3	3	10	10	1	—	25	5.5–22	A1	32DUD†92B1V*		32DUD†92W1V*		32DUD†92F1V*		32DUD†92N1V*	
7 1/2	7 1/2	—	—	1	—	30	10–40	A1	32DUE†92B1V*		32DUE†92W1V*		32DUE†92F1V*		32DUE†92N1V*	
—	—	15	15	—	1 1/2	40	10–40	A1	32EUE†92B1V*		32EUE†92W1V*		32EUE†92F1V*		32EUE†92N1V*	
10	15	25	25	2	—	50	13–52	B	32FUF†92B1V*		32FUF†92W1V*		32FUF†92F1V*		32FUF†92N1V*	
15	20	30	30	—	2 1/2	100	25–100	B	32GUG†92B1V*		32GUG†92W1V*		32GUG†92F1V*		32GUG†92N1V*	
25	30	50	50	3	—	125	25–100	B	32HUG†92B1V*		32HUG†92W1V*		32HUG†92F1V*		32HUG†92N1V*	
30	40	75	75	—	3 1/2	125	50–200	B	32IUH†92B1V*		32IUH†92W1V*		32IUH†92F1V*		32IUH†92N1V*	
40	50	100	100	4	—	150	50–200	B	32JUH†92B1V*		32JUH†92W1V*		32JUH†92F1V*		32JUH†92N1V*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in modified starters.

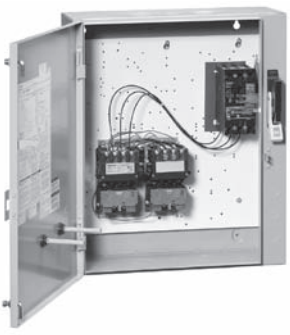
② For conduit hubs and conversion instructions, see page 9/110.

③ If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Combination Two Speed Heavy Duty Starters

MCP Type, Constant Horsepower with Solid State Overload, Class 32

Selection

	Ordering Information	Coil Table	High/Low Speed FLA Table [®]				
	<ul style="list-style-type: none"> Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. Replace the (†) with the letter that corresponds to the correct FLA in the High/Low Speed FLA table.[®] Field Modification Kits see page 9/104. Factory Modifications see page 9/119. Dimensions see page 9/166. Wiring Diagrams see page 9/178. Replacement Parts see page 9/131. 	60Hz Voltage	Letter	Size	FLA	OLR Frame Size	†
		24	J	0,1	0.25–1	A	A
		120	F	0,1	0.75–3.4	A	B
		110–120/220–240 ^①	A	0,1	3–12	A1	C
		200–208	D	0,1	5.5–22	A1	D
		220–240	G	0-1 ^{3/4}	10–40	A1	E
		277	L	2-3	13–52	B	F
		220–240/440–480 ^①	C	2-3	25–100	B	G
		440–480	H	3 ^{1/2} -4	50–200	B	H
		575–600	E				
		For other voltages and frequencies see Factory Modifications page 9/119.					
		* First (†) for high speed, second (†) for low speed. Use motor nameplate to select FLA. If motor FLA are unknown, select overload on the bases that the low speed FLA will be no greater than 50 % of high speed FLA.					

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^② , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	10	—	A or A1	32CU††92B2H*		32CU††92W2H*		32CU††92F2H*		32CU††92N2H*	
5	5	7½	7½	1	—	25	—	A or A1	32DU††92B2H*		32DU††92W2H*		32DU††92F2H*		32DU††92N2H*	
7½	7½	10	10	—	1½	40	—	A1	32EU††92B2H*		32EU††92W2H*		32EU††92F2H*		32EU††92N2H*	
7½	10	20	20	2	—	50	—	B	32FU††92B2H*		32FU††92W2H*		32FU††92F2H*		32FU††92N2H*	
10	15	25	25	—	2½	100	—	B	32GU††92B2H*		32GU††92W2H*		32GU††92F2H*		32GU††92N2H*	
20	25	40	40	3	—	100	—	B	32HU††92B2H*		32HU††92W2H*		32HU††92F2H*		32HU††92N2H*	
25	30	50	50	—	3½	125	—	B	32IU††92B2H*		32IU††92W2H*		32IU††92F2H*		32IU††92N2H*	
30	40	75	75	4	—	150	—	B	32JU††92B2H*		32JU††92W2H*		32JU††92F2H*		32JU††92N2H*	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^② , NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
2	2	3	3	0	—	10	—	A or A1	32CU††92B1H*		32CU††92W1H*		32CU††92F1H*		32CU††92N1H*	
5	5	7½	7½	1	—	25	—	A or A1	32DU††92B1H*		32DU††92W1H*		32DU††92F1H*		32DU††92N1H*	
7½	7½	10	10	—	1¾	40	—	A1	32EU††92B1H*		32EU††92W1H*		32EU††92F1H*		32EU††92N1H*	
7½	10	20	20	2	—	50	—	B	32FU††92B1H*		32FU††92W1H*		32FU††92F1H*		32FU††92N1H*	
10	15	25	25	—	2½	100	—	B	32GU††92B1H*		32GU††92W1H*		32GU††92F1H*		32GU††92N1H*	
20	25	40	40	3	—	100	—	B	32HU††92B1H*		32HU††92W1H*		32HU††92F1H*		32HU††92N1H*	
25	30	50	50	—	3¾	125	—	B	32IU††92B1H*		32IU††92W1H*		32IU††92F1H*		32IU††92N1H*	
30	40	75	75	4	—	150	—	B	32JU††92B1H*		32JU††92W1H*		32JU††92F1H*		32JU††92N1H*	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Dual voltage coils not available in modified starters.

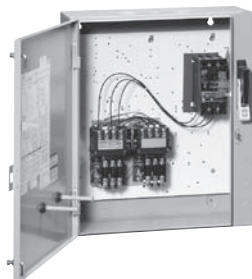
② For conduit hubs and conversion instructions, see page 9/110.

③ First † for high speed, second † for low speed. Use motor nameplate information to select FLA. If motor FLA are unknown, select overload on the basis that low speed FLA will be no greater than 50% of high speed FLA.

Combination Two Speed Heavy Duty Starters

MCP Type, Constant or Variable Torque w/Ambient Compensated Bimetal Overload, Class 32

Selection



Ordering Information

- Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- Heater elements see page 9/124. (6 Required)
- Field Modification Kits see page 9/104.
- Factory Modifications see page 9/119.
- Dimensions see page 9/166.
- Wiring Diagrams see page 9/178.
- Replacement Parts see page 9/131.
- For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact..

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 ^①	A
200–208	D
220–240	G
277	L
220–240/440–480 ^①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

One Winding Consequent Pole, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1	1	0	—	3	32CP92B2VA*81		32CP92W2VA*81		32CP92F2VA*81		32CP92N2VA*81	
1	1	3	3	0	—	10	32CP92B2VB*81		32CP92W2VB*81		32CP92F2VB*81		32CP92N2VB*81	
3	3	5	5	0	—	25	32CP92B2VC*81		32CP92W2VC*81		32CP92F2VC*81		32CP92N2VC*81	
1 1/2	1 1/2	1	1	1	—	3	32DP92B2VA*81		32DP92W2VA*81		32DP92F2VA*81		32DP92N2VA*81	
1	1	3	3	1	—	10	32DP92B2VB*81		32DP92W2VB*81		32DP92F2VB*81		32DP92N2VB*81	
3	3	7 1/2	7 1/2	1	—	25	32DP92B2VD*81		32DP92W2VD*81		32DP92F2VD*81		32DP92N2VD*81	
7 1/2	7 1/2	10	10	1	—	30	32DP92B2VE*81		32DP92W2VE*81		32DP92F2VE*81		32DP92N2VE*81	
—	—	15	15	—	1 1/4	40	32EP92B2VF*81		32EP92W2VF*81		32EP92F2VF*81		32EP92N2VF*81	
10	10	—	—	—	1 1/4	50	32EP92B2VG*81		32EP92W2VG*81		32EP92F2VG*81		32EP92N2VG*81	
—	—	20	20	2	—	40	32FP92B2VH*81		32FP92W2VH*81		32FP92F2VH*81		32FP92N2VH*81	
10	15	25	25	2	—	50	32FP92B2VJ*81		32FP92W2VJ*81		32FP92F2VJ*81		32FP92N2VJ*81	
10	15	30	30	—	2 1/2	50	32GP92B2VK*81		32GP92W2VK*81		32GP92F2VK*81		32GP92N2VK*81	
15	20	—	—	—	2 1/2	100	32GP92B2VL*81		32GP92W2VL*81		32GP92F2VL*81		32GP92N2VL*81	
—	—	30	30	3	—	50	32HP92B2VM*81		32HP92W2VM*81		32HP92F2VM*81		32HP92N2VM*81	
25	30	50	50	3	—	125	32HP92B2VN*81		32HP92W2VN*81		32HP92F2VN*81		32HP92N2VN*81	
30	40	75	75	—	3 1/2	125	32IP92B2VP*81		32IP92W2VP*81		32IP92F2VP*81		32IP92N2VP*81	
40	50	100	100	4	—	150	32JP92B2VR*81		32JP92W2VR*81		32JP92F2VR*81		32JP92N2VR*81	

Two Separate Windings, 3-Phase (Constant or Variable Torque)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1	1	0	—	3	32CP92B1VA*81		32CP92W1VA*81		32CP92F1VA*81		32CP92N1VA*81	
1	1	3	3	0	—	10	32CP92B1VB*81		32CP92W1VB*81		32CP92F1VB*81		32CP92N1VB*81	
3	3	5	5	0	—	25	32CP92B1VC*81		32CP92W1VC*81		32CP92F1VC*81		32CP92N1VC*81	
1/2	1/2	1	1	1	—	3	32DP92B1VA*81		32DP92W1VA*81		32DP92F1VA*81		32DP92N1VA*81	
1	1	3	3	1	—	10	32DP92B1VB*81		32DP92W1VB*81		32DP92F1VB*81		32DP92N1VB*81	
3	3	7 1/2	7 1/2	1	—	25	32DP92B1VD*81		32DP92W1VD*81		32DP92F1VD*81		32DP92N1VD*81	
7 1/2	7 1/2	10	10	1	—	30	32DP92B1VE*81		32DP92W1VE*81		32DP92F1VE*81		32DP92N1VE*81	
—	—	15	15	—	1 1/4	40	32EP92B1VF*81		32EP92W1VF*81		32EP92F1VF*81		32EP92N1VF*81	
10	10	—	—	—	1 1/4	50	32EP92B1VG*81		32EP92W1VG*81		32EP92F1VG*81		32EP92N1VG*81	
—	—	20	20	2	—	40	32FP92B1VH*81		32FP92W1VH*81		32FP92F1VH*81		32FP92N1VH*81	
10	15	25	25	2	—	50	32FP92B1VJ*81		32FP92W1VJ*81		32FP92F1VJ*81		32FP92N1VJ*81	
10	15	30	30	—	2 1/2	50	32GP92B1VK*81		32GP92W1VK*81		32GP92F1VK*81		32GP92N1VK*81	
15	20	—	—	—	2 1/2	100	32GP92B1VL*81		32GP92W1VL*81		32GP92F1VL*81		32GP92N1VL*81	
—	—	30	30	3	—	50	32HP92B1VM*81		32HP92W1VM*81		32HP92F1VM*81		32HP92N1VM*81	
25	30	50	50	3	—	125	32HP92B1VN*81		32HP92W1VN*81		32HP92F1VN*81		32HP92N1VN*81	
30	40	75	75	—	3 1/2	125	32IP92B1VP*81		32IP92W1VP*81		32IP92F1VP*81		32IP92N1VP*81	
40	50	100	100	4	—	150	32JP92B1VR*81		32JP92W1VR*81		32JP92F1VR*81		32JP92N1VR*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

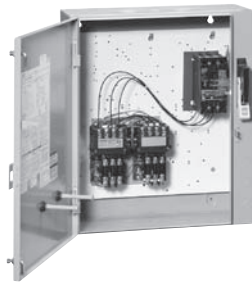
^① Dual voltage coils not available in modified starters.

^② For conduit hubs and conversion instructions, see page 9/110.

Combination Two Speed Heavy Duty Starters

MCP, Constant Horsepower w/ Ambient Compensated Bimetal Overload, Class 32

Selection



Ordering Information

- Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- Heater elements see page 9/124. (6 Required)
- Field Modification Kits see page 9/104.
- Factory Modifications see page 9/119.
- Dimensions see page 9/166.
- Wiring Diagrams see page 9/178.
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- For NO/NC SPDT contact on overload relay, replace "81" with "91". "81" indicates one NC contact..

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 ^①	A
200–208	D
220–240	G
277	L
220–240/440–480 ^①	C
440–480	H
575–600	E
For other voltages and frequencies, see Factory Modifications page 9/119.	

One Winding Consequent Pole, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$
½	½	1	1	0	—	3	32CP92B2HA*81		32CP92W2HA*81		32CP92F2HA*81		32CP92N2HA*81	
1½	1½	3	3	0	—	10	32CP92B2HB*81		32CP92W2HB*81		32CP92F2HB*81		32CP92N2HB*81	
2	2	—	—	0	—	25	32CP92B2HC*81		32CP92W2HC*81		32CP92F2HC*81		32CP92N2HC*81	
½	½	1	1	1	—	3	32DP92B2HA*81		32DP92W2HA*81		32DP92F2HA*81		32DP92N2HA*81	
1½	1½	3	3	1	—	10	32DP92B2HB*81		32DP92W2HB*81		32DP92F2HB*81		32DP92N2HB*81	
3	3	7½	7½	1	—	25	32DP92B2HD*81		32DP92W2HD*81		32DP92F2HD*81		32DP92N2HD*81	
5	5	—	—	1	—	30	32DP92B2HE*81		32DP92W2HE*81		32DP92F2HE*81		32DP92N2HE*81	
—	—	10	10	—	1¼	40	32EP92B2HF*81		32EP92W2HF*81		32EP92F2HF*81		32EP92N2HF*81	
7½	7½	—	—	—	1¾	50	32EP92B2HG*81		32EP92W2HG*81		32EP92F2HG*81		32EP92N2HG*81	
—	7½	15	20	2	—	40	32FP92B2HH*81		32FP92W2HH*81		32FP92F2HH*81		32FP92N2HH*81	
7½	10	20	—	2	—	50	32FP92B2HJ*81		32FP92W2HJ*81		32FP92F2HJ*81		32FP92N2HJ*81	
—	—	30	30	—	2½	50	32GP92B2HK*81		32GP92W2HK*81		32GP92F2HK*81		32GP92N2HK*81	
10	15	30	40	3	—	50	32HP92B2HM*81		32HP92W2HM*81		32HP92F2HM*81		32HP92N2HM*81	
20	25	40	—	3	—	100	32HP92B2HN*81		32HP92W2HN*81		32HP92F2HN*81		32HP92N2HN*81	
25	30	50	50	—	3½	125	32IP92B2HP*81		32IP92W2HP*81		32IP92F2HP*81		32IP92N2HP*81	
30	40	75	75	4	—	150	32JP92B2HR*81		32JP92W2HR*81		32JP92F2HR*81		32JP92N2HR*81	

Two Separate Windings, 3-Phase (Constant Horsepower)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 12, NEMA 3/3R ^② NEMA 4 Painted Industrial Use Weatherproof Watertight, Dust-tight	
							Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$	Catalog Number	List Price\$
½	½	1	1	0	—	3	32CP92B1HA*81		32CP92W1HA*81		32CP92F1HA*81		32CP92N1HA*81	
1½	1½	3	3	0	—	10	32CP92B1HB*81		32CP92W1HB*81		32CP92F1HB*81		32CP92N1HB*81	
2	2	—	—	0	—	25	32CP92B1HC*81		32CP92W1HC*81		32CP92F1HC*81		32CP92N1HC*81	
½	½	1	1	1	—	3	32DP92B1HA*81		32DP92W1HA*81		32DP92F1HA*81		32DP92N1HA*81	
1½	1½	3	3	1	—	10	32DP92B1HB*81		32DP92W1HB*81		32DP92F1HB*81		32DP92N1HB*81	
3	3	7½	7½	1	—	25	32DP92B1HD*81		32DP92W1HD*81		32DP92F1HD*81		32DP92N1HD*81	
5	5	—	—	1	—	30	32DP92B1HE*81		32DP92W1HE*81		32DP92F1HE*81		32DP92N1HE*81	
—	—	10	10	—	1¼	40	32EP92B1HF*81		32EP92W1HF*81		32EP92F1HF*81		32EP92N1HF*81	
7½	7½	—	—	—	1¼	50	32EP92B1HG*81		32EP92W1HG*81		32EP92F1HG*81		32EP92N1HG*81	
—	7½	15	20	2	—	40	32FP92B1HH*81		32FP92W1HH*81		32FP92F1HH*81		32FP92N1HH*81	
7½	10	20	—	2	—	50	32FP92B1HJ*81		32FP92W1HJ*81		32FP92F1HJ*81		32FP92N1HJ*81	
—	—	30	30	—	2½	50	32GP92B1HK*81		32GP92W1HK*81		32GP92F1HK*81		32GP92N1HK*81	
10	15	30	40	3	—	50	32HP92B1HM*81		32HP92W1HM*81		32HP92F1HM*81		32HP92N1HM*81	
20	25	40	—	3	—	100	32HP92B1HN*81		32HP92W1HN*81		32HP92F1HN*81		32HP92N1HN*81	
25	30	50	50	—	3½	125	32IP92B1HP*81		32IP92W1HP*81		32IP92F1HP*81		32IP92N1HP*81	
30	40	75	75	4	—	150	32JP92B1HR*81		32JP92W1HR*81		32JP92F1HR*81		32JP92N1HR*81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available in modified starters.

② For conduit hubs and conversion instructions, see page 9/110.

Reduced Voltage Heavy Duty Starters

Features and Benefits

General

Siemens manufactures the three commonly used electromechanical reduced voltage starters. Each one is designed for specific application requirements and consists of auto transformer, wye-delta and partwinding starters.

The reduced voltage starter:

- Reduces inrush current
- Provides smoother acceleration of the load
- Reduces starting torque
- Reduces stresses on mechanical linkages

Combination and non-combination reduced voltage starter sizes range from 0 to 6 including Siemens exclusive motormatched half-sizes. Enclosure types include 1, 3R/12, 4 painted and 4/4X stainless steel. UL listed file #E14900 (class 36); file #E185287 (class 37). CSA certified file #LR 6535 (class 36 & 37).



Auto Transformer Starter

- Maximum torque per amp
- Three coil auto transformer for balanced starting currents
- 50, 65 and 80% voltage taps
- Closed circuit transition
- Adjustable starting time
- Solid-state OLR overload as standard
- CPT supplied as standard
- Wide range of factory modifications



Wye-Delta Starter

- Lowest starting torque
- Closed or open circuit transition
- Adjustable starting time
- Solid-state OLR overload as standard
- CPT supplied as standard
- Wide range of factory modifications



Part-Winding Starter

- Simplest design – most economical
- Adjustable starting time
- Solid-state OLR overload as standard
- CPT supplied as standard
- Wide range of factory modifications


Various Methods of Electro-Mechanical Reduced Voltage Motor Starting —A General Comparison

Characteristic	Autotransformer			Part-Winding	Wye-Delta
	50% Tap	65% Tap	80% Tap	2 step	
Starting current drawn from line as % of that which would be drawn upon full voltage starting	25%	42%	64%	65%	33%
Starting current drawn by the motor	50%	65%	80%	65%	58%
Starting torque developed as % of that which would be developed on full voltage starting	25%	42%	64%	40%	33%
Smoothness of acceleration	First in order of Smoothness			Third in order of Smoothness	Second in order of Smoothness
Allowable accelerating times (typical)	15 seconds at 200HP max. or 30 seconds on 200HP based on NEMA medium duty transformers			5 seconds max. Limited by motor design	5-60 seconds Limited by motor design
Starting current and torque and adjustments	Adjustable within limits of various taps			Fixed	Fixed

Reduced Voltage Heavy Duty Starters

Auto Transformer with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/181. ► Replacement Parts see page 9/131. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 1 General Purpose Enclosures


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10–40	A1	36EJET6BD		60	37EJET6BDD		60A/250V	37EJET6BDF		50	37EJET6BDP	
	10	2	13–52	B	36FUFT6BD		60	37FUFT6BDD		60A/250V	37FUFT6BDF		50	37FUFT6BDP	
	15	(2½)	25–100	B	36GUGT6BD		100	37GUGT6BDD		100A/250V	37GUGT6BDF		100	37GUGT6BDP	
	25	3	25–100	B	36HUGT6BD		100	37HUGT6BDD		100A/250V	37HUGT6BDF		100	37HUGT6BDP	
	30	(3½)	50–200	B	36IUHT6BD		200	37IUHT6BDD		200A/250V	37IUHT6BDF		125	37IUHT6BDP	
	40	4	50–200	B	36JUHT6BD		200	37JUHT6BDD		200A/250V	37JUHT6BDF		150	37JUHT6BDP	
	50	5	55–250	—	—		—	—		—	—		250	37LPST6BDP	
	75	5	55–250	—	36LPUT6BD		400	37LPUT6BDD		400A/250V	37LPUT6BDF		400	37LPUT6BDP	
230	150	6	160–630	—	36MPXT6BD		600	37MPXT6BDD		600A/250V	37MPXT6BDF		600	37MPXT6BDP	
	10	(1¼)	10–40	A1	36EJET2BG		60	37EJET2BGD		60A/250V	37EJET2BGF		50	37EJET2BGP	
	15	2	13–52	B	36FUFT2BG		60	37FUFT2BGD		60A/250V	37FUFT2BGF		50	37FUFT2BGP	
	20	(2½)	25–100	B	36GUGT2BG		100	37GUGT2BGD		100A/250V	37GUGT2BGF		100	37GUGT2BGP	
	30	3	25–100	B	36HUGT2BG		100	37HUGT2BGD		100A/250V	37HUGT2BGF		100	37HUGT2BGP	
	40	(3½)	50–200	B	36IUHT2BG		200	37IUHT2BGD		200A/250V	37IUHT2BGF		125	37IUHT2BGP	
	50	4	50–200	B	36JUHT2BG		200	37JUHT2BGD		200A/250V	37JUHT2BGF		150	37JUHT2BGP	
	75	5	55–250	—	—		—	—		—	—		250	37LPST2BGP	
460	100	5	55–250	—	36LPUT2BG		400	37LPUT2BGD		400A/250V	37LPUT2BGF		400	37LPUT2BGP	
	200	6	160–630	—	36MPXT2BG		600	37MPXT2BGD		600A/250V	37MPXT2BGF		600	37MPXT2BGP	
	15	(1¼)	10–40	A1	36EJET4BH		60	37EJET4BHD		60A/600V	37EJET4BHF		50	37EJET4BHP	
	25	2	13–52	B	36FUFT4BH		60	37FUFT4BHD		60A/600V	37FUFT4BHF		50	37FUFT4BHP	
	30	(2½)	13–52	B	36GUGT4BH		100	37GUGT4BHD		100A/600V	37GUGT4BHF		100	37GUGT4BHP	
	50	3	25–100	B	36HUGT4BH		100	37HUGT4BHD		100A/600V	37HUGT4BHF		100	37HUGT4BHP	
	75	(3½)	50–200	B	36IUHT4BH		200	37IUHT4BHD		200A/600V	37IUHT4BHF		125	37IUHT4BHP	
	100	4	50–200	B	36JUHT4BH		200	37JUHT4BHD		200A/600V	37JUHT4BHF		150	37JUHT4BHP	
575	150	5	55–250	—	—		—	—		—	—		250	37LPST4BHP	
	200	5	55–250	—	36LPUT4BH		400	37LPUT4BHD		400A/600V	37LPUT4BHF		400	37LPUT4BHP	
	400	6	160–630	—	36MPXT4BH		600	37MPXT4BHD		600A/600V	37MPXT4BHF		600	37MPXT4BHP	
	15	(1¼)	10–40	A1	36EJET5BE		60	37EJET5BED		60A/600V	37EJET5BEF		50	37EJET5BEP	
	25	2	13–52	B	36FUFT5BE		60	37FUFT5BED		60A/600V	37FUFT5BEF		50	37FUFT5BEP	
	30	(2½)	13–52	B	36GUGT5BE		100	37GUGT5BED		100A/600V	37GUGT5BEF		100	37GUGT5BEP	
	50	3	25–100	B	36HUGT5BE		100	37HUGT5BED		100A/600V	37HUGT5BEF		100	37HUGT5BEP	
	75	(3½)	50–200	B	36IUHT5BE		200	37IUHT5BED		200A/600V	37IUHT5BEF		125	37IUHT5BEP	
	100	4	50–200	B	36JUHT5BE		200	37JUHT5BED		200A/600V	37JUHT5BEF		150	37JUHT5BEP	
	150	5	55–250	—	—		—	—		—	—		250	37LPST5BEP	
	200	5	55–250	—	36LPUT5BE		400	37LPUT5BED		400A/600V	37LPUT5BEF		400	37LPUT5BEP	
	400	6	160–630	—	36MPXT5BE		600	37MPXT5BED		600A/600V	37MPXT5BEF		600	37MPXT5BEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Auto Transformer with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/181. ► Replacement Parts see page 9/131. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 4 Painted Enclosures


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10–40	A1	36EUET6ED		60	37EUET6EDD		60A/250V	37EUET6EDF		50	37EUET6EDP	
	10	2	13–52	B	36FUFT6ED		60	37FUFT6EDD		60A/250V	37FUFT6EDF		50	37FUFT6EDP	
	15	(2½)	25–100	B	36GUGT6ED		100	37GUGT6EDD		100A/250V	37GUGT6EDF		100	37GUGT6EDP	
	25	3	25–100	B	36HUGT6ED		100	37HUGT6EDD		100A/250V	37HUGT6EDF		100	37HUGT6EDP	
	30	(3½)	50–200	B	36IUHT6ED		200	37IUHT6EDD		200A/250V	37IUHT6EDF		125	37IUHT6EDP	
	40	4	50–200	B	36JUHT6ED		200	37JUHT6EDD		200A/250V	37JUHT6EDF		150	37JUHT6EDP	
	50	5	55–250	—	—		—	—		—	—		250	37LPST6EDP	
	75	5	55–250	—	36LPUT6ED		400	37LPUT6EDD		400A/250V	37LPUT6EDF		400	37LPUT6EDP	
150	6	160–630	—	36MPXT6ED		600	37MPXT6EDD		600A/250V	37MPXT6EDF		600	37MPXT6EDP		
230	10	(1¼)	10–40	A1	36EUET2EG		60	37EUET2EGD		60A/250V	37EUET2EGF		50	37EUET2EGP	
	15	2	13–52	B	36FUFT2EG		60	37FUFT2EGD		60A/250V	37FUFT2EGF		50	37FUFT2EGP	
	20	(2½)	25–100	B	36GUGT2EG		100	37GUGT2EGD		100A/250V	37GUGT2EGF		100	37GUGT2EGP	
	30	3	25–100	B	36HUGT2EG		100	37HUGT2EGD		100A/250V	37HUGT2EGF		100	37HUGT2EGP	
	40	(3½)	50–200	B	36IUHT2EG		200	37IUHT2EGD		200A/250V	37IUHT2EGF		125	37IUHT2EGP	
	50	4	50–200	B	36JUHT2EG		200	37JUHT2EGD		200A/250V	37JUHT2EGF		150	37JUHT2EGP	
	75	5	55–250	—	—		—	—		—	—		250	37LPST2EGP	
	100	5	55–250	—	36LPUT2EG		400	37LPUT2EGD		400A/250V	37LPUT2EGF		400	37LPUT2EGP	
200	6	160–630	—	36MPXT2EG		600	37MPXT2EGD		600A/250V	37MPXT2EGF		600	37MPXT2EGP		
460	15	(1¼)	10–40	A1	36EUET4EH		60	37EUET4EHD		60A/600V	37EUET4EHF		50	37EUET4EHP	
	25	2	13–52	B	36FUFT4EH		60	37FUFT4EHD		60A/600V	37FUFT4EHF		50	37FUFT4EHP	
	30	(2½)	13–52	B	36GUGT4EH		100	37GUGT4EHD		100A/600V	37GUGT4EHF		100	37GUGT4EHP	
	50	3	25–100	B	36HUGT4EH		100	37HUGT4EHD		100A/600V	37HUGT4EHF		100	37HUGT4EHP	
	75	(3½)	50–200	B	36IUHT4EH		200	37IUHT4EHD		200A/600V	37IUHT4EHF		125	37IUHT4EHP	
	100	4	50–200	B	36JUHT4EH		200	37JUHT4EHD		200A/600V	37JUHT4EHF		150	37JUHT4EHP	
	150	5	55–250	—	—		—	—		—	—		250	37LPST4EHP	
	200	5	55–250	—	36LPUT4EH		400	37LPUT4EHD		400A/600V	37LPUT4EHF		400	37LPUT4EHP	
400	6	160–630	—	36MPXT4EH		600	37MPXT4EHD		600A/600V	37MPXT4EHF		600	37MPXT4EHP		
575	15	(1¼)	10–40	A1	36EUET5EE		60	37EUET5EED		60A/600V	37EUET5EEF		50	37EUET5EEP	
	25	2	13–52	B	36FUFT5EE		60	37FUFT5EED		60A/600V	37FUFT5EEF		50	37FUFT5EEP	
	30	(2½)	13–52	B	36GUGT5EE		100	37GUGT5EED		100A/600V	37GUGT5EEF		100	37GUGT5EEP	
	50	3	25–100	B	36HUGT5EE		100	37HUGT5EED		100A/600V	37HUGT5EEF		100	37HUGT5EEP	
	75	(3½)	50–200	B	36IUHT5EE		200	37IUHT5EED		200A/600V	37IUHT5EEF		125	37IUHT5EEP	
	100	4	50–200	B	36JUHT5EE		200	37JUHT5EED		200A/600V	37JUHT5EEF		150	37JUHT5EEP	
	150	5	55–250	—	—		—	—		—	—		250	37LPST5EEP	
	200	5	55–250	—	36LPUT5EE		400	37LPUT5EED		400A/600V	37LPUT5EEF		400	37LPUT5EEP	
400	6	160–630	—	36MPXT5EE		600	37MPXT5EED		600A/600V	37MPXT5EEF		600	37MPXT5EEP		

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Auto Transformer with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/181. ► Replacement Parts see page 9/131. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 4/4X Stainless Steel Enclosures

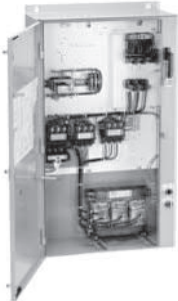
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10-40	A1	36EJET6WD		60	37EJET6WDD		60A/250V	37EJET6WDF		50	37EJET6WDP	
	10	2	13-52	B	36FUT6WD		60	37FUT6WDD		60A/250V	37FUT6WDF		50	37FUT6WDP	
	15	(2½)	25-100	B	36GUGT6WD		100	37GUGT6WDD		100A/250V	37GUGT6WDF		100	37GUGT6WDP	
	25	3	25-100	B	36HUGT6WD		100	37HUGT6WDD		100A/250V	37HUGT6WDF		100	37HUGT6WDP	
	30	(3½)	50-200	B	36IUHT6WD		200	37IUHT6WDD		200A/250V	37IUHT6WDF		125	37IUHT6WDP	
	40	4	50-200	B	36JUHT6WD		200	37JUHT6WDD		200A/250V	37JUHT6WDF		150	37JUHT6WDP	
230	10	(1¼)	10-40	A1	36EJET2WG		60	37EJET2WGD		60A/250V	37EJET2WGF		50	37EJET2WGP	
	15	2	13-52	B	36FUT2WG		60	37FUT2WGD		60A/250V	37FUT2WGF		50	37FUT2WGP	
	20	(2½)	25-100	B	36GUGT2WG		100	37GUGT2WGD		100A/250V	37GUGT2WGF		100	37GUGT2WGP	
	30	3	25-100	B	36HUGT2WG		100	37HUGT2WGD		100A/250V	37HUGT2WGF		100	37HUGT2WGP	
	40	(3½)	50-200	B	36IUHT2WG		200	37IUHT2WGD		200A/250V	37IUHT2WGF		125	37IUHT2WGP	
	50	4	50-200	B	36JUHT2WG		200	37JUHT2WGD		200A/250V	37JUHT2WGF		150	37JUHT2WGP	
460	15	(1¼)	10-40	A1	36EJET4WH		60	37EJET4WHD		60A/600V	37EJET4WHF		50	37EJET4WHP	
	25	2	13-52	B	36FUT4WH		60	37FUT4WHD		60A/600V	37FUT4WHF		50	37FUT4WHP	
	30	(2½)	13-52	B	36GUGT4WH		100	37GUGT4WHD		100A/600V	37GUGT4WHF		100	37GUGT4WHP	
	50	3	25-100	B	36HUGT4WH		100	37HUGT4WHD		100A/600V	37HUGT4WHF		100	37HUGT4WHP	
	75	(3½)	50-200	B	36IUHT4WH		200	37IUHT4WHD		200A/600V	37IUHT4WHF		125	37IUHT4WHP	
	100	4	50-200	B	36JUHT4WH		200	37JUHT4WHD		200A/600V	37JUHT4WHF		150	37JUHT4WHP	
575	15	(1¼)	10-40	A1	36EJET5WE		60	37EJET5WED		60A/600V	37EJET5WEF		50	37EJET5WEP	
	25	2	13-52	B	36FUT5WE		60	37FUT5WED		60A/600V	37FUT5WEF		50	37FUT5WEP	
	30	(2½)	13-52	B	36GUGT5WE		100	37GUGT5WED		100A/600V	37GUGT5WEF		100	37GUGT5WEP	
	50	3	25-100	B	36HUGT5WE		100	37HUGT5WED		100A/600V	37HUGT5WEF		100	37HUGT5WEP	
	75	(3½)	50-200	B	36IUHT5WE		200	37IUHT5WED		200A/600V	37IUHT5WEF		125	37IUHT5WEP	
	100	4	50-200	B	36JUHT5WE		200	37JUHT5WED		200A/600V	37JUHT5WEF		150	37JUHT5WEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Auto Transformer with Solid State Overload, Class 36 & 37

Selection

	Ordering Information	Coil and Control Voltage
	<ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/181. ► Replacement Parts see page 9/131. 	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 12 Enclosures (Supplied as NEMA 12, field convertible to 3/3R)^①

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	(1¼)	10–40	A1	36EUT6ND		60	37EUT6NDD		60A/250V	37EUT6NDF		50	37EUT6NDP	
	10	2	13–52	B	36FUT6ND		60	37FUT6NDD		60A/250V	37FUT6NDF		50	37FUT6NDP	
	15	(2½)	25–100	B	36GUGT6ND		100	37GUGT6NDD		100A/250V	37GUGT6NDF		100	37GUGT6NDP	
	25	3	25–100	B	36HUGT6ND		100	37HUGT6NDD		100A/250V	37HUGT6NDF		100	37HUGT6NDP	
	30	(3½)	50–200	B	36IUHT6ND		200	37IUHT6NDD		200A/250V	37IUHT6NDF		125	37IUHT6NDP	
	40	4	50–200	B	36JUHT6ND		200	37JUHT6NDD		200A/250V	37JUHT6NDF		150	37JUHT6NDP	
	50	5	55–250	—	—		—	—		—	—		250	37LPST6NDP	
	75	5	55–250	—	36LPUT6ND		400	37LPUT6NDD		400A/250V	37LPUT6NDF		400	37LPUT6NDP	
230	150	6	160–630	—	36MPXT6ND		600	37MPXT6NDD		600A/250V	37MPXT6NDF		600	37MPXT6NDP	
	10	(1¼)	10–40	A1	36EUT2NG		60	37EUT2NGD		60A/250V	37EUT2NGF		50	37EUT2NGP	
	15	2	13–52	B	36FUT2NG		60	37FUT2NGD		60A/250V	37FUT2NGF		50	37FUT2NGP	
	20	(2½)	25–100	B	36GUGT2NG		100	37GUGT2NGD		100A/250V	37GUGT2NGF		100	37GUGT2NGP	
	30	3	25–100	B	36HUGT2NG		100	37HUGT2NGD		100A/250V	37HUGT2NGF		100	37HUGT2NGP	
	40	(3½)	50–200	B	36IUHT2NG		200	37IUHT2NGD		200A/250V	37IUHT2NGF		125	37IUHT2NGP	
	50	4	50–200	B	36JUHT2NG		200	37JUHT2NGD		200A/250V	37JUHT2NGF		150	37JUHT2NGP	
	75	5	55–250	—	—		—	—		—	—		250	37LPST2NGP	
460	100	5	55–250	—	36LPUT2NG		400	37LPUT2NGD		400A/250V	37LPUT2NGF		400	37LPUT2NGP	
	200	6	160–630	—	36MPXT2NG		600	37MPXT2NGD		600A/250V	37MPXT2NGF		600	37MPXT2NGP	
	15	(1¼)	10–40	A1	36EUT4NH		60	37EUT4NHD		60A/600V	37EUT4NHF		50	37EUT4NHP	
	25	2	13–52	B	36FUT4NH		60	37FUT4NHD		60A/600V	37FUT4NHF		50	37FUT4NHP	
	30	(2½)	13–52	B	36GUGT4NH		100	37GUGT4NHD		100A/600V	37GUGT4NHF		100	37GUGT4NHP	
	50	3	25–100	B	36HUGT4NH		100	37HUGT4NHD		100A/600V	37HUGT4NHF		100	37HUGT4NHP	
	75	(3½)	50–200	B	36IUHT4NH		200	37IUHT4NHD		200A/600V	37IUHT4NHF		125	37IUHT4NHP	
	100	4	50–200	B	36JUHT4NH		200	37JUHT4NHD		200A/600V	37JUHT4NHF		150	37JUHT4NHP	
575	150	5	55–250	—	—		—	—		—	—		250	37LPST4NHP	
	200	5	55–250	—	36LPUT4NH		400	37LPUT4NHD		400A/600V	37LPUT4NHF		400	37LPUT4NHP	
	400	6	160–630	—	36MPXT4NH		600	37MPXT4NHD		600A/600V	37MPXT4NHF		600	37MPXT4NHP	
	15	(1¼)	10–40	A1	36EUT5NE		60	37EUT5NED		60A/600V	37EUT5NEF		50	37EUT5NEP	
	25	2	13–52	B	36FUT5NE		60	37FUT5NED		60A/600V	37FUT5NEF		50	37FUT5NEP	
	30	(2½)	13–52	B	36GUGT5NE		100	37GUGT5NED		100A/600V	37GUGT5NEF		100	37GUGT5NEP	
	50	3	25–100	B	36HUGT5NE		100	37HUGT5NED		100A/600V	37HUGT5NEF		100	37HUGT5NEP	
	75	(3½)	50–200	B	36IUHT5NE		200	37IUHT5NED		200A/600V	37IUHT5NEF		125	37IUHT5NEP	
	100	4	50–200	B	36JUHT5NE		200	37JUHT5NED		200A/600V	37JUHT5NEF		150	37JUHT5NEP	
	150	5	55–250	—	—		—	—		—	—		250	37LPST5NEP	
	200	5	55–250	—	36LPUT5NE		400	37LPUT5NED		400A/600V	37LPUT5NEF		400	37LPUT5NEP	
	400	6	160–630	—	36MPXT5NE		600	37MPXT5NED		600A/600V	37MPXT5NEF		600	37MPXT5NEP	


Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

^① See page 9/110 for conduit hubs and conversion instructions.

Reduced Voltage Heavy Duty Starters

2 Step Part Winding with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/180. ► Replacement Parts see page 9/131. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 1 General Purpose Enclosures


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	7½	0	5.5–22	A1	36CUDP6BD		60	37CUDP6BDD		60A/250V	37CUDP6BDF		30	37CUDP6BDP	
	10	1	5.5–22	A1	36DUDP6BD		60	37DUDP6BDD		60A/250V	37DUDP6BDF		50	37DUDP6BDP	
	15	(1¼)	10–40	A1	36EUEP6BD		100	37EUEP6BDD		100A/250V	37EUEP6BDF		100	37EUEP6BDP	
	20	2	13–52	B	36FUEP6BD		100	37FUEP6BDD		100A/250V	37FUEP6BDF		100	37FUEP6BDP	
	30	(2½)	25–100	B	36GUGP6BD		200	37GUGP6BDD		200A/250V	37GUGP6BDF		125	37GUGP6BDP	
	40	3	25–100	B	36HUGP6BD		200	37HUGP6BDD		200A/250V	37HUGP6BDF		150	37HUGP6BDP	
	50	(3½)	50–200	B	36IUHP6BD		200	37IUHP6BDD		200A/250V	37IUHP6BDF		250	37IUHP6BDP	
	75	4	50–200	B	36JUHP6BD		400	37JUHP6BDD		400A/250V	37JUHP6BDF		400	37JUHP6BDP	
230	100	5	55–250	—	—		—	—		—	—		600	37LPSP6BDP	
	150	5	55–250	—	36LPUP6BD		600	37LPUP6BDD		600A/250V	37LPUP6BDF		600	37LPUP6BDP	
	7½	0	5.5–22	A1	36CUDP2BG		60	37CUDP2BGD		60A/250V	37CUDP2BGF		30	37CUDP2BGP	
	10	1	5.5–22	A1	36DUDP2BG		60	37DUDP2BGD		60A/250V	37DUDP2BGF		50	37DUDP2BGP	
	20	(1½)	10–40	A1	36EUEP2BG		100	37EUEP2BGD		100A/250V	37EUEP2BGF		100	37EUEP2BGP	
	25	2	13–52	B	36FUEP2BG		100	37FUEP2BGD		100A/250V	37FUEP2BGF		100	37FUEP2BGP	
	30	(2½)	25–100	B	36GUGP2BG		200	37GUGP2BGD		200A/250V	37GUGP2BGF		100	37GUGP2BGP	
	50	3	25–100	B	36HUGP2BG		200	37HUGP2BGD		200A/250V	37HUGP2BGF		150	37HUGP2BGP	
460	60	(3½)	50–200	B	36IUHP2BG		200	37IUHP2BGD		200A/250V	37IUHP2BGF		250	37IUHP2BGP	
	75	4	50–200	B	36JUHP2BG		400	37JUHP2BGD		400A/250V	37JUHP2BGF		250	37JUHP2BGP	
	125	5	55–250	—	—		—	—		—	—		400	37LPSP2BGP	
	150	5	55–250	—	36LPUP2BG		600	37LPUP2BGD		600A/250V	37LPUP2BGF		600	37LPUP2BGP	
	300	6	160–630	—	36MPXP2BG		1200	37MPXP2BGD		1200A/250V	37MPXP2BGF		1200	37MPXP2BGP	
	10	0	5.5–22	A1	36CUDP4BH		30	37CUDP4BHD		30A/600V	37CUDP4BHF		30	37CUDP4BHP	
	15	1	5.5–22	A1	36DUDP4BH		60	37DUDP4BHD		60A/600V	37DUDP4BHF		30	37DUDP4BHP	
	30	(1¼)	10–40	A1	36EUEP4BH		60	37EUEP4BHD		60A/600V	37EUEP4BHF		50	37EUEP4BHP	
575	40	2	13–52	B	36FUEP4BH		100	37FUEP4BHD		100A/600V	37FUEP4BHF		100	37FUEP4BHP	
	60	(2½)	25–100	B	36GUGP4BH		200	37GUGP4BHD		200A/600V	37GUGP4BHF		100	37GUGP4BHP	
	75	3	25–100	B	36HUGP4BH		200	37HUGP4BHD		200A/600V	37HUGP4BHF		125	37HUGP4BHP	
	100	(3½)	50–200	B	36IUHP4BH		200	37IUHP4BHD		200A/600V	37IUHP4BHF		150	37IUHP4BHP	
	150	4	50–200	B	36JUHP4BH		400	37JUHP4BHD		400A/600V	37JUHP4BHF		250	37JUHP4BHP	
	250	5	55–250	—	—		—	—		—	—		400	37LPSP4BHP	
	350	5	55–250	—	36LPUP4BH		600	37LPUP4BHD		600A/600V	37LPUP4BHF		600	37LPUP4BHP	
	600	6	160–630	—	36MPXP4BH		1200	37MPXP4BHD		1200A/600V	37MPXP4BHF		1200	37MPXP4BHP	
575	10	0	5.5–22	A1	36CUDP5BE		30	37CUDP5BED		30A/600V	37CUDP5BEF		30	37CUDP5BEP	
	15	1	5.5–22	A1	36DUDP5BE		60	37DUDP5BED		60A/600V	37DUDP5BEF		30	37DUDP5BEP	
	30	(1¼)	10–40	A1	36EUEP5BE		60	37EUEP5BED		60A/600V	37EUEP5BEF		50	37EUEP5BEP	
	40	2	13–52	B	36FUEP5BE		60	37FUEP5BED		60A/600V	37FUEP5BEF		50	37FUEP5BEP	
	60	(2½)	25–100	B	36GUGP5BE		100	37GUGP5BED		100A/600V	37GUGP5BEF		100	37GUGP5BEP	
	75	3	25–100	B	36HUGP5BE		200	37HUGP5BED		200A/600V	37HUGP5BEF		125	37HUGP5BEP	
	100	(3½)	50–200	B	36IUHP5BE		400	37IUHP5BED		400A/600V	37IUHP5BEF		150	37IUHP5BEP	
	150	4	50–200	B	36JUHP5BE		400	37JUHP5BED		400A/600V	37JUHP5BEF		250	37JUHP5BEP	
575	250	5	55–250	—	—		—	—		400A/600V	37LPSP5BEF		—	—	
	350	5	55–250	—	36LPUP5BE		600	37LPUP5BED		600A/600V	37LPUP5BEF		400	37LPUP5BEP	
	600	6	160–630	—	36MPXP5BE		1200	37MPXP5BED		1200A/600V	37MPXP5BEF		1200	37MPXP5BEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

2 Step Part Winding with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/180. ► Replacement Parts see page 9/131. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 4 Painted Enclosures


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	7½	0	5.5–22	A1	36CUDP6ED		60	37CUDP6EDD		60A/250V	37CUDP6EDF		30	37CUDP6EDP	
	10	1	5.5–22	A1	36DUDP6ED		60	37DUDP6EDD		60A/250V	37DUDP6EDF		50	37DUDP6EDP	
	15	(1¼)	10–40	A1	36EUEP6ED		100	37EUEP6EDD		100A/250V	37EUEP6EDF		100	37EUEP6EDP	
	20	2	13–52	B	36FUEP6ED		100	37FUEP6EDD		100A/250V	37FUEP6EDF		100	37FUEP6EDP	
	30	(2½)	25–100	B	36GUGP6ED		200	37GUGP6EDD		200A/250V	37GUGP6EDF		125	37GUGP6EDP	
	40	3	25–100	B	36HUGP6ED		200	37HUGP6EDD		200A/250V	37HUGP6EDF		150	37HUGP6EDP	
	50	(3½)	50–200	B	36IUHP6ED		200	37IUHP6EDD		200A/250V	37IUHP6EDF		250	37IUHP6EDP	
	75	4	50–200	B	36JUHP6ED		400	37JUHP6EDD		400A/250V	37JUHP6EDF		400	37JUHP6EDP	
230	100	5	55–250	—	—		—	—		—	—		600	37LSP6EDP	
	150	5	55–250	—	36LPUP6ED		600	37LPUP6EDD		600A/250V	37LPUP6EDF		600	37LPUP6EDP	
	7½	0	5.5–22	A1	36CUDP2EG		60	37CUDP2EGD		60A/250V	37CUDP2EGF		30	37CUDP2EGP	
	10	1	5.5–22	A1	36DUDP2EG		60	37DUDP2EGD		60A/250V	37DUDP2EGF		50	37DUDP2EGP	
	20	(1½)	10–40	A1	36EUEP2EG		100	37EUEP2EGD		100A/250V	37EUEP2EGF		100	37EUEP2EGP	
	25	2	13–52	B	36FUEP2EG		100	37FUEP2EGD		100A/250V	37FUEP2EGF		100	37FUEP2EGP	
	30	(2½)	25–100	B	36GUGP2EG		200	37GUGP2EGD		200A/250V	37GUGP2EGF		100	37GUGP2EGP	
	50	3	25–100	B	36HUGP2EG		200	37HUGP2EGD		200A/250V	37HUGP2EGF		150	37HUGP2EGP	
460	60	(3½)	50–200	B	36IUHP2EG		200	37IUHP2EGD		200A/250V	37IUHP2EGF		250	37IUHP2EGP	
	75	4	50–200	B	36JUHP2EG		400	37JUHP2EGD		400A/250V	37JUHP2EGF		250	37JUHP2EGP	
	125	5	55–250	—	—		—	—		—	—		400	37LSP2EGP	
	150	5	55–250	—	36LPUP2EG		600	37LPUP2EGD		600A/250V	37LPUP2EGF		600	37LPUP2EGP	
	300	6	160–630	—	36MPXP2EG		1200	37MPXP2EGD		1200A/250V	37MPXP2EGF		1200	37MPXP2EGP	
	10	0	5.5–22	A1	36CUDP4EH		30	37CUDP4EHD		30A/600V	37CUDP4EHF		30	37CUDP4EHP	
	15	1	5.5–22	A1	36DUDP4EH		60	37DUDP4EHD		60A/600V	37DUDP4EHF		30	37DUDP4EHP	
	30	(1¼)	10–40	A1	36EUEP4EH		60	37EUEP4EHD		60A/600V	37EUEP4EHF		50	37EUEP4EHP	
575	40	2	13–52	B	36FUEP4EH		100	37FUEP4EHD		100A/600V	37FUEP4EHF		100	37FUEP4EHP	
	60	(2½)	25–100	B	36GUGP4EH		200	37GUGP4EHD		200A/600V	37GUGP4EHF		100	37GUGP4EHP	
	75	3	25–100	B	36HUGP4EH		200	37HUGP4EHD		200A/600V	37HUGP4EHF		125	37HUGP4EHP	
	100	(3½)	50–200	B	36IUHP4EH		200	37IUHP4EHD		200A/600V	37IUHP4EHF		150	37IUHP4EHP	
	150	4	50–200	B	36JUHP4EH		400	37JUHP4EHD		400A/600V	37JUHP4EHF		250	37JUHP4EHP	
	250	5	55–250	—	—		—	—		—	—		400	37LSP4EHP	
	350	5	55–250	—	36LPUP4EH		600	37LPUP4EHD		600A/600V	37LPUP4EHF		600	37LPUP4EHP	
	600	6	160–630	—	36MPXP4EH		1200	37MPXP4EHD		1200A/600V	37MPXP4EHF		1200	37MPXP4EHP	
575	10	0	5.5–22	A1	36CUDP5EE		30	37CUDP5EED		30A/600V	37CUDP5EEF		30	37CUDP5EEP	
	15	1	5.5–22	A1	36DUDP5EE		60	37DUDP5EED		60A/600V	37DUDP5EEF		30	37DUDP5EEP	
	30	(1¼)	10–40	A1	36EUEP5EE		60	37EUEP5EED		60A/600V	37EUEP5EEF		50	37EUEP5EEP	
	40	2	13–52	B	36FUEP5EE		60	37FUEP5EED		60A/600V	37FUEP5EEF		50	37FUEP5EEP	
	60	(2½)	25–100	B	36GUGP5EE		100	37GUGP5EED		100A/600V	37GUGP5EEF		100	37GUGP5EEP	
	75	3	25–100	B	36HUGP5EE		200	37HUGP5EED		200A/600V	37HUGP5EEF		125	37HUGP5EEP	
	100	(3½)	50–200	B	36IUHP5EE		400	37IUHP5EED		400A/600V	37IUHP5EEF		150	37IUHP5EEP	
	150	4	50–200	B	36JUHP5EE		400	37JUHP5EED		400A/600V	37JUHP5EEF		250	37JUHP5EEP	
575	250	5	55–250	—	—		—	—		400A/600V	37LSP5EEF		—	—	
	350	5	55–250	—	36LPUP5EE		600	37LPUP5EED		600A/600V	37LPUP5EEF		400	37LPUP5EEP	
	600	6	160–630	—	36MPXP5EE		1200	37MPXP5EED		1200A/600V	37MPXP5EEF		1200	37MPXP5EEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

2 Step Part Winding with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/180. ► Replacement Parts see page 9/131. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 4/4X Stainless Steel Enclosures


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect		Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	Circuit Breaker Amps	Catalog Number	List Price \$
200	7½	0	5.5–22	A1	36CUDP6WD		60	37CUDP6WDD		60A/250V	37CUDP6WDF	30	37CUDP6WDP	
	10	1	5.5–22	A1	36DUDP6WD		60	37DUDP6WDD		60A/250V	37DUDP6WDF	50	37DUDP6WDP	
	15	(1¼)	10–40	A1	36EUEP6WD		100	37EUEP6WDD		100A/250V	37EUEP6WDF	100	37EUEP6WDP	
	20	2	13–52	B	36FUF6WD		100	37FUF6WDD		100A/250V	37FUF6WDF	100	37FUF6WDP	
	30	(2½)	25–100	B	36GUGP6WD		200	37GUGP6WDD		200A/250V	37GUGP6WDF	125	37GUGP6WDP	
	40	3	25–100	B	36HUGP6WD		200	37HUGP6WDD		200A/250V	37HUGP6WDF	150	37HUGP6WDP	
	50	(3½)	50–200	B	36IUHP6WD		200	37IUHP6WDD		200A/250V	37IUHP6WDF	250	37IUHP6WDP	
230	7½	0	5.5–22	A1	36CUDP2WG		60	37CUDP2WGD		60A/250V	37CUDP2WGF	30	37CUDP2WGP	
	10	1	5.5–22	A1	36DUDP2WG		60	37DUDP2WGD		60A/250V	37DUDP2WGF	50	37DUDP2WGP	
	20	(1½)	10–40	A1	36EUEP2WG		100	37EUEP2WGD		100A/250V	37EUEP2WGF	100	37EUEP2WGP	
	25	2	13–52	B	36FUF2WG		100	37FUF2WGD		100A/250V	37FUF2WGF	100	37FUF2WGP	
	30	(2½)	25–100	B	36GUGP2WG		200	37GUGP2WGD		200A/250V	37GUGP2WGF	100	37GUGP2WGP	
	50	3	25–100	B	36HUGP2WG		200	37HUGP2WGD		200A/250V	37HUGP2WGF	150	37HUGP2WGP	
	60	(3½)	50–200	B	36IUHP2WG		200	37IUHP2WGD		200A/250V	37IUHP2WGF	250	37IUHP2WGP	
460	7½	0	5.5–22	A1	36CUDP4WH		30	37CUDP4WHD		30A/600V	37CUDP4WHF	30	37CUDP4WHP	
	15	1	5.5–22	A1	36DUDP4WH		60	37DUDP4WHD		60A/600V	37DUDP4WHF	30	37DUDP4WHP	
	30	(1¼)	10–40	A1	36EUEP4WH		60	37EUEP4WHD		60A/600V	37EUEP4WHF	50	37EUEP4WHP	
	40	2	13–52	B	36FUF4WH		100	37FUF4WHD		100A/600V	37FUF4WHF	100	37FUF4WHP	
	60	(2½)	25–100	B	36GUGP4WH		200	37GUGP4WHD		200A/600V	37GUGP4WHF	100	37GUGP4WHP	
	75	3	25–100	B	36HUGP4WH		200	37HUGP4WHD		200A/600V	37HUGP4WHF	125	37HUGP4WHP	
	100	(3½)	50–200	B	36IUHP4WH		200	37IUHP4WHD		200A/600V	37IUHP4WHF	150	37IUHP4WHP	
575	150	4	50–200	B	36JUHP4WH		400	37JUHP4WHD		400A/600V	37JUHP4WHF	250	37JUHP4WHP	
	10	0	5.5–22	A1	36CUDP5WE		30	37CUDP5WED		30A/600V	37CUDP5WEF	30	37CUDP5WEP	
	15	1	5.5–22	A1	36DUDP5WE		60	37DUDP5WED		60A/600V	37DUDP5WEF	30	37DUDP5WEP	
	30	(1¼)	10–40	A1	36EUEP5WE		60	37EUEP5WED		60A/600V	37EUEP5WEF	50	37EUEP5WEP	
	40	2	13–52	B	36FUF5WE		60	37FUF5WED		60A/600V	37FUF5WEF	50	37FUF5WEP	
	60	(2½)	25–100	B	36GUGP5WE		100	37GUGP5WED		100A/600V	37GUGP5WEF	100	37GUGP5WEP	
	75	3	25–100	B	36HUGP5WE		200	37HUGP5WED		200A/600V	37HUGP5WEF	125	37HUGP5WEP	
	100	(3½)	50–200	B	36IUHP5WE		400	37IUHP5WED		400A/600V	37IUHP5WEF	150	37IUHP5WEP	
	150	4	50–200	B	36JUHP5WE		400	37JUHP5WED		400A/600V	37JUHP5WEF	250	37JUHP5WEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

2 Step Part Winding with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/180. ► Replacement Parts see page 9/131. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 12 Enclosures (Supplied as NEMA 12, field convertible to 3/3R)^①

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Call Combination Fusible Disconnect Call			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	7½	0	5.5–22	A1	36CUDP6ND		60	37CUDP6NDD		60A/250V	37CUDP6NDF		30	37CUDP6NDP	
	10	1	5.5–22	A1	36DUDP6ND		60	37DUDP6NDD		60A/250V	37DUDP6NDF		50	37DUDP6NDP	
	15	(1¼)	10–40	A1	36EUEP6ND		100	37EUEP6NDD		100A/250V	37EUEP6NDF		100	37EUEP6NDP	
	20	2	13–52	B	36FUF6ND		100	37FUF6NDD		100A/250V	37FUF6NDF		100	37FUF6NDP	
	30	(2½)	25–100	B	36GUGP6ND		200	37GUGP6NDD		200A/250V	37GUGP6NDF		125	37GUGP6NDP	
	40	3	25–100	B	36HUGP6ND		200	37HUGP6NDD		200A/250V	37HUGP6NDF		150	37HUGP6NDP	
	50	(3½)	50–200	B	36IUHP6ND		200	37IUHP6NDD		200A/250V	37IUHP6NDF		250	37IUHP6NDP	
	75	4	50–200	B	36JUHP6ND		400	37JUHP6NDD		400A/250V	37JUHP6NDF		400	37JUHP6NDP	
	100	5	55–250	—	—		—	—		—	—		600	37LSP6NDP	
150	5	55–250	—	—	36LPUP6ND		600	37LPUP6NDD		600A/250V	37LPUP6NDF		600	37LPUP6NDP	
230	7½	0	5.5–22	A1	36CUDP2NG		60	37CUDP2NGD		60A/250V	37CUDP2NGF		30	37CUDP2NGP	
	10	1	5.5–22	A1	36DUDP2NG		60	37DUDP2NGD		60A/250V	37DUDP2NGF		50	37DUDP2NGP	
	20	(1½)	10–40	A1	36EUEP2NG		100	37EUEP2NGD		100A/250V	37EUEP2NGF		100	37EUEP2NGP	
	25	2	13–52	B	36FUF2NG		100	37FUF2NGD		100A/250V	37FUF2NGF		100	37FUF2NGP	
	30	(2½)	25–100	B	36GUGP2NG		200	37GUGP2NGD		200A/250V	37GUGP2NGF		100	37GUGP2NGP	
	50	3	25–100	B	36HUGP2NG		200	37HUGP2NGD		200A/250V	37HUGP2NGF		150	37HUGP2NGP	
	60	(3½)	50–200	B	36IUHP2NG		200	37IUHP2NGD		200A/250V	37IUHP2NGF		250	37IUHP2NGP	
	75	4	50–200	B	36JUHP2NG		400	37JUHP2NGD		400A/250V	37JUHP2NGF		250	37JUHP2NGP	
	125	5	55–250	—	—		—	—		—	—		400	37LSP2NGP	
150	5	55–250	—	—	36LPUP2NG		600	37LPUP2NGD		600A/250V	37LPUP2NGF		600	37LPUP2NGP	
300	6	160–630	—	—	36MPXP2NG		1200	37MPXP2NGD		1200A/250V	37MPXP2NGF		1200	37MPXP2NGP	
460	10	0	5.5–22	A1	36CUDP4NH		30	37CUDP4NHD		30A/600V	37CUDP4NHF		30	37CUDP4NHP	
	15	1	5.5–22	A1	36DUDP4NH		60	37DUDP4NHD		60A/600V	37DUDP4NHF		30	37DUDP4NHP	
	30	(1¼)	10–40	A1	36EUEP4NH		60	37EUEP4NHD		60A/600V	37EUEP4NHF		50	37EUEP4NHP	
	40	2	13–52	B	36FUF4NH		100	37FUF4NHD		100A/600V	37FUF4NHF		100	37FUF4NHP	
	60	(2½)	25–100	B	36GUGP4NH		200	37GUGP4NHD		200A/600V	37GUGP4NHF		100	37GUGP4NHP	
	75	3	25–100	B	36HUGP4NH		200	37HUGP4NHD		200A/600V	37HUGP4NHF		125	37HUGP4NHP	
	100	(3½)	50–200	B	36IUHP4NH		200	37IUHP4NHD		200A/600V	37IUHP4NHF		150	37IUHP4NHP	
	150	4	50–200	B	36JUHP4NH		400	37JUHP4NHD		400A/600V	37JUHP4NHF		250	37JUHP4NHP	
	250	5	55–250	—	—		—	—		—	—		400	37LSP4NHP	
350	5	55–250	—	—	36LPUP4NH		600	37LPUP4NHD		600A/600V	37LPUP4NHF		600	37LPUP4NHP	
600	6	160–630	—	—	36MPXP4NH		1200	37MPXP4NHD		1200A/600V	37MPXP4NHF		1200	37MPXP4NHP	
575	10	0	5.5–22	A1	36CUDP5NE		30	37CUDP5NED		30A/600V	37CUDP5NEF		30	37CUDP5NEP	
	15	1	5.5–22	A1	36DUDP5NE		60	37DUDP5NED		60A/600V	37DUDP5NEF		30	37DUDP5NEP	
	30	(1¼)	10–40	A1	36EUEP5NE		60	37EUEP5NED		60A/600V	37EUEP5NEF		50	37EUEP5NEP	
	40	2	13–52	B	36FUF5NE		60	37FUF5NED		60A/600V	37FUF5NEF		50	37FUF5NEP	
	60	(2½)	25–100	B	36GUGP5NE		100	37GUGP5NED		100A/600V	37GUGP5NEF		100	37GUGP5NEP	
	75	3	25–100	B	36HUGP5NE		200	37HUGP5NED		200A/600V	37HUGP5NEF		125	37HUGP5NEP	
	100	(3½)	50–200	B	36IUHP5NE		400	37IUHP5NED		400A/600V	37IUHP5NEF		150	37IUHP5NEP	
	150	4	50–200	B	36JUHP5NE		400	37JUHP5NED		400A/600V	37JUHP5NEF		250	37JUHP5NEP	
	250	5	55–250	—	—		—	—		400A/600V	37LSP5NEF		—	—	
350	5	55–250	—	—	36LPUP5NE		600	37LPUP5NED		600A/600V	37LPUP5NEF		400	37LPUP5NEP	
600	6	160–630	—	—	36MPXP5NE		1200	37MPXP5NED		1200A/600V	37MPXP5NEF		1200	37MPXP5NEP	

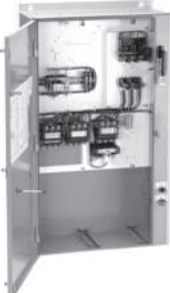
Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① See page 9/110 for conduit hubs and conversion instructions.

Reduced Voltage Heavy Duty Starters

Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/182. ► Replacement Parts see page 9/131. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 1 General Purpose Enclosures


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06BD		60	37DUE06BDD		60A/250V	37DUE06BDF		50	37DUE06BDP	
	15	(1¼)	10-40	A1	36EUE06BD		100	37EUE06BDD		100A/250V	37EUE06BDF		100	37EUE06BDP	
	20	2	13-52	B	36FUF06BD		100	37FUF06BDD		100A/250V	37FUF06BDF		100	37FUF06BDP	
	30	(2½)	25-100	B	36GUG06BD		200	37GUG06BDD		200A/250V	37GUG06BDF		125	37GUG06BDP	
	40	3	25-100	B	36HUG06BD		200	37HUG06BDD		200A/250V	37HUG06BDF		150	37HUG06BDP	
	50	(3½)	50-200	B	36IUH06BD		200	37IUH06BDD		200A/250V	37IUH06BDF		250	37IUH06BDP	
	60	4	50-200	B	36JUH06BD		400	37JUH06BDD		400A/250V	37JUH06BDF		250	37JUH06BDP	
	75	5	55-250	—	36LPS06BD		400	37LPS06BDD		400A/250V	37LPS06BDF		400	37LPS06BDP	
	150	5	55-250	—	36LPU06BD		600	37LPU06BDD		600A/250V	37LPU06BDF		600	37LPU06BDP	
	300	6	160-630	—	36MPX06BD		1200	37MPX06BDD		1200A/250V	37MPX06BDF		1200	37MPX06BDP	
230	10	1	10-40	A1	36DUE02BG		60	37DUE02BGD		60A/250V	37DUE02BGF		50	37DUE02BGP	
	15	(1¼)	10-40	A1	36EUE02BG		60	37EUE02BGD		60A/250V	37EUE02BGF		50	37EUE02BGP	
	25	2	13-52	B	36FUF02BG		100	37FUF02BGD		100A/250V	37FUF02BGF		100	37FUF02BGP	
	30	(2½)	25-100	B	36GUG02BG		200	37GUG02BGD		200A/250V	37GUG02BGF		100	37GUG02BGP	
	50	3	25-100	B	36HUG02BG		200	37HUG02BGD		200A/250V	37HUG02BGF		150	37HUG02BGP	
	60	(3½)	50-200	B	36IUH02BG		200	37IUH02BGD		200A/250V	37IUH02BGF		250	37IUH02BGP	
	75	4	50-200	B	36JUH02BG		400	37JUH02BGD		400A/250V	37JUH02BGF		250	37JUH02BGP	
	100	5	55-250	—	36LPS02BG		400	37LPS02BGD		400A/250V	37LPS02BGF		400	37LPS02BGP	
	150	5	55-250	—	36LPU02BG		600	37LPU02BGD		600A/250V	37LPU02BGF		600	37LPU02BGP	
	350	6	160-630	—	36MPX02BG		1200	37MPX02BGD		1200A/250V	37MPX02BGF		1200	37MPX02BGP	
460	15	1	5.5-22	A1	36DUD04BH		30	37DUD04BHD		30A/600V	37DUD04BHF		30	37DUD04BHP	
	30	(1¼)	10-40	A1	36EUE04BH		60	37EUE04BHD		60A/600V	37EUE04BHF		50	37EUE04BHP	
	40	2	13-52	B	36FUF04BH		100	37FUF04BHD		100A/600V	37FUF04BHF		100	37FUF04BHP	
	60	(2½)	25-100	B	36GUG04BH		200	37GUG04BHD		200A/600V	37GUG04BHF		100	37GUG04BHP	
	75	3	25-100	B	36HUG04BH		200	37HUG04BHD		200A/600V	37HUG04BHF		125	37HUG04BHP	
	100	(3½)	50-200	B	36IUH04BH		200	37IUH04BHD		200A/600V	37IUH04BHF		150	37IUH04BHP	
	150	4	50-200	B	36JUH04BH		400	37JUH04BHD		400A/600V	37JUH04BHF		250	37JUH04BHP	
	200	5	55-250	—	36LPS04BH		400	37LPS04BHD		400A/600V	37LPS04BHF		400	37LPS04BHP	
	300	5	55-250	—	36LPU04BH		600	37LPU04BHD		600A/600V	37LPU04BHF		600	37LPU04BHP	
	700	6	160-630	—	36MPX04BH		1600	37MPX04BHD		1600A/600V	37MPX04BHF		1200	37MPX04BHP	
575	15	1	5.5-22	A1	36DUD05BE		30	37DUD05BED		30A/600V	37DUD05BEF		30	37DUD05BEP	
	30	(1¼)	10-40	A1	36EUE05BE		60	37EUE05BED		60A/600V	37EUE05BEF		50	37EUE05BEP	
	40	2	13-52	B	36FUF05BE		100	37FUF05BED		100A/600V	37FUF05BEF		50	37FUF05BEP	
	60	(2½)	25-100	B	36GUG05BE		100	37GUG05BED		100A/600V	37GUG05BEF		100	37GUG05BEP	
	75	3	25-100	B	36HUG05BE		200	37HUG05BED		200A/600V	37HUG05BEF		125	37HUG05BEP	
	100	(3½)	50-200	B	36IUH05BE		200	37IUH05BED		200A/600V	37IUH05BEF		150	37IUH05BEP	
	150	4	50-200	B	36JUH05BE		400	37JUH05BED		400A/600V	37JUH05BEF		250	37JUH05BEP	
	200	5	55-250	—	36LPS05BE		400	37LPS05BED		400A/600V	37LPS05BEF		250	37LPS05BEP	
	300	5	55-250	—	36LPU05BE		600	37LPU05BED		600A/600V	37LPU05BEF		400	37LPU05BEP	
	700	6	160-630	—	36MPX05BE		1600	37MPX05BED		1600A/600V	37MPX05BEF		1600	37MPX05BEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/182. ► Replacement Parts see page 9/131. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 4 Painted Enclosures

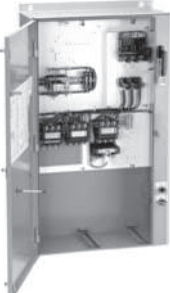
Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06ED		60	37DUE06EDD		60A/250V	37DUE06EDF		50	37DUE06EDP	
	15	(1¼)	10-40	A1	36EUE06ED		100	37EUE06EDD		100A/250V	37EUE06EDF		100	37EUE06EDP	
	20	2	13-52	B	36FUF06ED		100	37FUF06EDD		100A/250V	37FUF06EDF		100	37FUF06EDP	
	30	(2½)	25-100	B	36GUG06ED		200	37GUG06EDD		200A/250V	37GUG06EDF		125	37GUG06EDP	
	40	3	25-100	B	36HUG06ED		200	37HUG06EDD		200A/250V	37HUG06EDF		150	37HUG06EDP	
	50	(3½)	50-200	B	36IUH06ED		200	37IUH06EDD		200A/250V	37IUH06EDF		250	37IUH06EDP	
	60	4	50-200	B	36JUH06ED		400	37JUH06EDD		400A/250V	37JUH06EDF		250	37JUH06EDP	
	75	5	55-250	—	36LPS06ED		400	37LPS06EDD		400A/250V	37LPS06EDF		400	37LPS06EDP	
	150	5	55-250	—	36LPU06ED		600	37LPU06EDD		600A/250V	37LPU06EDF		600	37LPU06EDP	
	300	6	160-630	—	36MPX06ED		1200	37MPX06EDD		1200A/250V	37MPX06EDF		1200	37MPX06EDP	
230	10	1	10-40	A1	36DUE02EG		60	37DUE02EGD		60A/250V	37DUE02EGF		50	37DUE02EGP	
	15	(1¼)	10-40	A1	36EUE02EG		60	37EUE02EGD		60A/250V	37EUE02EGF		50	37EUE02EGP	
	25	2	13-52	B	36FUF02EG		100	37FUF02EGD		100A/250V	37FUF02EGF		100	37FUF02EGP	
	30	(2½)	25-100	B	36GUG02EG		200	37GUG02EGD		200A/250V	37GUG02EGF		100	37GUG02EGP	
	50	3	25-100	B	36HUG02EG		200	37HUG02EGD		200A/250V	37HUG02EGF		150	37HUG02EGP	
	60	(3½)	50-200	B	36IUH02EG		200	37IUH02EGD		200A/250V	37IUH02EGF		250	37IUH02EGP	
	75	4	50-200	B	36JUH02EG		400	37JUH02EGD		400A/250V	37JUH02EGF		250	37JUH02EGP	
	100	5	55-250	—	36LPS02EG		400	37LPS02EGD		400A/250V	37LPS02EGF		400	37LPS02EGP	
	150	5	55-250	—	36LPU02EG		600	37LPU02EGD		600A/250V	37LPU02EGF		600	37LPU02EGP	
	350	6	160-630	—	36MPX02EG		1200	37MPX02EGD		1200A/250V	37MPX02EGF		1200	37MPX02EGP	
460	15	1	5.5-22	A1	36DUD04EH		30	37DUD04EHD		30A/600V	37DUD04EHF		30	37DUD04EHP	
	30	(1¼)	10-40	A1	36EUE04EH		60	37EUE04EHD		60A/600V	37EUE04EHF		50	37EUE04EHP	
	40	2	13-52	B	36FUF04EH		100	37FUF04EHD		100A/600V	37FUF04EHF		100	37FUF04EHP	
	60	(2½)	25-100	B	36GUG04EH		200	37GUG04EHD		200A/600V	37GUG04EHF		100	37GUG04EHP	
	75	3	25-100	B	36HUG04EH		200	37HUG04EHD		200A/600V	37HUG04EHF		125	37HUG04EHP	
	100	(3½)	50-200	B	36IUH04EH		200	37IUH04EHD		200A/600V	37IUH04EHF		150	37IUH04EHP	
	150	4	50-200	B	36JUH04EH		400	37JUH04EHD		400A/600V	37JUH04EHF		250	37JUH04EHP	
	200	5	55-250	—	36LPS04EH		400	37LPS04EHD		400A/600V	37LPS04EHF		400	37LPS04EHP	
	300	5	55-250	—	36LPU04EH		600	37LPU04EHD		600A/600V	37LPU04EHF		600	37LPU04EHP	
	700	6	160-630	—	36MPX04EH		1600	37MPX04EHD		1600A/600V	37MPX04EHF		1200	37MPX04EHP	
575	15	1	5.5-22	A1	36DUD05EE		30	37DUD05EED		30A/600V	37DUD05EEF		30	37DUD05EEP	
	30	(1¼)	10-40	A1	36EUE05EE		60	37EUE05EED		60A/600V	37EUE05EEF		50	37EUE05EEP	
	40	2	13-52	B	36FUF05EE		100	37FUF05EED		100A/600V	37FUF05EEF		50	37FUF05EEP	
	60	(2½)	25-100	B	36GUG05EE		100	37GUG05EED		100A/600V	37GUG05EEF		100	37GUG05EEP	
	75	3	25-100	B	36HUG05EE		200	37HUG05EED		200A/600V	37HUG05EEF		125	37HUG05EEP	
	100	(3½)	50-200	B	36IUH05EE		200	37IUH05EED		200A/600V	37IUH05EEF		150	37IUH05EEP	
	150	4	50-200	B	36JUH05EE		400	37JUH05EED		400A/600V	37JUH05EEF		250	37JUH05EEP	
	200	5	55-250	—	36LPS05EE		400	37LPS05EED		400A/600V	37LPS05EEF		250	37LPS05EEP	
	300	5	55-250	—	36LPU05EE		600	37LPU05EED		600A/600V	37LPU05EEF		400	37LPU05EEP	
	700	6	160-630	—	37MPX05EF		1600	37MPX05EED		1600A/600V	37MPX05EEF		1600	37MPX05EEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

Selection

	Ordering Information <ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/182. ► Replacement Parts see page 9/131. 	Coil and Control Voltage <p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>
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NEMA 4/4X Stainless Steel Enclosures


Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06WD		60	37DUE06WDD		60A/250V	37DUE06WDF		50	37DUE06WDP	
	15	(1¼)	10-40	A1	36EUE06WD		100	37EUE06WDD		100A/250V	37EUE06WDF		100	37EUE06WDP	
	20	2	13-52	B	36FUF06WD		100	37FUF06WDD		100A/250V	37FUF06WDF		100	37FUF06WDP	
	30	(2½)	25-100	B	36GUG06WD		200	37GUG06WDD		200A/250V	37GUG06WDF		125	37GUG06WDP	
	40	3	25-100	B	36HUG06WD		200	37HUG06WDD		200A/250V	37HUG06WDF		150	37HUG06WDP	
	50	(3½)	50-200	B	36IUH06WD		200	37IUH06WDD		200A/250V	37IUH06WDF		250	37IUH06WDP	
	60	4	50-200	B	36JUH06WD		400	37JUH06WDD		400A/250V	37JUH06WDF		250	37JUH06WDP	
230	10	1	10-40	A1	36DUE02WG		60	37DUE02WGD		60A/250V	37DUE02WGF		50	37DUE02WGP	
	15	(1¼)	10-40	A1	36EUE02WG		60	37EUE02WGD		60A/250V	37EUE02WGF		50	37EUE02WGP	
	25	2	13-52	B	36FUF02WG		100	37FUF02WGD		100A/250V	37FUF02WGF		100	37FUF02WGP	
	30	(2½)	25-100	B	36GUG02WG		200	37GUG02WGD		200A/250V	37GUG02WGF		100	37GUG02WGP	
	50	3	25-100	B	36HUG02WG		200	37HUG02WGD		200A/250V	37HUG02WGF		150	37HUG02WGP	
	60	(3½)	50-200	B	36IUH02WG		200	37IUH02WGD		200A/250V	37IUH02WGF		250	37IUH02WGP	
	75	4	50-200	B	36JUH02WG		400	37JUH02WGD		400A/250V	37JUH02WGF		250	37JUH02WGP	
460	15	1	5.5-22	A1	36DUD04WH		30	37DUD04WHD		30A/600V	37DUD04WHF		30	37DUD04WHP	
	30	(1¼)	10-40	A1	36EUE04WH		60	37EUE04WHD		60A/600V	37EUE04WHF		50	37EUE04WHP	
	40	2	13-52	B	36FUF04WH		100	37FUF04WHD		100A/600V	37FUF04WHF		100	37FUF04WHP	
	60	(2½)	25-100	B	36GUG04WH		200	37GUG04WHD		200A/600V	37GUG04WHF		100	37GUG04WHP	
	75	3	25-100	B	36HUG04WH		200	37HUG04WHD		200A/600V	37HUG04WHF		125	37HUG04WHP	
	100	(3½)	50-200	B	36IUH04WH		200	37IUH04WHD		200A/600V	37IUH04WHF		150	37IUH04WHP	
	150	4	50-200	B	36JUH04WH		400	37JUH04WHD		400A/600V	37JUH04WHF		250	37JUH04WHP	
575	15	1	5.5-22	A1	36DUD05WE		30	37DUD05WED		30A/600V	37DUD05WEF		30	37DUD05WEP	
	30	(1¼)	10-40	A1	36EUE05WE		60	37EUE05WED		60A/600V	37EUE05WEF		50	37EUE05WEP	
	40	2	13-52	B	36FUF05WE		100	37FUF05WED		100A/600V	37FUF05WEF		50	37FUF05WEP	
	60	(2½)	25-100	B	36GUG05WE		100	37GUG05WED		100A/600V	37GUG05WEF		100	37GUG05WEP	
	75	3	25-100	B	36HUG05WE		200	37HUG05WED		200A/600V	37HUG05WEF		125	37HUG05WEP	
	100	(3½)	50-200	B	36IUH05WE		200	37IUH05WED		200A/600V	37IUH05WEF		150	37IUH05WEP	
	150	4	50-200	B	36JUH05WE		400	37JUH05WED		400A/600V	37JUH05WEF		250	37JUH05WEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Wye Delta, Open Transition with Solid State Overload, Class 36 & 37

Selection

	Ordering Information	Coil and Control Voltage
	<ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/182. ► Replacement Parts see page 9/131. 	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 12 Enclosures (Supplied as NEMA 12, field convertible to 3/3R)^①

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUE06ND		60	37DUE06NDD		60A/250V	37DUE06NDF		50	37DUE06NDP	
	15	(1¼)	10-40	A1	36EUE06ND		100	37EUE06NDD		100A/250V	37EUE06NDF		100	37EUE06NDP	
	20	2	13-52	B	36FUF06ND		100	37FUF06NDD		100A/250V	37FUF06NDF		100	37FUF06NDP	
	30	(2½)	25-100	B	36GUG06ND		200	37GUG06NDD		200A/250V	37GUG06NDF		125	37GUG06NDP	
	40	3	25-100	B	36HUG06ND		200	37HUG06NDD		200A/250V	37HUG06NDF		150	37HUG06NDP	
	50	(3½)	50-200	B	36IUH06ND		200	37IUH06NDD		200A/250V	37IUH06NDF		250	37IUH06NDP	
	60	4	50-200	B	36JUH06ND		400	37JUH06NDD		400A/250V	37JUH06NDF		250	37JUH06NDP	
	75	5	55-250	—	36LPS06ND		400	37LPS06NDD		400A/250V	37LPS06NDF		400	37LPS06NDP	
	150	5	55-250	—	36LPU06ND		600	37LPU06NDD		600A/250V	37LPU06NDF		600	37LPU06NDP	
	300	6	160-630	—	36MPX06ND		1200	37MPX06NDD		1200A/250V	37MPX06NDF		1200	37MPX06NDP	
230	10	1	10-40	A1	36DUE02NG		60	37DUE02NGD		60A/250V	37DUE02NGF		50	37DUE02NGP	
	15	(1¼)	10-40	A1	36EUE02NG		60	37EUE02NGD		60A/250V	37EUE02NGF		50	37EUE02NGP	
	25	2	13-52	B	36FUF02NG		100	37FUF02NGD		100A/250V	37FUF02NGF		100	37FUF02NGP	
	30	(2½)	25-100	B	36GUG02NG		200	37GUG02NGD		200A/250V	37GUG02NGF		100	37GUG02NGP	
	50	3	25-100	B	36HUG02NG		200	37HUG02NGD		200A/250V	37HUG02NGF		150	37HUG02NGP	
	60	(3½)	50-200	B	36IUH02NG		200	37IUH02NGD		200A/250V	37IUH02NGF		250	37IUH02NGP	
	75	4	50-200	B	36JUH02NG		400	37JUH02NGD		400A/250V	37JUH02NGF		250	37JUH02NGP	
	100	5	55-250	—	36LPS02NG		400	37LPS02NGD		400A/250V	37LPS02NGF		400	37LPS02NGP	
	150	5	55-250	—	36LPU02NG		600	37LPU02NGD		600A/250V	37LPU02NGF		600	37LPU02NGP	
	350	6	160-630	—	36MPX02NG		1200	37MPX02NGD		1200A/250V	37MPX02NGF		1200	37MPX02NGP	
460	15	1	5.5-22	A1	36DUD04NH		30	37DUD04NHD		30A/600V	37DUD04NHF		30	37DUD04NHP	
	30	(1¼)	10-40	A1	36EUE04NH		60	37EUE04NHD		60A/600V	37EUE04NHF		50	37EUE04NHP	
	40	2	13-52	B	36FUF04NH		100	37FUF04NHD		100A/600V	37FUF04NHF		100	37FUF04NHP	
	60	(2½)	25-100	B	36GUG04NH		200	37GUG04NHD		200A/600V	37GUG04NHF		100	37GUG04NHP	
	75	3	25-100	B	36HUG04NH		200	37HUG04NHD		200A/600V	37HUG04NHF		125	37HUG04NHP	
	100	(3½)	50-200	B	36IUH04NH		200	37IUH04NHD		200A/600V	37IUH04NHF		150	37IUH04NHP	
	150	4	50-200	B	36JUH04NH		400	37JUH04NHD		400A/600V	37JUH04NHF		250	37JUH04NHP	
	200	5	55-250	—	36LPS04NH		400	37LPS04NHD		400A/600V	37LPS04NHF		400	37LPS04NHP	
	300	5	55-250	—	36LPU04NH		600	37LPU04NHD		600A/600V	37LPU04NHF		600	37LPU04NHP	
	700	6	160-630	—	36MPX04NH		1600	37MPX04NHD		1600A/600V	37MPX04NHF		1200	37MPX04NHP	
575	15	1	5.5-22	A1	36DUD05NE		30	37DUD05NED		30A/600V	37DUD05NEF		30	37DUD05NEP	
	30	(1¼)	10-40	A1	36EUE05NE		60	37EUE05NED		60A/600V	37EUE05NEF		50	37EUE05NEP	
	40	2	13-52	B	36FUF05NE		100	37FUF05NED		100A/600V	37FUF05NEF		50	37FUF05NEP	
	60	(2½)	25-100	B	36GUG05NE		100	37GUG05NED		100A/600V	37GUG05NEF		100	37GUG05NEP	
	75	3	25-100	B	36HUG05NE		200	37HUG05NED		200A/600V	37HUG05NEF		125	37HUG05NEP	
	100	(3½)	50-200	B	36IUH05NE		200	37IUH05NED		200A/600V	37IUH05NEF		150	37IUH05NEP	
	150	4	50-200	B	36JUH05NE		400	37JUH05NED		400A/600V	37JUH05NEF		250	37JUH05NEP	
	200	5	55-250	—	36LPS05NE		400	37LPS05NED		400A/600V	37LPS05NEF		250	37LPS05NEP	
	300	5	55-250	—	36LPU05NE		600	37LPU05NED		600A/600V	37LPU05NEF		400	37LPU05NEP	
	700	6	160-630	—	37MPX05NF		1600	37MPX05NED		1600A/600V	37MPX05NEF		1600	37MPX05NEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① See page 9/110 for conduit hubs and conversion instructions.

Reduced Voltage Heavy Duty Starters

Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/183. ► Replacement Parts see page 9/131. 	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 1 General Purpose Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUEC6BD		60	37DUEC6BDD		60A/250V	37DUEC6BDF		50	37DUEC6BDP	
	15	(1¼)	10-40	A1	36EUEC6BD		100	37EUEC6BDD		100A/250V	37EUEC6BDF		100	37EUEC6BDP	
	20	2	13-52	B	36FUEC6BD		100	37FUEC6BDD		100A/250V	37FUEC6BDF		100	37FUEC6BDP	
	30	(2½)	25-100	B	36GUEC6BD		200	37GUEC6BDD		200A/250V	37GUEC6BDF		125	37GUEC6BDP	
	40	3	25-100	B	36HUEC6BD		200	37HUEC6BDD		200A/250V	37HUEC6BDF		150	37HUEC6BDP	
	50	(3½)	50-200	B	36IUHC6BD		200	37IUHC6BDD		200A/250V	37IUHC6BDF		250	37IUHC6BDP	
	60	4	50-200	B	36JUHC6BD		400	37JUHC6BDD		400A/250V	37JUHC6BDF		250	37JUHC6BDP	
	75	5	55-250	—	36LPSC6BD		400	37LPSC6BDD		400A/250V	37LPSC6BDF		400	37LPSC6BDP	
230	150	5	55-250	—	36LPUC6BD		600	37LPUC6BDD		600A/250V	37LPUC6BDF		600	37LPUC6BDP	
	300	6	160-630	—	36MPXC6BD		1200	37MPXC6BDD		1200A/250V	37MPXC6BDF		1200	37MPXC6BDP	
	10	1	10-40	A1	36DUEC2BG		60	37DUEC2BGD		60A/250V	37DUEC2BGF		50	37DUEC2BGP	
	15	(1¼)	10-40	A1	36EUEC2BG		60	37EUEC2BGD		60A/250V	37EUEC2BGF		50	37EUEC2BGP	
	25	2	13-52	B	36FUEC2BG		100	37FUEC2BGD		100A/250V	37FUEC2BGF		100	37FUEC2BGP	
	30	(2½)	25-100	B	36GUEC2BG		200	37GUEC2BGD		200A/250V	37GUEC2BGF		100	37GUEC2BGP	
	50	3	25-100	B	36HUEC2BG		200	37HUEC2BGD		200A/250V	37HUEC2BGF		150	37HUEC2BGP	
	60	(3½)	50-200	B	36IUHC2BG		200	37IUHC2BGD		200A/250V	37IUHC2BGF		250	37IUHC2BGP	
460	75	4	50-200	B	36JUHC2BG		400	37JUHC2BGD		400A/250V	37JUHC2BGF		250	37JUHC2BGP	
	100	5	55-250	—	36LPSC2BG		400	37LPSC2BGD		400A/250V	37LPSC2BGF		400	37LPSC2BGP	
	150	5	55-250	—	36LPUC2BG		600	37LPUC2BGD		600A/250V	37LPUC2BGF		600	37LPUC2BGP	
	350	6	160-630	—	36MPXC2BG		1200	37MPXC2BGD		1200A/250V	37MPXC2BGF		1200	37MPXC2BGP	
	15	1	5.5-22	A1	36DUDC4BH		30	37DUDC4BHD		30A/600V	37DUDC4BHF		30	37DUDC4BHP	
	30	(1¼)	10-40	A1	36EUEC4BH		60	37EUEC4BHD		60A/600V	37EUEC4BHF		50	37EUEC4BHP	
	40	2	13-52	B	36FUEC4BH		100	37FUEC4BHD		100A/600V	37FUEC4BHF		100	37FUEC4BHP	
	60	(2½)	25-100	B	36GUEC4BH		200	37GUEC4BHD		200A/600V	37GUEC4BHF		100	37GUEC4BHP	
575	75	3	25-100	B	36HUEC4BH		200	37HUEC4BHD		200A/600V	37HUEC4BHF		125	37HUEC4BHP	
	100	(3½)	50-200	B	36IUHC4BH		200	37IUHC4BHD		200A/600V	37IUHC4BHF		150	37IUHC4BHP	
	150	4	50-200	B	36JUHC4BH		400	37JUHC4BHD		400A/600V	37JUHC4BHF		250	37JUHC4BHP	
	200	5	55-250	—	36LPSC4BH		400	37LPSC4BHD		400A/600V	37LPSC4BHF		400	37LPSC4BHP	
	300	5	55-250	—	36LPUC4BH		600	37LPUC4BHD		600A/600V	37LPUC4BHF		600	37LPUC4BHP	
	700	6	160-630	—	36MPXC4BH		1600	37MPXC4BHD		1600A/600V	37MPXC4BHF		1200	37MPXC4BHP	
	15	1	5.5-22	A1	36DUDC5BE		30	37DUDC5BED		30A/600V	37DUDC5BEF		30	37DUDC5BEP	
	30	(1¼)	10-40	A1	36EUEC5BE		60	37EUEC5BED		60A/600V	37EUEC5BEF		50	37EUEC5BEP	
575	40	2	13-52	B	36FUEC5BE		100	37FUEC5BED		100A/600V	37FUEC5BEF		50	37FUEC5BEP	
	60	(2½)	25-100	B	36GUEC5BE		100	37GUEC5BED		100A/600V	37GUEC5BEF		100	37GUEC5BEP	
	75	3	25-100	B	36HUEC5BE		200	37HUEC5BED		200A/600V	37HUEC5BEF		125	37HUEC5BEP	
	100	(3½)	50-200	B	36IUHC5BE		200	37IUHC5BED		200A/600V	37IUHC5BEF		150	37IUHC5BEP	
	150	4	50-200	B	36JUHC5BE		400	37JUHC5BED		400A/600V	37JUHC5BEF		250	37JUHC5BEP	
	200	5	55-250	—	36LPSC5BE		400	37LPSC5BED		400A/600V	37LPSC5BEF		250	37LPSC5BEP	
	300	5	55-250	—	36LPUC5BE		600	37LPUC5BED		600A/600V	37LPUC5BEF		400	37LPUC5BEP	
	700	6	160-630	—	37MPXC5BF		1600	37MPXC5BED		1600A/600V	37MPXC5BEF		1600	37MPXC5BEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> Field Modification Kits see page 9/104. Factory Modifications see page 9/119. Dimensions see page 9/167. Wiring Diagrams see page 9/183. Replacement Parts see page 9/131. 	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 4 Painted Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUEC6ED		60	37DUEC6EDD		60A/250V	37DUEC6EDF		50	37DUEC6EDP	
	15	(1¼)	10-40	A1	36EUEC6ED		100	37EUEC6EDD		100A/250V	37EUEC6EDF		100	37EUEC6EDP	
	20	2	13-52	B	36FUTC6ED		100	37FUTC6EDD		100A/250V	37FUTC6EDF		100	37FUTC6EDP	
	30	(2½)	25-100	B	36GUGC6ED		200	37GUGC6EDD		200A/250V	37GUGC6EDF		125	37GUGC6EDP	
	40	3	25-100	B	36HUGC6ED		200	37HUGC6EDD		200A/250V	37HUGC6EDF		150	37HUGC6EDP	
	50	(3½)	50-200	B	36IUHC6ED		200	37IUHC6EDD		200A/250V	37IUHC6EDF		250	37IUHC6EDP	
	60	4	50-200	B	36JUHC6ED		400	37JUHC6EDD		400A/250V	37JUHC6EDF		250	37JUHC6EDP	
	75	5	55-250	—	36LPSC6ED		400	37LPSC6EDD		400A/250V	37LPSC6EDF		400	37LPSC6EDP	
	150	5	55-250	—	36LPUC6ED		600	37LPUC6EDD		600A/250V	37LPUC6EDF		600	37LPUC6EDP	
230	300	6	160-630	—	36MPXC6ED		1200	37MPXC6EDD		1200A/250V	37MPXC6EDF		1200	37MPXC6EDP	
	10	1	10-40	A1	36DUEC2EG		60	37DUEC2EGD		60A/250V	37DUEC2EGF		50	37DUEC2EGP	
	15	(1¼)	10-40	A1	36EUEC2EG		60	37EUEC2EGD		60A/250V	37EUEC2EGF		50	37EUEC2EGP	
	25	2	13-52	B	36FUTC2EG		100	37FUTC2EGD		100A/250V	37FUTC2EGF		100	37FUTC2EGP	
	30	(2½)	25-100	B	36GUGC2EG		200	37GUGC2EGD		200A/250V	37GUGC2EGF		100	37GUGC2EGP	
	50	3	25-100	B	36HUGC2EG		200	37HUGC2EGD		200A/250V	37HUGC2EGF		150	37HUGC2EGP	
	60	(3½)	50-200	B	36IUHC2EG		200	37IUHC2EGD		200A/250V	37IUHC2EGF		250	37IUHC2EGP	
	75	4	50-200	B	36JUHC2EG		400	37JUHC2EGD		400A/250V	37JUHC2EGF		250	37JUHC2EGP	
	100	5	55-250	—	36LPSC2EG		400	37LPSC2EGD		400A/250V	37LPSC2EGF		400	37LPSC2EGP	
460	150	5	55-250	—	36LPUC2EG		600	37LPUC2EGD		600A/250V	37LPUC2EGF		600	37LPUC2EGP	
	350	6	160-630	—	36MPXC2EG		1200	37MPXC2EGD		1200A/250V	37MPXC2EGF		1200	37MPXC2EGP	
	15	1	5.5-22	A1	36DUDC4EH		30	37DUDC4EHD		30A/600V	37DUDC4EHF		30	37DUDC4EHP	
	30	(1¼)	10-40	A1	36EUEC4EH		60	37EUEC4EHD		60A/600V	37EUEC4EHF		50	37EUEC4EHP	
	40	2	13-52	B	36FUTC4EH		100	37FUTC4EHD		100A/600V	37FUTC4EHF		100	37FUTC4EHP	
	60	(2½)	25-100	B	36GUGC4EH		200	37GUGC4EHD		200A/600V	37GUGC4EHF		100	37GUGC4EHP	
	75	3	25-100	B	36HUGC4EH		200	37HUGC4EHD		200A/600V	37HUGC4EHF		125	37HUGC4EHP	
	100	(3½)	50-200	B	36IUHC4EH		200	37IUHC4EHD		200A/600V	37IUHC4EHF		150	37IUHC4EHP	
	150	4	50-200	B	36JUHC4EH		400	37JUHC4EHD		400A/600V	37JUHC4EHF		250	37JUHC4EHP	
575	200	5	55-250	—	36LPSC4EH		400	37LPSC4EHD		400A/600V	37LPSC4EHF		400	37LPSC4EHP	
	300	5	55-250	—	36LPUC4EH		600	37LPUC4EHD		600A/600V	37LPUC4EHF		600	37LPUC4EHP	
	700	6	160-630	—	36MPXC4EH		1600	37MPXC4EHD		1600A/600V	37MPXC4EHF		1200	37MPXC4EHP	
	15	1	5.5-22	A1	36DUDC5EE		30	37DUDC5EED		30A/600V	37DUDC5EEF		30	37DUDC5EEP	
	30	(1¼)	10-40	A1	36EUEC5EE		60	37EUEC5EED		60A/600V	37EUEC5EEF		50	37EUEC5EEP	
	40	2	13-52	B	36FUTC5EE		100	37FUTC5EED		100A/600V	37FUTC5EEF		50	37FUTC5EEP	
	60	(2½)	25-100	B	36GUGC5EE		100	37GUGC5EED		100A/600V	37GUGC5EEF		100	37GUGC5EEP	
	75	3	25-100	B	36HUGC5EE		200	37HUGC5EED		200A/600V	37HUGC5EEF		125	37HUGC5EEP	
	100	(3½)	50-200	B	36IUHC5EE		200	37IUHC5EED		200A/600V	37IUHC5EEF		150	37IUHC5EEP	
	150	4	50-200	B	36JUHC5EE		400	37JUHC5EED		400A/600V	37JUHC5EEF		250	37JUHC5EEP	
	200	5	55-250	—	36LPSC5EE		400	37LPSC5EED		400A/600V	37LPSC5EEF		250	37LPSC5EEP	
	300	5	55-250	—	36LPUC5EE		600	37LPUC5EED		600A/600V	37LPUC5EEF		400	37LPUC5EEP	
	700	6	160-630	—	37MPXC5EF		1600	37MPXC5EED		1600A/600V	37MPXC5EEF		1600	37MPXC5EEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/183. ► Replacement Parts see page 9/131. 	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 4/4X Stainless Steel Enclosures

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10-40	A1	36DUEC6WD		60	37DUEC6WDD		60A/250V	37DUEC6WDF		50	37DUEC6WDP	
	15	(1¼)	10-40	A1	36EUEC6WD		100	37EUEC6WDD		100A/250V	37EUEC6WDF		100	37EUEC6WDP	
	20	2	13-52	B	36FUEC6WD		100	37FUEC6WDD		100A/250V	37FUEC6WDF		100	37FUEC6WDP	
	30	(2½)	25-100	B	36GUGC6WD		200	37GUGC6WDD		200A/250V	37GUGC6WDF		125	37GUGC6WDP	
	40	3	25-100	B	36HUGC6WD		200	37HUGC6WDD		200A/250V	37HUGC6WDF		150	37HUGC6WDP	
	50	(3½)	50-200	B	36IUHC6WD		200	37IUHC6WDD		200A/250V	37IUHC6WDF		250	37IUHC6WDP	
230	60	4	50-200	B	36JUHC6WD		400	37JUHC6WDD		400A/250V	37JUHC6WDF		250	37JUHC6WDP	
	10	1	10-40	A1	36DUEC2WG		60	37DUEC2WGD		60A/250V	37DUEC2WGF		50	37DUEC2WGP	
	15	(1¼)	10-40	A1	36EUEC2WG		60	37EUEC2WGD		60A/250V	37EUEC2WGF		50	37EUEC2WGP	
	25	2	13-52	B	36FUEC2WG		100	37FUEC2WGD		100A/250V	37FUEC2WGF		100	37FUEC2WGP	
	30	(2½)	25-100	B	36GUGC2WG		200	37GUGC2WGD		200A/250V	37GUGC2WGF		100	37GUGC2WGP	
	50	3	25-100	B	36HUGC2WG		200	37HUGC2WGD		200A/250V	37HUGC2WGF		150	37HUGC2WGP	
460	60	(3½)	50-200	B	36IUHC2WG		200	37IUHC2WGD		200A/250V	37IUHC2WGF		250	37IUHC2WGP	
	75	4	50-200	B	36JUHC2WG		400	37JUHC2WGD		400A/250V	37JUHC2WGF		250	37JUHC2WGP	
	15	1	5.5-22	A1	36DUDC4WH		30	37DUDC4WHD		30A/600V	37DUDC4WHF		30	37DUDC4WHP	
	30	(1¼)	10-40	A1	36EUEC4WH		60	37EUEC4WHD		60A/600V	37EUEC4WHF		50	37EUEC4WHP	
	40	2	13-52	B	36FUEC4WH		100	37FUEC4WHD		100A/600V	37FUEC4WHF		100	37FUEC4WHP	
	60	(2½)	25-100	B	36GUGC4WH		200	37GUGC4WHD		200A/600V	37GUGC4WHF		100	37GUGC4WHP	
575	75	3	25-100	B	36HUGC4WH		200	37HUGC4WHD		200A/600V	37HUGC4WHF		125	37HUGC4WHP	
	100	(3½)	50-200	B	36IUHC4WH		200	37IUHC4WHD		200A/600V	37IUHC4WHF		150	37IUHC4WHP	
	150	4	50-200	B	36JUHC4WH		400	37JUHC4WHD		400A/600V	37JUHC4WHF		250	37JUHC4WHP	
	15	1	5.5-22	A1	36DUDC5WE		30	37DUDC5WED		30A/600V	37DUDC5WEF		30	37DUDC5WEP	
	30	(1¼)	10-40	A1	36EUEC5WE		60	37EUEC5WED		60A/600V	37EUEC5WEF		50	37EUEC5WEP	
	40	2	13-52	B	36FUEC5WE		100	37FUEC5WED		100A/600V	37FUEC5WEF		50	37FUEC5WEP	
575	60	(2½)	25-100	B	36GUGC5WE		100	37GUGC5WED		100A/600V	37GUGC5WEF		100	37GUGC5WEP	
	75	3	25-100	B	36HUGC5WE		200	37HUGC5WED		200A/600V	37HUGC5WEF		125	37HUGC5WEP	
	100	(3½)	50-200	B	36IUHC5WE		200	37IUHC5WED		200A/600V	37IUHC5WEF		150	37IUHC5WEP	
	150	4	50-200	B	36JUHC5WE		400	37JUHC5WED		400A/600V	37JUHC5WEF		250	37JUHC5WEP	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Heavy Duty Starters

Wye Delta, Closed Transition with Solid State Overload, Class 36 & 37

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/167. ► Wiring Diagrams see page 9/183. ► Replacement Parts see page 9/131. 	<p>The coil voltage will always match the motor voltage. As standard, a CPT is supplied and 120V control voltage is utilized. To change to 120V voltage (CPT not supplied), change the 9th character to "F". To change to 24VAC voltage (CPT not supplied), change the 9th character to "J".</p>

NEMA 12 Enclosures (Supplied as NEMA 12, field convertible to 3/3R)^①

Motor Voltage	Max Hp	NEMA Size (1/2 Size)	Overload Relay		Non-Combination		Combination Non-Fusible Disconnect			Combination Fusible Disconnect			Combination Circuit Breaker		
			Amp Range	Frame Size	Catalog Number	List Price \$	Disc. Amp Rating	Catalog Number	List Price \$	Fuse Clip Amp/Volt Rating	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
200	10	1	10–40	A1	36DUEC6ND		60	37DUEC6NDD		60A/250V	37DUEC6NDF		50	37DUEC6NDP	
	15	(1¼)	10–40	A1	36EUEC6ND		100	37EUEC6NDD		100A/250V	37EUEC6NDF		100	37EUEC6NDP	
	20	2	13–52	B	36FUEC6ND		100	37FUEC6NDD		100A/250V	37FUEC6NDF		100	37FUEC6NDP	
	30	(2½)	25–100	B	36GUEC6ND		200	37GUEC6NDD		200A/250V	37GUEC6NDF		125	37GUEC6NDP	
	40	3	25–100	B	36HUEC6ND		200	37HUEC6NDD		200A/250V	37HUEC6NDF		150	37HUEC6NDP	
	50	(3½)	50–200	B	36IUEC6ND		200	37IUEC6NDD		200A/250V	37IUEC6NDF		250	37IUEC6NDP	
	60	4	50–200	B	36JUEC6ND		400	37JUEC6NDD		400A/250V	37JUEC6NDF		250	37JUEC6NDP	
	75	5	55–250	—	36LPEC6ND		400	37LPEC6NDD		400A/250V	37LPEC6NDF		400	37LPEC6NDP	
	150	5	55–250	—	36LPUC6ND		600	37LPUC6NDD		600A/250V	37LPUC6NDF		600	37LPUC6NDP	
230	300	6	160–630	—	36MPXC6ND		1200	37MPXC6NDD		1200A/250V	37MPXC6NDF		1200	37MPXC6NDP	
	10	1	10–40	A1	36DUEC2NG		60	37DUEC2NGD		60A/250V	37DUEC2NGF		50	37DUEC2NGP	
	15	(1¼)	10–40	A1	36EUEC2NG		60	37EUEC2NGD		60A/250V	37EUEC2NGF		50	37EUEC2NGP	
	25	2	13–52	B	36FUEC2NG		100	37FUEC2NGD		100A/250V	37FUEC2NGF		100	37FUEC2NGP	
	30	(2½)	25–100	B	36GUEC2NG		200	37GUEC2NGD		200A/250V	37GUEC2NGF		100	37GUEC2NGP	
	50	3	25–100	B	36HUEC2NG		200	37HUEC2NGD		200A/250V	37HUEC2NGF		150	37HUEC2NGP	
	60	(3½)	50–200	B	36IUEC2NG		200	37IUEC2NGD		200A/250V	37IUEC2NGF		250	37IUEC2NGP	
	75	4	50–200	B	36JUEC2NG		400	37JUEC2NGD		400A/250V	37JUEC2NGF		250	37JUEC2NGP	
	100	5	55–250	—	36LPEC2NG		400	37LPEC2NGD		400A/250V	37LPEC2NGF		400	37LPEC2NGP	
460	150	5	55–250	—	36LPUC2NG		600	37LPUC2NGD		600A/250V	37LPUC2NGF		600	37LPUC2NGP	
	350	6	160–630	—	36MPXC2NG		1200	37MPXC2NGD		1200A/250V	37MPXC2NGF		1200	37MPXC2NGP	
	15	1	5.5–22	A1	36DUDC4NH		30	37DUDC4NHD		30A/600V	37DUDC4NHF		30	37DUDC4NHP	
	30	(1¼)	10–40	A1	36EUEC4NH		60	37EUEC4NHD		60A/600V	37EUEC4NHF		50	37EUEC4NHP	
	40	2	13–52	B	36FUEC4NH		100	37FUEC4NHD		100A/600V	37FUEC4NHF		100	37FUEC4NHP	
	60	(2½)	25–100	B	36GUEC4NH		200	37GUEC4NHD		200A/600V	37GUEC4NHF		100	37GUEC4NHP	
	75	3	25–100	B	36HUEC4NH		200	37HUEC4NHD		200A/600V	37HUEC4NHF		125	37HUEC4NHP	
	100	(3½)	50–200	B	36IUEC4NH		200	37IUEC4NHD		200A/600V	37IUEC4NHF		150	37IUEC4NHP	
	150	4	50–200	B	36JUEC4NH		400	37JUEC4NHD		400A/600V	37JUEC4NHF		250	37JUEC4NHP	
575	200	5	55–250	—	36LPEC4NH		400	37LPEC4NHD		400A/600V	37LPEC4NHF		400	37LPEC4NHP	
	300	5	55–250	—	36LPUC4NH		600	37LPUC4NHD		600A/600V	37LPUC4NHF		600	37LPUC4NHP	
	700	6	160–630	—	36MPXC4NH		1600	37MPXC4NHD		1600A/600V	37MPXC4NHF		1200	37MPXC4NHP	
	15	1	5.5–22	A1	36DUDC5NE		30	37DUDC5NED		30A/600V	37DUDC5NEF		30	37DUDC5NEP	
	30	(1¼)	10–40	A1	36EUEC5NE		60	37EUEC5NED		60A/600V	37EUEC5NEF		50	37EUEC5NEP	
	40	2	13–52	B	36FUEC5NE		100	37FUEC5NED		100A/600V	37FUEC5NEF		50	37FUEC5NEP	
	60	(2½)	25–100	B	36GUEC5NE		100	37GUEC5NED		100A/600V	37GUEC5NEF		100	37GUEC5NEP	
	75	3	25–100	B	36HUEC5NE		200	37HUEC5NED		200A/600V	37HUEC5NEF		125	37HUEC5NEP	
	100	(3½)	50–200	B	36IUEC5NE		200	37IUEC5NED		200A/600V	37IUEC5NEF		150	37IUEC5NEP	
	150	4	50–200	B	36JUEC5NE		400	37JUEC5NED		400A/600V	37JUEC5NEF		250	37JUEC5NEP	
	200	5	55–250	—	36LPEC5NE		400	37LPEC5NED		400A/600V	37LPEC5NEF		250	37LPEC5NEP	
	300	5	55–250	—	36LPUC5NE		600	37LPUC5NED		600A/600V	37LPUC5NEF		400	37LPUC5NEP	
	700	6	160–630	—	37MPXC5NF		1600	37MPXC5NED		1600A/600V	37MPXC5NEF		1600	37MPXC5NEP	

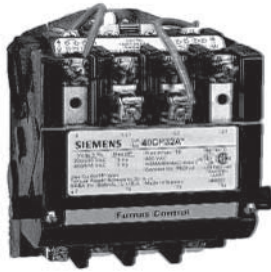
Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① See page 9/110 for conduit hubs and conversion instructions.

Heavy Duty Contactors

3-Phase, Class 40

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see pages 9/144 open and 9/157 enclosed.
- ▶ Wiring Diagrams see page 9/184.
- ▶ Replacement Parts see page 9/131.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 ^①	A
200–208	D
220–240	G
277	L
220–240/440–480 ^①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Contactor Amp Rating	NEMA Size	Half Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts				Open Type ^⑤		NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 ^② NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1½	1½	2	2	9	00	—	40BP32A*		40BP32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	40CP32A*		40CP32B*		40CP32W*		40CP32F*		40CP32H*		40CP32J*	
7½	7½	10	10	27	1	—	40DP32A*		40DP32B*		40DP32W*		40DP32F*		40DP32H*		40DP32J*	
10	10	15	15	40	—	1¼	40EP32A*		40EP32B*		40EP32W*		40EP32F*		40EP32H*		40EP32J*	
10	15	25	25	45	2	—	40FP32A*		40FP32B*		40FP32W*		40FP32F*		40FP32H*		40FP32J*	
15	20	30	30	60	—	2½	40GP32A*		40GP32B*		40GP32W*		40GP32F*		40GP32H*		40GP32J*	
25	30	50	50	90	3	—	40HP32A*		40HP32B*		40HP32W*		40HP32F*		40HP32H*		40HP32J*	
30	40	75	75	115	—	3½	40IP32A*		40IP32B*		40IP32W*		40IP32F*		40IP32H*		40IP32J*	
40	50	100	100	135	4	—	40JG32A*		40JG32B*		40JG32W*		40JG32F*		40JG32H*		40JG32J*	
75	100	200	200	270	5	—	40LP32A*		40LP32B*		40LP32E* ^③		—	—	40LP32H*		40LP32J*	
150	200	400	400	540	6	—	40MP32A*		40MP32B*		40MP32E* ^③		—	—	—	—	40MP32J*	
—	300	600	600	810	7④⑦	—	40NH32A*		40NH32B*		40NH32E* ^③		—	—	—	—	40NH32J*	
—	450	900	900	1215	8⑤⑦	—	40PH32A*		40PH32B*		40PH32E* ^③		—	—	—	—	40PH32J*	

Extra Wide Enclosure, 3-Phase, 3-Pole

Max Hp				Contactor Amp Range	NEMA Size	Half Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1® General Purpose		NEMA 4/4X Stainless® Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12® NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1½	1½	2	2	9	00	—	40BP82B*		Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	40CP82B*		40CP82W*		40CP82H*		40CP82J*	
7½	7½	10	10	27	1	—	40DP82B*		40DP82W*		40DP82H*		40DP82J*	
10	10	15	15	40	—	1¾	40EP82B*		40EP82W*		40EP82H*		40EP82J*	
10	15	25	25	45	2	—	40FP82B*		40FP82W*		40FP82H*		40FP82J*	
15	20	30	30	60	—	2½	40GP82B*		40GP82W*		40GP82H*		40GP82J*	
25	30	50	50	90	3	—	40HP82B*		40HP82W*		40HP82H*		40HP82J*	
30	40	75	75	115	—	3½	40IP82B*		40IP82W*		40IP82H*		40IP82J*	
40	50	100	100	135	4	—	40JG82B*		40JG82W*		40JG82H*		40JG82J*	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

- ① Dual voltage coils not available in size 5-8 starters.
② For conduit hubs and conversion instructions, see page 9/110.

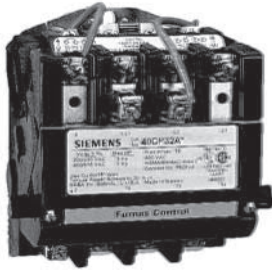
③ Enclosure is NEMA Type 4 (painted steel).

- ④ Only available
F coil 100-250V AC 50/60Hz, or DC
H coil 150-500V AC 50/60Hz, or DC

⑤ Only available
F coil 100-250V AC 50/60Hz, or DC

Standard Auxiliary Contacts			
Type	Size (3rd Character)	Configuration	Internal / External
All FVNR Starters & Contactors	B Thru E	1N.O.	Internal
	F Thru J	1N.O.	External
	L Thru M	2N.O., 2N.C.	External
	N Thru P	1N.O., 1N.C.	External

⑦ Lugs are not included, refer to page 9/108.



Ordering Information

- Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- Field Modification Kits see page 9/104.
- Factory Modifications see page 9/119.
- Dimensions see pages 9/144 open and 9/157 enclosed.
- Wiring Diagrams see page 9/184.
- Replacement Parts see page 9/131.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 ^①	A
200–208	D
220–240	G
277	L
220–240/440–480 ^①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

Open Type & Standard Width Enclosure, Single Phase, 2-Pole^{③④}

Max Hp		Cont-actor Amp Rating	NEMA Size	Half Size	Enclosure											
115 Volts	208/ 230 Volts				Open Type ^⑤		NEMA 1 General Purposes		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosure Indoor/Outdoor Use		NEMA 12 NEMA 3/3R ^② Industrial Use Weatherproof	
					Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
1/8	1	9	00	—	40BP12A*		40BP12B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1	2	18	0	—	40CP12A*		40CP12B*		40CP12W*		40CP12F*		40CP12H*		40CP120*	
2	3	27	1	—	40DP12A*		40DP12B*		40DP12W*		40DP12F*		40DP12H*		40DP120*	
3	5	35	1P	—	40EP12A*		40EP12B*		40EP12W*		40EP12F*		40EP12H*		40EP120*	
3	7 1/2	45	2	—	40FP12A*		40FP12B*		40FP12W*		40FP12F*		40FP12H*		40FP120*	
5	10	60	—	2 1/2	40GP12A*		40GP12B*		40GP12W*		40GP12F*		40GP12H*		40GP120*	
7 1/2	15	90	3	—	40HP12A*		40HP12B*		40HP12W*		40HP12F*		40HP12H*		40HP120*	

Open Type & Standard Width Enclosure, 4-Pole

Max Hp				Con- tactor Amp Rating	NEMA Size	Half Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts				Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosure Indoor/Outdoor Use		NEMA 12 NEMA 3/3R ^② Industrial Use Weatherproof	
							Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$
1/2	1 1/2	2	2	9	00	—	40BP22A*		40BP22B*		Use Size 0	—	Use Size 0	—	Use Size 0	—		
2	3	5	5	18	0	—	40CP22A*		40CP22B*		40CP22W*		40CP22F*		40CP22H*			
3	7 1/2	10	10	27	1	—	40DP22A*		40DP22B*		40DP22W*		40DP22F*		40DP22H*			
5	10	15	15	40	—	1 1/4	40EP22A*		40EP22B*		40EP22W*		40EP22F*		40EP22H*			

Vacuum Contactors, 3-Phase, 3-Pole^①



Max Hp				Contactor Amp Rating	NEMA Size	Open Type	
200V	230V	460V	575V			Catalog Number	List Price \$
40	50	100	100	135	4	40JV32A*	
75	100	200	200	270	5	40LV32A*	
150	200	400	400	540	6	40MV32A*	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available for vacuum contactors. Refer to Page 9/119 for a complete list of available coil voltages.

② For conduit hubs and conversion instructions, see page 9/110.

③ To order single phase contactor in an extra wide enclosure, order the enclosure kit from Page 9/113 and the open style contactor as separate items.

④ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.

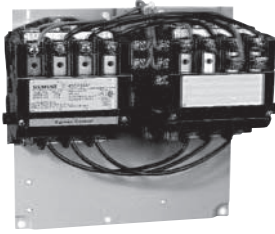
⑤ 1 NO Auxiliary.

Reversing Heavy Duty Contactors

Class 43

• Revised •
07/20/15

Selection



Ordering Information

- ▶ Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- ▶ Field Modification Kits see page 9/104.
- ▶ Factory Modifications see page 9/119.
- ▶ Dimensions see pages 9/145 open and 9/162 enclosed.
- ▶ Wiring Diagrams see page 9/184.
- ▶ Replacement Parts see page 9/131.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240 ^①	A
200–208	D
220–240	G
277	L
220–240/440–480 ^①	C
440–480	H
575–600	E

For other voltages and frequencies, see Factory Modifications page 9/119.

Open Type & Standard Width Enclosure, 3-Phase, 3-Pole

Max Hp				Cont-actor Amp Rating	NEMA Size	Half Size	Enclosure											
200 Volts	230 Volts	460 Volts	575 Volts				Open Type ^②		NEMA 1 General Purpose		NEMA 4/4X Stainless ^② Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 ^② NEMA 3/3R Industrial Use Weatherproof	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
½	½	2	2	9	00	—	43BP32A*		43BP32B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
3	3	5	5	18	0	—	43CP32A*		43CP32B*		43CP32W*		43CP32F*		43CP32H*		43CP320*	
7½	7½	10	10	27	1	—	43DP32A*		43DP32B*		43DP32W*		43DP32F*		43DP32H*		43DP320*	
10	10	15	15	40	—	1¼	43EP32A*		43EP32B*		43EP32W*		43EP32F*		43EP32H*		43EP320*	
10	15	25	25	45	2	—	43FP32A*		43FP32B*		43FP32W*		43FP32F*		43FP32H*		43FP320*	
15	20	30	30	60	—	2½	43GP32A*		43GP32B*		43GP32W*		43GP32F*		43GP32H*		43GP320*	
25	30	50	50	90	3	—	43HP32A*		43HP32B*		43HP32W*		43HP32F*		43HP32H*		43HP320*	
30	40	75	75	115	—	3½	43IP32A*		43IP32B*		43IP32W*		43IP32F*		43IP32H*		43IP320*	
40	50	100	100	135	4	—	43JG32A*		43JG32B*		43JG32W*		43JG32F*		43JG32H*		43JG320*	
75	100	200	200	270	5	—	43LP32A*		43LP32B*		43LP32E* ^③		—	—	—	—	43LP320*	
100	200	400	400	540	6	—	43MP32A*		43MP32B*		43MP32E* ^③		—	—	—	—	43MP320*	
—	300	600	600	810	7⑤	—	43NH32A*		43NH32B*		43NH32E* ^③		—	—	—	—	43NH320*	
—	450	900	900	1215	8⑥	—	43PH32A*		—	—	—	—	—	—	—	—	—	—

Open Type & Standard Width Enclosure, Single Phase, 3-Wire, 2-Pole^④

Max Hp		Cont-actor Amp Rating	NEMA Size	Enclosure											
115 Volts	208/ 230 Volts			Open Type		NEMA 1 General Purpose		NEMA 4/4X Stainless [®] Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4X Fiberglass Watertight, Dust-tight Corrosion Resistant		NEMA 7 & 9 NEMA 3 & 4 Div 1 and Div 2 Class I Groups C & D Class II Groups E, F & G Class III Bolted Enclosures Indoor/Outdoor Use		NEMA 12 [®] NEMA 3/3R Industrial Use Weatherproof	
				Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
1/2	1	9	00	43BP12A*		43BP12B*		Use Size 0	—	Use Size 0	—	Use Size 0	—	Use Size 0	—
1	2	18	0	43CP12A*		43CP12B*		43CP12W*		43CP12F*		43CP12H*		43CP120*	
2	3	27	1	43DP12A*		43DP12B*		43DP12W*		43DP12F*		43DP12H*		43DP120*	
3	5	35	1P	43EP12A*		43EP12B*		43EP12W*		43EP12F*		43EP12H*		43EP120*	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Dual voltage coils not available in size 5–8 starters.

② For conduit hubs and conversion instructions, see page 9/110.

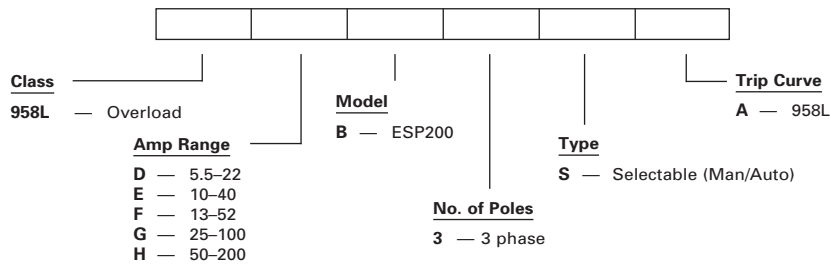
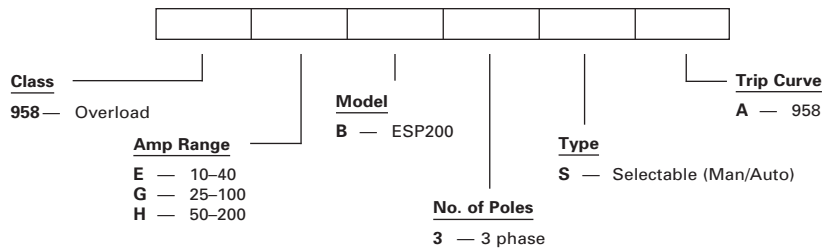
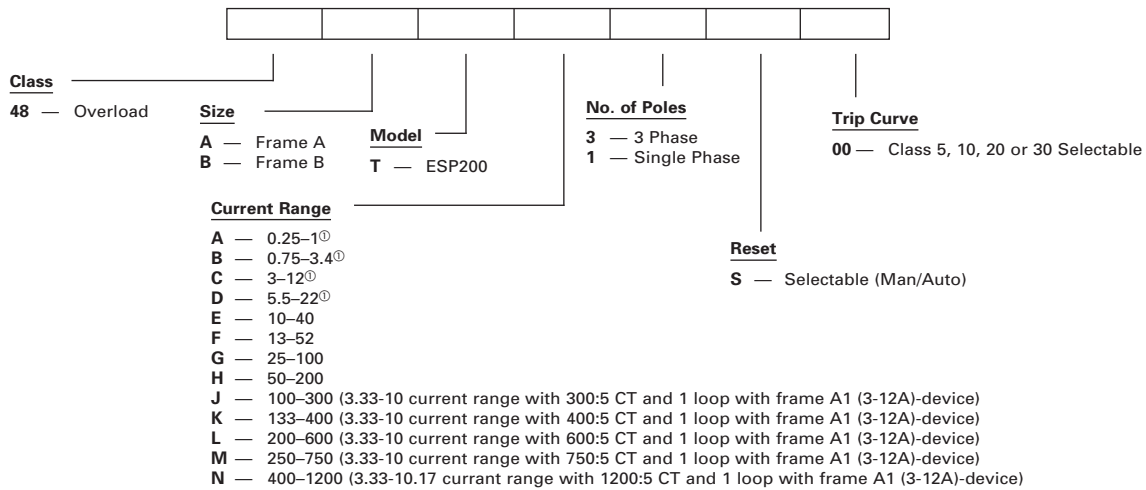
③ Enclosure is NEMA Type 4 (painted steel).

④ Coils D, F, or G will be wired for incoming voltage. J coil will be wired for separate source. Coils E, H, and L do not apply to single phase starters.

⑤ Only available
F coil 100–250V AC 50/60Hz, or DC
H coil 150–500V AC 50/60Hz, or DC

⑥ Only available
F coil 100–250V AC 50/60Hz, or DC

⑦ Auxiliary contacts
43B–43E 4th pole built-in
43F–43J 2 NO & 2 NC

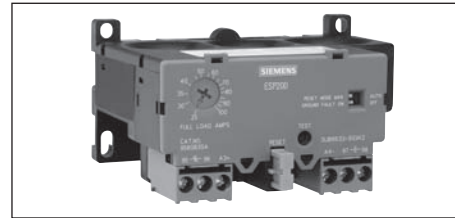
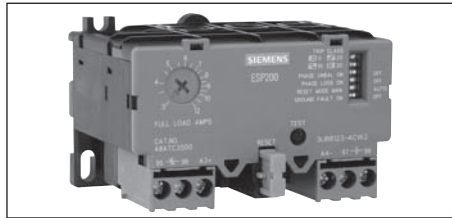


^① Ranges available in Single or 3-phase.

Overload Relays

Solid State ESP200, Class 48, 958 and 958L

General



Features	Benefits
<ul style="list-style-type: none"> ▪ Trip Classes - 5, 10, 20, or 30 Selectable by DIP-switches 	<ul style="list-style-type: none"> ▪ Field changeable reduces time and inventory. Suitable for light, normal and heavy starting conditions
<ul style="list-style-type: none"> ▪ Phase Loss Protection - Trips in less than 3 Seconds 	<ul style="list-style-type: none"> ▪ Protects motor burn out and minimizes motor heating up
<ul style="list-style-type: none"> ▪ Phase Unbalance - Trips based on Trip Class selected 	<ul style="list-style-type: none"> ▪ Minimizes temperature rise of the motor on a asymmetrical three-phase-system
<ul style="list-style-type: none"> ▪ Ground Fault - Trips 60% of Motor Current 	<ul style="list-style-type: none"> ▪ Provides optimum system protection of motors against high-resistance short-circuits or ground faults due to moisture, condensation, damage of insulation or any other reason
<ul style="list-style-type: none"> ▪ Trip Indicator - Visible 	<ul style="list-style-type: none"> ▪ Save time, faster to identify overload Trip
<ul style="list-style-type: none"> ▪ Ambient Insensitive 	<ul style="list-style-type: none"> ▪ Prevents nuisance tripping
<ul style="list-style-type: none"> ▪ No Heaters Required 	<ul style="list-style-type: none"> ▪ Saves cost and eliminates time for installation of heaters
<ul style="list-style-type: none"> ▪ Self-Powered - No outside source required 	<ul style="list-style-type: none"> ▪ Reduce cost for external power supply
<ul style="list-style-type: none"> ▪ FLA dial with wide Adjustment - 4:1 ratio 	<ul style="list-style-type: none"> ▪ Provides wide range, reduces inventory
<ul style="list-style-type: none"> ▪ Self Protected in short circuit condition (when used with proper fuses or motor starter protector) 	<ul style="list-style-type: none"> ▪ Unlike bimetal overloads, this eliminates replacement of the overload heaters after short circuit
<ul style="list-style-type: none"> ▪ Test Button - Tests Electronics 	<ul style="list-style-type: none"> ▪ Tests the complete electronic functions including the trip mechanism. Increases up time
<ul style="list-style-type: none"> ▪ Thermal Memory 	<ul style="list-style-type: none"> ▪ Prevents re-starting motor when it is still hot
<ul style="list-style-type: none"> ▪ Conformally coated circuit board 	<ul style="list-style-type: none"> ▪ Resists against environmental conditions
<ul style="list-style-type: none"> ▪ 1 NO and 1NC Contacts Standard. B600, R300 	<ul style="list-style-type: none"> ▪ Makes it easier for user to wire local contacts
<ul style="list-style-type: none"> ▪ Operating Temperature: -25 °C - 65 °C 	<ul style="list-style-type: none"> ▪ Wide operating temperature range prevents nuisance tripping with temperature changes
<ul style="list-style-type: none"> ▪ Repeat Accuracy <1%. 	<ul style="list-style-type: none"> ▪ For more precise settings and reduced nuisance tripping
<ul style="list-style-type: none"> ▪ Removable Terminal Block 	<ul style="list-style-type: none"> ▪ Terminal Block can be removed without removing wires. Saves time for replacements
<ul style="list-style-type: none"> ▪ Automatic reset 	<ul style="list-style-type: none"> ▪ Auto. Reset is 3 minutes after tripping, allowing motor to cool down before re-start. If Manual Reset is selected, overload can be reset immediately
<ul style="list-style-type: none"> ▪ Remote reset 	<ul style="list-style-type: none"> ▪ As an alternative to the mechanical RESET options, an electrical remote RESET can be used by applying 24 V DC to terminals A3 and A4
<ul style="list-style-type: none"> ▪ DIN Rail Mounted 	<ul style="list-style-type: none"> ▪ Reduces installation time
<ul style="list-style-type: none"> ▪ Touch - Safe Terminals 	<ul style="list-style-type: none"> ▪ Protects against accidental touching of live circuits
<ul style="list-style-type: none"> ▪ UL listed CSA certified 	<ul style="list-style-type: none"> ▪ Third party approval standard

Overload Relays

Solid State ESP200, Class 48, 958, 958L and Bimetal

General

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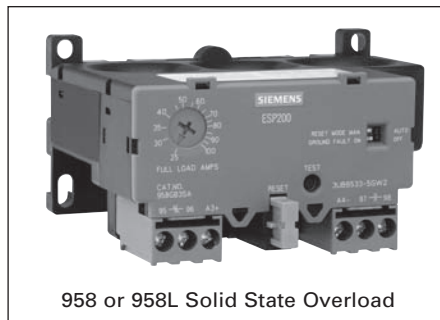
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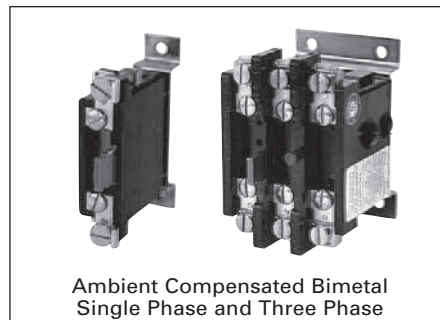
9



ESP200 Solid State Overload



958 or 958L Solid State Overload



Ambient Compensated Bimetal
Single Phase and Three Phase

Applications

ESP200 Solid State Overloads

Designed for a wide variety of applications. The field selectable Trip Class 5, 10, 20 or 30 can easily be set by 2 DIP switches. This eliminates the guess factor of an application requirements and provides reduced inventory for multiple applications. The inherent benefits of the ESP200 ultimately results in cost savings for the user.

ESP200 has a 4:1 current adjustment range with a fine adjustment dial labeled in full load amps. The heaterless overload minimizes the heat trapped in the enclosures, reduces cost for ventilation or cooling. Easily accessible Reset button, provides visible and audible indications to ensure the tripped overload is ready to re-start.

Designed to replace thermal, or ESP100 overload relays for any application. It has the same dimensions and footprint of the ESP100 overload relays. It can be directly coupled to the contactors or remotely mounted. In addition to the NEMA contactor applications, it also can be used with other types of controllers for applications requiring DP or IEC contactors. As a retrofit for other brands, it is used with a plate available for retrofitting competitive products.

958 ESP200 Special Use Solid State Overloads

This overload is specifically designed for special applications, to provide excellent protection of hermetically sealed and artificially cooled motors that require ambient insensitive and quick trip response times. Combined with a series lockout relay, it provides unsurpassed protection for hermetically sealed compressor motors in air conditioning applications. The combination of high trip speed, current adjustment, and ease of installation makes it suitable for these applications. The trip curves are customized to provide proper overload protection for these loads without causing nuisance tripping.

It has selectable manual or automatic reset mode, and provides ground fault selection to protect equipment from damage in case of a fault.

958L ESP200 Oil Field Solid State Overloads

Specifically designed for the oil market and the cycling loads experienced with these types of pumping applications. These overload relays provide protection for standard motors, oil well pump motors, multi-torque connections, and ultra-high slip motors.

Rotors can be damaged in less than 15 seconds during motor stall conditions if electrical power is not removed. To prevent damage during motor stall, the 958L solid state overload removes the power in 7 seconds at 250% lock rotor current. Therefore, the motor casing and the rotor will be protected from being damage saving the user money and time.

Ambient Compensated Bimetal Overloads

- Automatic or manual reset adjustment
- A manual test button is provided to test the operation of the 3-pole overload relay control contacts
- $\pm 15\%$ nominal trip current adjustment
- Accept either standard Class 20 or Quick Trip (NEMA Class 10) heater elements without any other changes or adjustments
- Available with a normally open contact for an alarm circuit (SPDT) up to 60A
- Compensated bimetal overload relays provide a constant trip time in ambient temperatures from -20°F to $+170^{\circ}\text{F}$ for a given heater rating
- UL Listed File #E22655 or Component Recognized
- CSA Certified File #LR6535

Ambient Compensated Bimetal Overloads

These thermal type overload relays are used to protect motors from excessive heat resulting from sustained motor overloads, rapid motor cycling and stalled rotor conditions. Although these devices function based on thermal principles they are designed to compensate for the ambient air temperature surrounding the overload. This helps prevent the occurrence of nuisance tripping when there are high surrounding ambient temperatures. The percentage of overload determines the length of time required to open the circuit.

Overload Relays

Solid State Class 48, ESP200 and 3RB20

Selection



3-Phase, 48ATC3S00

Ordering Information

- ▶ For CT's see Accessories page 9/67.
- ▶ Dimensions see page 9/146.
- ▶ To retrofit or direct mount to a contactor, order 49ASMP1, 2, or 3 separately. See Retrofit Plates below.
- ▶ For remote mounting of frame size A order 49ASMS1 terminals separately, see page 9/108.

Solid State—Class 48

Current Adjustment Range	Phase	Frame Size	Catalog Number	MRPD/MLFB	List Price \$
0.25–1	3	"A"	48ATA3S00	3UB81134AB2	
0.75–3.4	3	"A"	48ATB3S00	3UB81134BB2	
3–12	3	"A1"	48ATC3S00	3UB81234CW2	
5.5–22	3	"A1"	48ATD3S00	3UB81234DW2	
10–40	3	"A1"	48ATE3S00	3UB81234EW2	
13–52	3	"B"	48BTF3S00	3UB81334FW2	
25–100	3	"B"	48BTG3S00	3UB81334GW2	
50–200	3	"B"	48BTH3S00	3UB81334HW2	
100–300	3	"A1" ②	48ATJ3S00	3UB81234JW2	
133–400	3	"A1" ③	48ATK3S00	3UB81234KW2	
200–600	3	"A1" ④	48ATL3S00	3UB81234LW2	
250–750	3	"A1" ⑤	48ATM3S00	3UB81234MW2	
400–1220	3	"A1" ⑥	48ATN3S00	3UB81234NW2	
0.25–1	1	"A"	48ATA1S00	3UB88134AB2	
0.75–3.4	1	"A"	48ATB1S00	3UB88134BB2	
3–12	1	"A1"	48ATC1S00	3UB88234CW2	
5.5–22	1	"A1"	48ATD1S00	3UB88234DW2	
25–100	1	"B"	48BTG1S00	3UB88334GW2	

Solid State—3RB206^{③④}, 3-Phase, Manual/Auto Reset

For Contactor Size	Setting Range Amps	Class 10 Catalog Number	List Price \$	Class 20 Catalog Number	List Price \$
5	55 - 250	3RB2066-1GC2		3RB2066-2GC2	
6	160 - 630	3RB2066-1MC2		3RB2066-2MC2	

Retrofit Plates for Contactors, Class 48

Replacement for Starter Sizes	ESP200 Overload Frame Size ^①	Retrofit Plate Suffix	Plate Kit Separate	Price Adder \$
Size 00–1¼ Size 2, 2½	A or A1 B	1P 2P	49ASMP1 49ASMP2	
Size 3, 3½ Size 4	B B	3P 4P	49ASMP3 49ASMP3	

Ambient Compensated Bimetal—Open Type Class 48 Single Phase, 3-Phase (Panel Mount Only)

Poles	Amp Rating	Auxiliary Contacts	Contact Rating	Catalog Number	List Price \$
1	25 60 100 180	1 NC 1 NC 1 NC 1 NC	5A (B600) & 5A (P300)	48DA18AA4 48GA18AA4 48HA18AA4 48JA18AA4	
3	30 30 60 60 100 180	1 NC 1 NO/NC 1 NC 1 NO/NC 3 NC 3 NC	10A (A600) & 5A (P300) 5A (B600) & 5A (P300)	48DC38AA4 48DC39AA4 48GC38AA4 48GC39AA4 48HA38AA4 48JA38AA4	

① To determine frame size of replacement solid state overload, refer to retrofit plates table above.

② Requires use of 300:5 Current Transformers—3 of 97CT005.

③ Product Category: IEC.

④ Requires use of 600:5 Current Transformers—3 of 97CT008.

⑤ Requires use of 1200:5 Current Transformers—3 of 97CT012.

⑥ Overload has busbar connections.

⑦ Requires use of 750:5 Current Transformers—3 of 97CT009.

⑧ Requires use of 400:5 Current Transformers—3 of 97CT006.

Overload Relays

Special Use Solid State Overloads, Class 958 and 958L

Selection



Class 958, 958L

Ordering Information

► Dimensions see page 9/146.

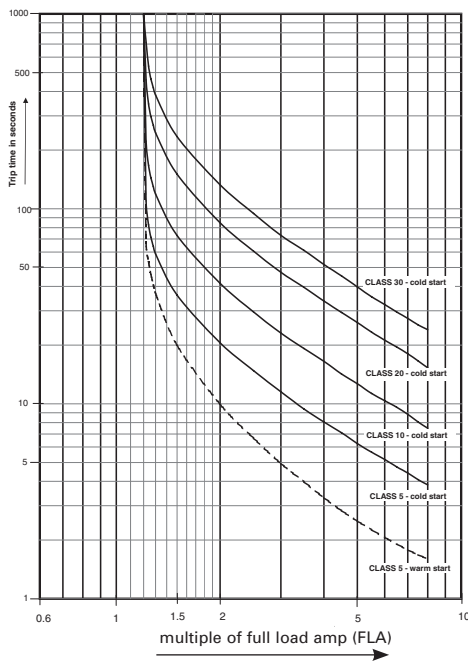
Current Transformers

Rating	Catalog No.	List Price \$
150:5	97CT002	
200:5	97CT003	
250:5	97CT004	
300:5	97CT005	
400:5	97CT006	
600:5	97CT008	
750:5	97CT009	
1200:5	97CT012	

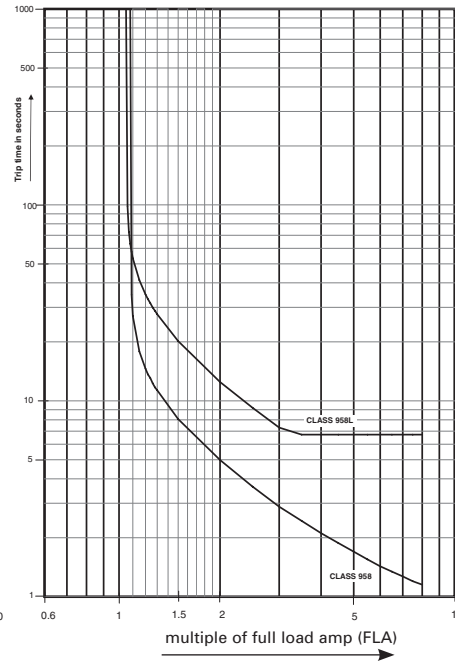
Solid State—Class 958 and 958L

Current Adjustment Range	Phase	Frame Size	Catalog Number	MRPD/MLFB	List Price \$
10–40	3	"A1"	958EB3SA	3UB85235EW2	
25–100	3	"B"	958GB3SA	3UB85335GW2	
50–200	3	"B"	958HB3SA	3UB85335HW2	
5.5–22	3	"A1"	958LB3SA	3UB85236DW2	
10–40	3	"A1"	958LEB3SA	3UB85236EW2	
13–52	3	"B"	958LFB3SA	3UB85336FW2	
25–100	3	"B"	958LGB3SA	3UB85336GW2	
50–200	3	"B"	958LHB3SA	3UB85336HW2	

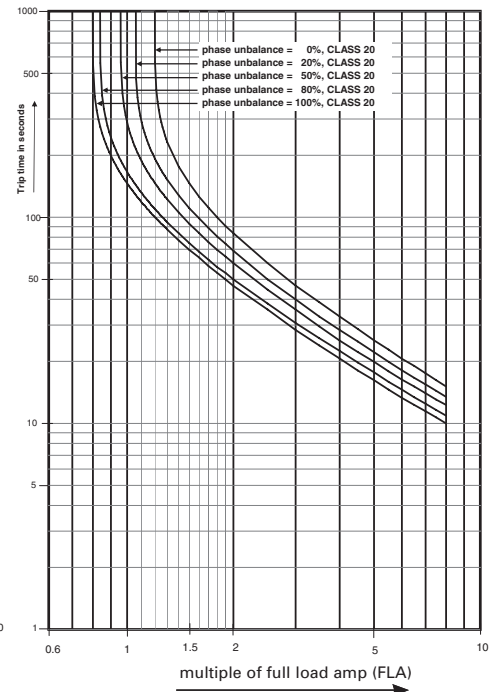
Time - Current - Characteristics
CLASS 48



Time - Current - Characteristics
CLASS 958, 958L



Trip - curve depending on unbalance
CLASS 20



① Temperature rating -25° to $+60^{\circ}\text{C}$.

Pump Control Panels

Slim Line NEMA Pump Controller for the Agricultural industry, Class 82

• Revised •
09/18/15

General

Features

The Class 82 Slim Line NEMA Pump was designed specifically for the agricultural market. It is well suited for irrigation and similar pumping applications and is built to withstand the harsh elements of the outdoors

Typical applications include:

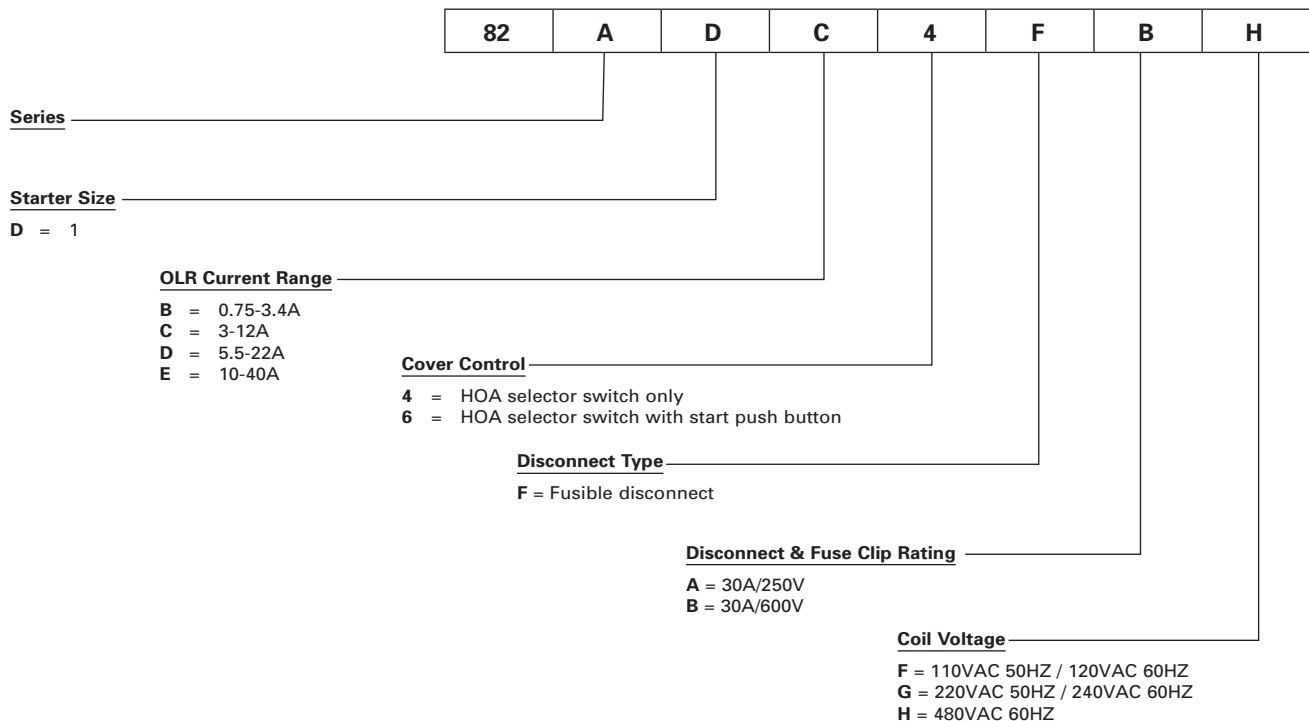
- Crop irrigation
- Sprinklers, misters and soakers
- Watering for livestock and other dairy applications
- Ground dewatering for excavation and construction sites

Why you should use the Class 82 Pump Panel

- Simplicity and its compact lightweight design makes this an attractive solution to your budgeting challenges.
- The contactor is NEMA rated to provide reliable motor control and protection expected in the most demanding applications.
- The ESP200 solid-state overload relay has a protective coating on the circuit board which gives it superior protection against high humidity, condensation and corrosive environments.
- Its size and weight is about half that of the Class 87 which increases the ease of installation.



Catalog Numbering System





Ordering Information

- Field Modification Kits (see accessories on this page)
- Factory Modifications (NA)
- Dimensions see page 9/167
- Wiring Diagram see page 9/187
- Replacement Parts (refer to instruction sheet A5E35327591A)

Coil Table

50/60Hz Voltage	Letter
110/120	F
220/240	G
480	H

Product Selection

Max Hp Rating Motor Voltage		NEMA Size	Overload Relay Amp Range	Disc. Amp Rating	Fuse Clip Amp/Volts	HOA Only		HOA & Start Push Button	
230	460					Catalog Number	List Price \$	Catalog Number	List Price \$
—	1	1	0.75–3.4	30	30A/600V	82ADB4FB*		82ADB6FB*	
—	5	1	3–12	30	30A/600V	82ADC4FB*		82ADC6FB*	
—	10	1	5.5–22	30	30A/600V	82ADD4FB*		82ADD6FB*	
2	—	1	3–12	30	30A/250V	82ADC4FA*		82ADC6FA*	
3	—	1	5.5–22	30	30A/250V	82ADD4FA*		82ADD6FA*	
7 1/2	—	1	10–40	30	30A/250V	82ADE4FA*		82ADE6FA*	

Replace the (*) with a letter from the coil table.

Accessories

Image	Description	Catalog Number	List Price
	3/4" type 3R conduit hub	ECHS075	
	1" type 3R conduit hub	ECHS100	
	1 1/4" type 3R conduit hub	ECHS125	
	1 1/2" type 3R conduit hub	ECHS150	
	Disconnect switch auxiliary contacts 2 NO/2 NC DPDT (NEMA A600)	HA261234	
	Fuse puller kit for 30A switch (1 kit required per switch)	HP61	
	30A, 240V Class R Fuse Clip Kits	HR21	
	30A, 600V Class R Fuse Clip Kits	HR612	

Image	Description	Catalog Number	List Price
	Contactor auxiliary contacts, side mounted 1 NO/NC (NEMA A300/ Q300)	3RH29111DA11	
	ESP200 tamper resis- tance cover	49ASTC1	
	Start push button with contact block	52PA8A1K	
	Start legend plate	52NL03	

Pump Control Panels

Slim Line NEMA Pump Controller for the Agricultural industry, Class 82

• Revised •
09/18/15

Selection

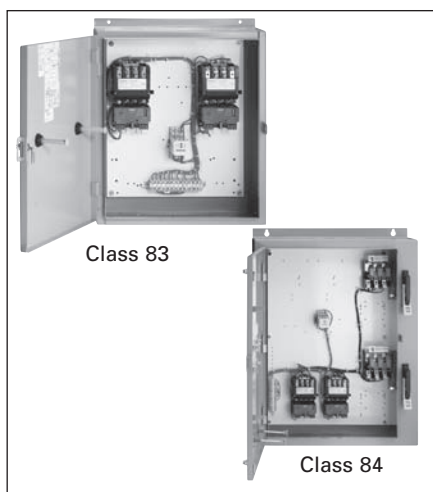
Class 82 Technical information

General technical data:	
Weight	23 lb
Height x Width x Depth	26 x 12 x 5 in.
Maximum altitude	6560 ft
Ambient (outside enclosure) storage temperature	(-30 to 65)°C / (-22 to 149)°F
Ambient (outside enclosure) operating temperature	(-20 to 40)°C / (-4 to 104)°F
Country of origin	USA
Horsepower rating:	
82ADB*FBH 1Hp@460VAC (NEMA size 1)	82ADC*FAG 2Hp@230VAC (NEMA size 1)
82ADC*FBH 5Hp@460VAC (NEMA size 1)	82ADD*FAG 3Hp@230VAC (NEMA size 1)
82ADD*FBH 10Hp@460VAC (NEMA size 1)	82ADE*FAG 7 1/2Hp@230VAC (NEMA size 1)
Contactor:	
Number of NO main contacts	3
Amp rating	32 A
Mechanical operating cycles	10,000,000
Internal / standard auxiliary contact:	
Number of NC / NO auxiliary contacts	1NC / 1NO
NEMA contact rating designation	A600 AC / Q600 DC
Optional auxiliary contacts available:	Yes
Coil:	
Voltage	110/120 V 50/60 Hz, 220/230 V 50/60 Hz or 460 V 60Hz
Apparent pull-in / holding power	81 VA / 10.5 VA
Normal coil operating limits (% of rated voltage)	80% - 110% at 60 Hz
Pick-up time / Drop-out time	8-40 / 4-16 msec
Overload Relay:	
Current range	0.75 - 3.4 or 3 - 12 or 5.5-22 or 10 - 40 Amps
Trip Class	Class 5 / 10 / 20 (factory set) / 10
Trip detection	Overload, phase failure, phase unbalance, ground fault
Phase failure sensitivity	Trip time after phase-loss: < 3 sec
Repeat accuracy	within 1%
Reset options	Manual, automatic and remote
External reset	Yes
Test function	Electronics & manual actuation
Conformal coating on printed circuit board	Yes
Number of NC / NO auxiliary contacts	1NC / 1NO
Rating of auxiliary contacts	B600 AC / R300 DC
Single contact isolation	600 V
Dual contact isolation	300 V differing polarity / 600 V common polarity

Class 82 Technical information

Disconnect Switch:	
Rating	30 A with 30A/600 or 30A/250 V Class H fuse clips
Fuse type accepted	Class H, J or R
Enclosure:	
Type	NEMA Type 3/3R enclosure
Rating	Weather proof for outdoor use
Standard Control Devices:	
Hand-Off-Auto selector switch (both 4 & 6 cover control)	30mm metal housing with chrome finish
Start push button (6 cover control only)	30mm metal housing with chrome finish
Mounting/wiring:	
Mounting orientation	Vertical
Mounting type	Pole and surface
Disconnect line side connection type / torque	Box lug / 35 lb-in (14 - 10); 40 lb-in (8); 45 lb-in (6 - 4) AWG
Disconnect line side solid & stranded conductors	1x(14 - 2 AWG) 60/75°C AL or CU
Power terminal block connection type / torque	Screw / 24 - 32 lb-in.
Power terminal block solid & stranded conductors	1x(18 - 2 AWG) 75°C CU
Control terminal block connection type / torque	Screw / 12 - 18 lb-in.
Control terminal block solid & stranded conductors	1x(22 - 8 AWG) 75°C CU
Coil connection type / torque	Screw / 7 - 10 lb-in
Coil solid & stranded conductors	2 x (16 - 12 AWG) CU 60/75°C
Main auxiliary contact connection type / torque	Screw / 7 - 10 lb-in
Main auxiliary contact solid & stranded conductors	2 x (20 - 16 AWG), 2 x (18 - 14 AWG) 75°C CU
OLR auxiliary contact connection type / torque	Screw / 7 - 10 lb-in
OLR auxiliary contact solid & stranded conductors	2 x (20 - 14 AWG) CU 60/75°C
Short circuit current rating:	
Fuses	10kA@600V (Class H or K); 100kA@600V (Class R or J)
Certificates/approvals:	
cULus	UL (file no. E185287)
UL rated Service Entrance Equipment	

General



Features

- Heavy Duty NEMA Starters
- Solid State or Thermal Overload Relays
- Fusible or MCP
- Heavy Duty Disconnect Handle
- Flexibility with Field Modifications
- Alternator Transfer on De-energization
- UL Listed for Outdoor Use
- UL Listed file #E14900 (class 83); file #E185287 (class 84)
- CSA certified file #LR 6535 (class 83 & 84)

Application

Duplex pump controls are designed to perform one or both of two distinct functions: duplexing and alternation. The duplexing function provides capacity for system peaking or above normal demand without having the full motor capacity spinning at all times. It also provides standby capacity for use when one of the motors or pumps is disabled. The duplexing function is also referred to as lead/lag or main/standby. When two pumps or compressors are controlled by a duplex controller, they are started in sequence as necessary to attain preset values of pressure, flow or liquid level.

Two field devices such as pressure switches or float switches provide electrical signals to the duplex controller. One remote device is set to initiate the starting of the lead motor. This motor is rated to handle normal system demand. The second motor is usually the same rating and is referred to as the lag motor. It is only energized when the system demand is greater than the capacity of the lead motor. The lag motor is started when the second remote device is signalling for more output than the lead motor can produce.

The alternation function reverses the lead and lag mode for the two motors in a duplex system. Upon alternation the first motor as described above becomes the lag motor and the second motor assumes the lead function. The alternation is usually programmed to occur at any time both pumps come to rest. The alternation function equalizes wear on the two machines and extends the life of seals and bearings.

Enclosure Types

Duplex controllers are available in NEMA 1, 12/3/3R, 4 (painted) and 4/4X (stainless) enclosures. Enclosures protect personnel from contact with live parts and depending upon the construction, protect the control in varying degrees from physical damage and harmful atmospheres. All enclosures are supplied with corrosion resistant finishes.

Heavy Duty Starters

These Duplex controllers use the same starters described in the heavy duty starter section of this catalog.

Siemens Type ETI Circuit Breaker

The ETI circuit breaker is a device designed specifically for application in motor circuits. The ETI is a magnetic only protective device designed to provide protection against short circuit current.

The instantaneous-only type ETI circuit breaker employs adjustable magnetic trip settings to allow broader application ranges and a higher degree of motor short circuit protection.

Features

Two control transformers may be provided for low voltage control to safeguard personnel from high voltage. One transformer is required for each starter to provide independent control circuits.

A Hand-Off-Auto selector switch for each starter may be mounted in the enclosure door or furnished separately for remote control. Test push buttons or pilot lights may also be installed on the enclosure.

Solid-state or Ambient Compensated Bimetal Overload Relays are supplied as standard.

Heavy Duty Disconnect Switches

The disconnect switch that goes the distance in durability, performance and reliability has the following advantages:

- Visible blades for the highest level of safety
- Double break switching action to reduce arcing, increase lifetime and eliminate the "electric hinge"
- More rugged positive action switch
- Oversized lugs are standard
- Line side shield to help guard personnel from contact with live parts
- Higher horsepower rating for design E high efficiency motors
- UL listed for IIsco, Burndy and T&B crimp type lugs
- The 200A switch accepts up to 300 MCM versus 250 MCM wire size

Its rugged construction - with a high fault withstand rating of 100kA at 600 VAC when fused with class R rated fuses - meets the most stringent industry standards set forth by the automotive, petro-chemical, and pulp and paper industries. UL recognized and CSA certified, our disconnect switches are available either non-fusible or fusible with class R and class J fuse clips.

Duplex Heavy Duty Controllers

Non-Combination, Class 83

Selection

Ordering Information	Coil Table																
<ul style="list-style-type: none"> Standard duplex controllers include an alternator indicated by characters "92" within the catalog number. The standard coil voltage supplied with the alternator is 120V separate control. This is the only control voltage available with the alternator. To omit the alternator, change the character string within the catalog number from "92" to "95". All coil voltages listed in the coil table are valid with non-alternator controllers. To change the coil voltage for non-alternator controllers with a solid-state OLR, change the 9th character in the catalog number with a letter shown in the coil table. To change the coil voltage for non-alternator controllers with a bimetal OLR, change the 8th character in the catalog number with a letter shown in the coil table. Heater elements for bimetal overloads see page 9/124 (6-Required). Field Modification Kits see page 9/104. Factory Modifications see page 9/119. Dimensions see page 9/168. 	<table> <tr> <th>60Hz Voltage</th><th>Letter</th></tr> <tr> <td>24^②</td><td>J</td></tr> <tr> <td>120</td><td>F</td></tr> <tr> <td>200–208^②</td><td>D</td></tr> <tr> <td>220–240^②</td><td>G</td></tr> <tr> <td>277^②</td><td>L</td></tr> <tr> <td>440–480^②</td><td>H</td></tr> <tr> <td>550–600^②</td><td>E</td></tr> </table>	60Hz Voltage	Letter	24 ^②	J	120	F	200–208 ^②	D	220–240 ^②	G	277 ^②	L	440–480 ^②	H	550–600 ^②	E
60Hz Voltage	Letter																
24 ^②	J																
120	F																
200–208 ^②	D																
220–240 ^②	G																
277 ^②	L																
440–480 ^②	H																
550–600 ^②	E																
<ul style="list-style-type: none"> Wiring Diagrams see page 9/185. Replacement Parts see page 9/131. 																	

Non-Combination (with Solid-State Overload)

Max Hp				NEMA Size	Half Size	Overload		Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size	NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight, Dust-tight		NEMA 12 NEMA 3/3R ^① Industrial Use Weatherproof (Field Convertible to 3/3R)	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/8	1/8	1/8	1/8	0	—	0.25–1	A	83CUA92BF		83CUA92WF		83CUA92EF		83CUA920F	
1/4	1/4	1/4	1/4	0	—	0.75–3.4	A	83CUB92BF		83CUB92WF		83CUB92EF		83CUB920F	
2	2	5	5	0	—	3–12	A1	83CUC92BF		83CUC92WF		83CUC92EF		83CUC920F	
3	3	—	—	0	—	5.5–22	A1	83CUD92BF		83CUD92WF		83CUD92EF		83CUD920F	
1/8	1/8	1/8	1/8	1	—	0.25–1	A	83DUA92BF		83DUA92WF		83DUA92EF		83DUA920F	
1/4	1/4	1/4	1/4	1	—	0.75–3.4	A	83DUB92BF		83DUB92WF		83DUB92EF		83DUB920F	
2	2	5	5	1	—	3–12	A1	83DUC92BF		83DUC92WF		83DUC92EF		83DUC920F	
3	3	10	10	1	—	5.5–22	A1	83DUD92BF		83DUD92WF		83DUD92EF		83DUD920F	
7 1/2	7 1/2	—	—	1	—	10–40	A1	83DUE92BF		83DUE92WF		83DUE92EF		83DUE920F	
10	10	15	15	—	1 1/4	10–40	A1	83EUE92BF		83EUE92WF		83EUE92EF		83EUE920F	
10	15	25	25	2	—	13–52	B	83FUF92BF		83FUF92WF		83FUF92EF		83FUF920F	
15	20	30	30	—	2 1/4	25–100	B	83GUG92BF		83GUG92WF		83GUG92EF		83GUG920F	
25	30	50	50	3	—	25–100	B	83HUG92BF		83HUG92WF		83HUG92EF		83HUG920F	
30	40	75	75	—	3 1/4	50–200	B	83IUH92BF		83IUH92WF		83IUH92EF		83IUH920F	
40	50	100	100	4	—	50–200	B	83JUH92BF		83JUH92WF		83JUH92EF		83JUH920F	

Non-Combination (with Ambient Compensated Bimetal Overload)

Max Hp				NEMA Size	Half Size	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight Dust-tight		NEMA 12/3R ^① Industrial Use Weatherproof	
Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	83CP92BF81		83CP92WF81		83CP92EF81		83CP920F81	
7 1/2	7 1/2	10	10	1	—	83DP92BF81		83DP92WF81		83DP92EF81		83DP920F81	
10	10	15	15	—	1 1/4	83EP92BF81		83EP92WF81		83EP92EF81		83EP920F81	
10	15	25	25	2	—	83FP92BF81		83FP92WF81		83FP92EF81		83FP920F81	
15	20	30	30	—	2 1/2	83GP92BF81		83GP92WF81		83GP92EF81		83GP920F81	
25	30	50	50	3	—	83HP92BF81		83HP92WF81		83HP92EF81		83HP920F81	
30	40	75	75	—	3 1/2	83IP92BF81		83IP92WF81		83IP92EF81		83IP920F81	
40	50	100	100	4	—	83JP92BF81		83JP92WF81		83JP92EF81		83JP920F81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① NEMA 12 is field convertible to NEMA 3/3R. For conduit hubs and conversion instructions, see page 9/110.
② Not available on standard alternator style ('92' in the catalog number).

③ For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

Duplex Heavy Duty Controllers

Combination Disconnect (Fusible & Non-Fusible), Class 84

Selection

Ordering Information	Coil Table														
<p>► Standard duplex controllers include an alternator indicated by characters "92" within the catalog number. The standard coil voltage supplied with the alternator is 120V separate control. This is the only control voltage available with the alternator.</p> <p>► To omit the alternator, change the character string within the catalog number from "92" to "95". All coil voltages listed in the coil table are valid with non-alternator controllers.</p> <p>► To change the coil voltage for non-alternator controllers with a solid-state OLR, change the 10th character in the catalog number with a letter shown in the coil table. To change the coil voltage for non-alternator controllers with a bimetal OLR, change the 9th character in the catalog number with a letter shown in the coil table.</p> <p>► Heater elements for bimetal overloads see page 9/124 (6-Required).</p> <p>► For factory installed fusible disconnect, see page 9/120.</p> <p>► Field Modification Kits see page 9/104.</p> <p>► Factory Modifications see page 9/119.</p>	<p>60Hz Voltage Letter</p> <table> <tr> <td>24^②</td><td>J</td></tr> <tr> <td>120</td><td>F</td></tr> <tr> <td>200-208^②</td><td>D</td></tr> <tr> <td>220-240^②</td><td>G</td></tr> <tr> <td>277^②</td><td>L</td></tr> <tr> <td>440-480^②</td><td>H</td></tr> <tr> <td>550-600^②</td><td>E</td></tr> </table> <p>► Dimensions see page 9/168.</p> <p>► Wiring Diagrams see page 9/185.</p> <p>► Replacement Parts see page 9/131.</p>	24 ^②	J	120	F	200-208 ^②	D	220-240 ^②	G	277 ^②	L	440-480 ^②	H	550-600 ^②	E
24 ^②	J														
120	F														
200-208 ^②	D														
220-240 ^②	G														
277 ^②	L														
440-480 ^②	H														
550-600 ^②	E														

Two Disconnect Switches with Solid-State Overload

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight, Dust-tight		NEMA 12 NEMA 3/3R ^① Industrial Use Weatherproof (Field Convertible to 3/3R)	
									Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
1/2	1/2	1/2	1/2	0	—	0.25-1	A	30	84CUA92BDF		84CUA92WDF		84CUA92EDF		84CUA920DF	
1/2	3/4	1 1/2	2	0	—	0.75-3.4	A	30	84CUB92BDF		84CUB92WDF		84CUB92EDF		84CUB920DF	
2	2	5	5	0	—	3-12	A1	30	84CUC92BDF		84CUC92WDF		84CUC92EDF		84CUC920DF	
3	3	—	—	0	—	5.5-22	A1	30	84CUD92BDF		84CUD92WDF		84CUD92EDF		84CUD920DF	
1/2	1/2	1/2	1/2	1	—	0.25-1	A	30	84DUA92BDF		84DUA92WDF		84DUA92EDF		84DUA920DF	
1/2	3/4	1 1/2	2	1	—	0.75-3.4	A	30	84DUB92BDF		84DUB92WDF		84DUB92EDF		84DUB920DF	
2	2	5	5	1	—	3-12	A1	30	84DUC92BDF		84DUC92WDF		84DUC92EDF		84DUC920DF	
3	3	10	10	1	—	5.5-22	A1	30	84DUD92BDF		84DUD92WDF		84DUD92EDF		84DUD920DF	
7 1/2	7 1/2	—	—	1	—	10-40	A1	30	84DUE92BDF		84DUE92WDF		84DUE92EDF		84DUE920DF	
10	10	15	15	—	1 1/2	10-40	A1	60	84EUE92BDF		84EUE92WDF		84EUE92EDF		84EUE920DF	
10	15	25	25	2	—	13-52	B	60	84FUF92BDF		84FUF92WDF		84FUF92EDF		84FUF920DF	
15	20	30	30	—	2 1/2	25-100	B	100	84GUG92BDF		84GUG92WDF		84GUG92EDF		84GUG920DF	
20	25	50	50	3	—	25-100	B	100	84HUG92BDF		84HUG92WDF		84HUG92EDF		84HUG920DF	
30	40	75	75	—	3 1/2	50-200	B	200	84IUH92BDF		84IUH92WDF		84IUH92EDF		84IUH920DF	
40	50	100	100	4	—	50-200	B	200	84JUH92BDF		84JUH92WDF		84JUH92EDF		84JUH920DF	

Two Disconnect Switches with Ambient Compensated Bimetal Overload

Max Hp				NEMA Size	Half Size	Disc. Amp Range	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight Dust-tight		NEMA 12/3R ^① Industrial Use Weatherproof	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
3	3	5	5	0	—	30	84CP92BDF81		84CP92WDF81		84CP92EDF81		84CP920DF81	
7 1/2	7 1/2	10	10	1	—	30	84DP92BDF81		84DP92WDF81		84DP92EDF81		84DP920DF81	
10	10	15	15	—	1 1/4	60	84EP92BDF81		84EP92WDF81		84EP92EDF81		84EP920DF81	
10	15	25	25	2	—	60	84FP92BDF81		84FP92WDF81		84FP92EDF81		84FP920DF81	
15	20	30	30	—	2 1/2	100	84GP92BDF81		84GP92WDF81		84GP92EDF81		84GP920DF81	
20	25	50	50	3	—	100	84HP92BDF81		84HP92WDF81		84HP92EDF81		84HP920DF81	
30	40	75	75	—	3 1/2	200	84IP92BDF81		84IP92WDF81		84IP92EDF81		84IP920DF81	
40	50	100	100	4	—	200	84JP92BDF81		84JP92WDF81		84JP92EDF81		84JP920DF81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① NEMA 12 is field convertible to NEMA 3/3R. For conduit hubs and conversion instructions, see page 9/110.

② Not available on standard alternator style ('92' in the catalog number).

③ For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

Duplex Heavy Duty Controllers

Combination Circuit Breaker, Class 84

Selection

Ordering Information	Coil Table																
<ul style="list-style-type: none"> ▶ Standard duplex controllers include an alternator indicated by characters "92" within the catalog number. The standard coil voltage supplied with the alternator is 120V separate control. This is the only control voltage available with the alternator. ▶ To omit the alternator, change the character string within the catalog number from "92" to "95". All coil voltages listed in the coil table are valid with non-alternator controllers. ▶ To change the coil voltage for non-alternator controllers, change the 10th character in the catalog number with a letter shown in the coil table. ▶ Heater elements for bimetal overloads see page 9/124 (6-Required). ▶ Field Modification Kits see page 9/104. ▶ Factory Modifications see page 9/119. 	<table> <tr> <th>60Hz Voltage</th><th>Letter</th></tr> <tr> <td>24^②</td><td>J</td></tr> <tr> <td>120</td><td>F</td></tr> <tr> <td>200–208^②</td><td>D</td></tr> <tr> <td>220–240^②</td><td>G</td></tr> <tr> <td>277^②</td><td>L</td></tr> <tr> <td>440–480^②</td><td>H</td></tr> <tr> <td>550–600^②</td><td>E</td></tr> </table>	60Hz Voltage	Letter	24 ^②	J	120	F	200–208 ^②	D	220–240 ^②	G	277 ^②	L	440–480 ^②	H	550–600 ^②	E
60Hz Voltage	Letter																
24 ^②	J																
120	F																
200–208 ^②	D																
220–240 ^②	G																
277 ^②	L																
440–480 ^②	H																
550–600 ^②	E																
▶ Dimensions see page 9/168.	▶ Wiring Diagrams see page 9/185.																
▶ Replacement Parts see page 9/131.																	

2 Motor Circuit Protectors (with Solid-State Overload)

Max Hp				NEMA Size	Half Size	Overload		Motor Circuit Interrupter ETI	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size		NEMA 1 General Purpose	NEMA 4/4X Stainless Watertight, Dust-tight, Corrosion Resistant , 304 Stainless Steel,		NEMA 4 Painted Watertight, Dust-tight		NEMA 12 NEMA 3/3R [Ⓢ] Industrial Use, Weatherproof (Field Convertible to 3/3R)		
										Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number
½	¾	½	½	0	—	0.25–1	A	3	84CUA92BMF		84CUA92WMF		84CUA92EMF		84CUA920MF	
½	¾	1½	2	0	—	0.75–3.4	A	3	84CUB92BMF		84CUB92WMF		84CUB92EMF		84CUB920MF	
2	2	5	5	0	—	3–12	A1	10	84CUC92BMF		84CUC92WMF		84CUC92EMF		84CUC920MF	
3	3	—	—	0	—	5.5–22	A1	25	84CUD92BMF		84CUD92WMF		84CUD92EMF		84CUD920MF	
¾	¾	¾	¾	1	—	0.25–1	A	3	84DUA92BMF		84DUA92WMF		84DUA92EMF		84DUA920MF	
¾	¾	1½	2	1	—	0.75–3.4	A	3	84DUB92BMF		84DUB92WMF		84DUB92EMF		84DUB920MF	
2	2	5	5	1	—	3–12	A1	10	84DUC92BMF		84DUC92WMF		84DUC92EMF		84DUC920MF	
3	3	10	10	1	—	5.5–22	A1	25	84DUD92BMF		84DUD92WMF		84DUD92EMF		84DUD920MF	
7½	7½	—	—	1	—	10–40	A1	30	84DUE92BMF		84DUE92WMF		84DUE92EMF		84DUE920MF	
—	—	15	15	—	1½	10–40	A1	40	84EUE92BMF		84EUE92WMF		84EUE92EMF		84EUE920MF	
10	15	25	25	2	—	13–52	B	50	84FUF92BMF		84FUF92WMF		84FUF92EMF		84FUF920MF	
15	20	30	30	—	2½	25–100	B	100	84GUG92BMF		84GUG92WMF		84GUG92EMF		84GUG920MF	
20	25	50	50	3	—	25–100	B	100	84HUG92BMF		84HUG92WMF		84HUG92EMF		84HUG920MF	
30	40	75	75	—	3½	50–200	B	125	84IUH92BMF		84IUH92WMF		84IUH92EMF		84IUH920MF	
40	50	100	100	4	—	50–200	B	150	84JUH92BMF		84JUH92WMF		84JUH92EMF		84JUH920MF	

2 Motor Circuit Protectors (with Ambient Compensated Bimetal Overload)

Max Hp				NEMA Size	Half Size	Motor Circuit Interrupter ETI	Enclosure							
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X Stainless Watertight, Dust-tight Corrosion Resistant 304 Stainless Steel		NEMA 4 Painted Watertight Dust-tight		NEMA 12/3R ^① Industrial Use Weatherproof	
							Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
½	¾	1½	2	0	—	3	84CPB92BMF81		84CPB92WMF81		84CPB92EMF81		84CPB920MF81	
2	2	5	5	0	—	10	84CPD92BMF81		84CPD92WMF81		84CPD92EMF81		84CPD920MF81	
3	3	—	—	0	—	25	84CPE92BMF81		84CPE92WMF81		84CPE92EMF81		84CPE920MF81	
½	¾	1½	2	1	—	3	84DPB92BMF81		84DPB92WMF81		84DPB92EMF81		84DPB920MF81	
2	2	5	5	1	—	10	84DPD92BMF81		84DPD92WMF81		84DPD92EMF81		84DPD920MF81	
3	3	10	10	1	—	25	84DPE92BMF81		84DPE92WMF81		84DPE92EMF81		84DPE920MF81	
7½	7½	—	—	1	—	30	84DPF92BMF81		84DPF92WMF81		84DPF92EMF81		84DPF920MF81	
—	—	15	15	—	1¼	40	84EPF92BMF81		84EPF92WMF81		84EPF92EMF81		84EPF920MF81	
10	10	—	—	—	1¼	50	84EPG92BMF81		84EPG92WMF81		84EPG92EMF81		84EPG920MF81	
—	—	15	20	2	—	40	84FPF92BMF81		84FPF92WMF81		84FPF92EMF81		84FPF920MF81	
10	15	25	25	2	—	50	84FPH92BMF81		84FPH92WMF81		84FPH92EMF81		84FPH920MF81	
—	—	30	30	—	2½	50	84GPH92BMF81		84GPH92WMF81		84GPH92EMF81		84GPH920MF81	
15	20	—	—	—	2½	100	84GPJ92BMF81		84GPJ92WMF81		84GPJ92EMF81		84GPJ920MF81	
—	—	30	40	3	—	50	84HPJ92BMF81		84HPJ92WMF81		84HPJ92EMF81		84HPJ920MF81	
20	25	50	50	3	—	100	84HPK92BMF81		84HPK92WMF81		84HPK92EMF81		84HPK920MF81	
30	40	75	75	—	3½	125	84IPL92BMF81		84IPL92WMF81		84IPL92EMF81		84IPL920MF81	
40	50	100	100	4	—	150	84JPM92BMF81		84JPM92WMF81		84JPM92EMF81		84JPM920MF81	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① NEMA 12 is field convertible to NEMA 3/3R. For conduit hubs and conversion instructions, see page 9/110.
② Not available on standard alternator style ('92' in the catalog number).

③ For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

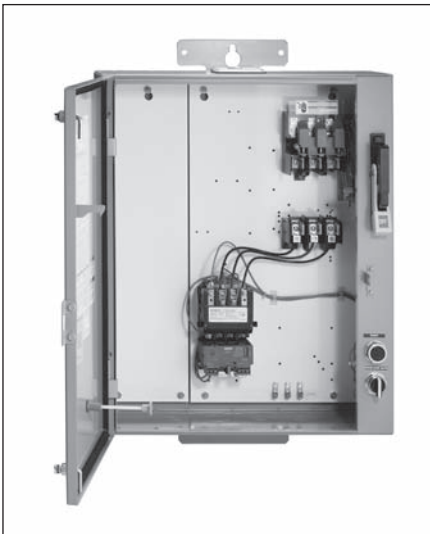
Pump Control Panels

Class 87, 88

General

Features

- Fully Gasketed NEMA 3R Rainproof Enclosures
- 100,000 Amp Interrupting Capacity with Class R Fuses
- Heavy Duty NEMA Starters
- Solid State or Ambient Compensated Bimetal Overload Relays
- Heavy Duty Disconnect Handle
- Available in Reduced Voltage Versions
- Bold Pilot Legend on Front
- Generous Accessory Space
- Copper Grounding Lug For Three #6 Wires
- UL Listed for Outdoor Use and Service Equipment File #E185287



Application

Heavy duty pump control panels are designed to withstand the most demanding environments. Typical applications include irrigation, agriculture, petrochemical, wastewater treatment and wherever motor control is challenged by harsh elements.

Rugged pump control panels utilized cold forming "tox" process. They are more rainproof, sleet and ice resistant than in the past.

Installation is easy. Panels are factory wired to provide flexible control and protect against short circuits and overloads. Ample space is provided for field modifications and installation of accessories.

The pump control panels feature a full sized removable auxiliary panel for the mounting of accessories. The fusible version features fuse clips for full sized RK5 or compact class J fuses and accessory mounting space for the most commonly used accessories.

Class 87 pump panels become jockey pump panels with the addition of a pressure switch. The jockey pump's primary function is to maintain water pressure at a preset level and thus compensate for possible shortage of water in the pumping system. When the water pressure drops below the preset level, the pressure switch energizes the starter which in turn activates the jockey pump. The water pressure is then brought back up to the desired level. This insures the maintenance of proper water pressure at all times.

Features

Specified by Fortune 500 companies, Siemens NEMA starters offer prolonged service under severe duty conditions. NEMA rated, these starters utilize large silver cadmium oxide contacts and wide copper heat sinks to ensure rapid heat dissipation and maximum electrical life.

ESP200 solid state overload relay

Refer to the section on Class 48 overload relays for features and benefits. Pump panels are factory set at trip Class 10.

The ambient compensated bimetal overload relays

are designed to parallel thermal characteristics of typical pump motors. They prevent nuisance trips that may result from operation of the control in a higher ambient temperature than that at the pump. These relays are trip-free, tamperproof and can be set to reset automatically or manually.

HOA and Start Pushbutton

Every pump panel comes with an HOA and a start pushbutton.

Half Size Starters

Siemens motor matched starters feature all the rugged performance characteristics of our NEMA rated starter sizes, but are fractionally sized to more closely match your exact motor rating. As a result, significant economic savings are made possible without sacrificing the reliability you expect from a heavy duty starter.

These additional starter sizes have the reserve capacity to handle occasional plugging and jogging without de-rating the device.

Siemens motor matched can save hundreds, even thousands of dollars per project.

Siemens motor matched starters comply with NEMA, UL and CSA standards.

Panels are predrilled for easy repositioning of the fuse trailer block to accommodate 250 and 600 volt fuses and full sized RK or compact J fuses. Circuit breakers are also available.

Heavy Duty Fusible Disconnect Switch

The disconnect switch has the following advantages:

- Visible blades for the highest level of safety
- Double Break Switching Action to reduce arcing, increase lifetime and eliminate the "electric hinge"
- Oversized lugs are standard
- Line side shield to help guard personnel from contact with live parts

Motor Circuit Protector

The motor circuit protector provides fast, accurate fault clearing that will minimize damage to the motor and control apparatus and protect branch circuit conductors. Continuous current ratings and adjustable trip ranges meet NEC requirements for full load and locked rotor currents. The adjustable instantaneous trip point can be set precisely to assure fault protection and eliminate nuisance tripping.

Removable Door

Enclosure door may be lifted off to make wiring easier.

Mounting Flanges

Convenient flanges at top and bottom of the enclosure provide easy mounting. They fit pole or flat surfaces using keyhole slots.

Quarter Turn Latches

Quarter turns are utilized to secure the door.

Wind Catches

A wind catch is provided to prevent the door from slamming shut (or open) due to high wind conditions.

Safety Disconnect Handle

Up to three padlocks can be used to lock the disconnect in the OFF position. Maintenance work can be performed without hazard to personnel.

External Reset

The overload relay may be quickly reset by means of a button on the front of the enclosure.

Bold Pilot Legend

Provides positive indication of the selector switch position for use to stop the pump motor.

Ground Lugs

Insures proper connecting of ground wires and lightning arresters.

UL Listed

Assures proper construction throughout control panel.

Reduced Voltage

Available in part winding, wye delta and auto transformer types, these controls may be necessary where the power company limits the amount of current drawn from its lines, or where starting torque must be reduced.

Fully gasketed NEMA 3/12 weather-proof enclosures are supplied with Class 88 reduced voltage starters.

Part Winding Starters apply starting current in timed steps to minimize voltage fluctuations.

Auto Transformer Starters maintain a closed circuit during transition and eliminate voltage or current surges. They draw less current than part winding starters and are well suited for starting motors over 20 Hp.

Wye Delta starters and motors are used in areas where the power supply is inadequate to supply full starting current without objectionable voltage drop or for applications where low starting torque is required. Centrifugal pumps and similar apparatus requiring a low starting torque are typical applications. Both ends of all three windings of the wye delta motor are brought out so that they may be accessible for reconnecting from wye to delta.

Auxiliary Equipment

Pilot Lights are easily installed on the enclosure. Oil Tight and Heavy Duty, they meet NEMA A600 requirements.

Lightning Arresters protect the control panel from lightning induced surges.

Undervoltage and Phase Sensing Relays protect the pump against low voltage, voltage imbalance, loss of phase and phase reversal.

Anti-Backspin Timers prevent the motor from starting during motor/shaft backspin.

The TOX Box

Siemens uses the TOX process to manufacture the enclosures for the pump panels.

Advantages of the TOX process:

- Joints are 50-70% stronger
- Since the TOX process compresses the metal at the joint, it does not leave the high stresses in the metal
- Increased corrosion resistance. The protective layer on the metal is not damaged in the process, but instead flows with the material


Class 87 NEMA Vacuum Starter Pump Control Panels

The Siemens vacuum starter pump controllers are designed for the harshest environments. Typical environments include chemical, petrochemical, waste water treatment and mining. Contaminations present in these severe environments are detrimental to conventional air-break contacts decreasing their life expectancy and reliability. The Siemens vacuum starter pump controllers are well suited for these environments because the contacts are contained in hermetically sealed contact tubes. This prevents contaminates in the atmosphere from affecting the operation of the contacts. Additionally, neither arcs nor arcing gases are produced which dramatically increases the electrical endurance of the contacts.

Pump Control Panels

Standard Pump Panel with Solid State Overload, Class 87

Selection

	Ordering Information	Coil Table	
	<ul style="list-style-type: none">▶ Field Modification Kits see page 9/104.▶ Factory Modifications see page 9/119.▶ Dimensions see page 9/169.▶ Wiring Diagrams see page 9/187.▶ Replacement Parts see page 9/131.▶ Sizes 1-4 will be supplied standard with a 240/480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table.▶ Sizes 5 & 6 will be supplied standard with a 480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table.	60Hz Voltage	Letter
		24	J
		120	F
		110–120/220–240	A ^①
		200–208	D
		220–240	G
		220–240/440–480	C ^②
		277	L
		440–480	H
		550–600	E

Fusible Disconnect

Max Hp				NEMA Size	Half Size	Overload		Disc. Amp Range	Fuse Clip Amp / Volts	Catalog Number	List Price \$
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size				
—	—	1	1	1	—	0.75–3.4 ^②	A	30	30A/600V	87DUB6FC	
—	—	5	5	1	—	3–12	A1	30	30A/600V	87DUC6FC	
—	—	10	10	1	—	5.5–22	A1	30	30A/600V	87DUD6FC	
—	—	10	10	1	—	5.5–22	A1	60	60A/600V	87DUD60C	
—	—	15	15	—	1½	10–40	A1	30	30A/600V	87EUE6FC	
—	—	15	15	—	1½	10–40	A1	60	60A/600V	87EUE60C	
—	—	25	25	2	—	13–52	B	60	60A/600V	87FUF6FC	
—	—	25	25	2	—	13–52	B	100	100A/600V	87FUF60C	
—	—	30	30	—	2½	25–100	B	60	60A/600V	87GUG6FC	
—	—	30	30	—	2½	25–100	B	100	100A/600V	87GUG60C	
—	—	50	50	3	—	25–100	B	100	100A/600V	87HUG6FC	
—	—	50	50	3	—	25–100	B	200	200A/600V	87HUG60C	
—	—	75	75	—	3½	50–200	B	200	200A/600V	87IUH6FC	
—	—	100	100	4	—	50–200	B	200	200A/600V	87JUH6FC	
—	—	200	200	5	—	55–250	—	400	400A/600V	87LPUEFH	
—	—	250	—	6	—	160–630	—	600	600A/600V	87MSW6FH	
2	2	—	—	1	—	3–12	A1	30	30A/250V	87DUC6LC	
3	3	—	—	1	—	5.5–22	A1	30	30A/250V	87DUD6LC	
7½	7½	—	—	1	—	10–40	A1	30	30A/250V	87DUE6LC	
7½	7½	—	—	1	—	10–40	A1	60	60A/250V	87DUE6PC	
10	10	—	—	—	1½	10–40	A1	60	60A/250V	87EUE6LC	
10	15	—	—	2	—	13–52	B	60	60A/250V	87FUF6LC	
10	15	—	—	2	—	13–52	B	100	100A/250V	87FUF6PC	
15	20	—	—	—	2½	25–100	B	60	60A/250V	87GUG6LC	
15	20	—	—	—	2½	25–100	B	100	100A/250V	87GUG6PC	
20	30	—	—	3	—	25–100	B	100	100A/250V	87HUG6LC	
25	30	—	—	3	—	25–100	B	200	200A/250V	87HUG6PC	
30	40	—	—	—	3½	50–200	B	200	200A/250V	87IUH6LC	
40	50	—	—	4	—	50–200	B	200	200A/250V	87JUH6LC	
75	100	—	—	5	—	55–250	—	400	400A/250V	87LPUELG	

Circuit Breaker

Max Hp				NEMA Size	Half Size	Overload		Motor Circuit Interrupter ETI Amps	Catalog Number	List Price \$
200 Volts	230 Volts	460 Volts	575 Volts			Amp Range	Frame Size			
½	½	1	1	1	—	0.75–3.4 ^②	A	3	87DUB6MC	
2	2	5	5	1	—	3–12	A1	10	87DUC6MC	
3	3	10	10	1	—	5.5–22	A1	25	87DUD6MC	
7½	7½	10	—	1	—	10–40	A1	30	87DUE6MC	
—	—	15	15	—	1½	10–40	A1	40	87EUE6MC	
10	15	25	25	2	—	13–52	B	50	87FUF6MC	
15	20	30	30	—	2½	25–100	B	100	87GUG6MC	
25	30	50	50	3	—	25–100	B	100	87HUG6MC	
30	40	75	75	—	3½	50–200	B	125	87IUH6MC	
40	50	100	100	4	—	50–200	B	150	87JUH6MC	
50	75	150	200	5	—	55–250	—	250	87LPT6MH	
75	100	200	200	5	—	55–250	—	400	87LPUEMH	
100	125	250	300	6	—	160–630	—	400	87MSW6MH	
150	200	400	400	6	—	160–630	—	600	87MSX6MH	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

① Not available on Size 5 and larger.

② For an overload amp range of 0.25–1A, change the 5th character from a 'B' to an 'A'.

③ A version with coil code A is also stocked via Controls Express.

Pump Control Panels

Pump Panel with Ambient Compensated Bimetal Overload, Class 87

Selection

Ordering Information	Coil Table																				
<ul style="list-style-type: none"> ▶ Heater elements for bimetal overloads see page 9/124 (3-Required). ▶ Field Modification Kits see page 9/104. ▶ Factory Modifications see page 9/119. ▶ Dimensions see page 9/169. ▶ Wiring Diagrams see page 9/187. ▶ Replacement Parts see page 9/131. ▶ Sizes 1-4 will be supplied standard with a 230/480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table. ▶ Sizes 5 & 6 will be supplied standard with a 480 volt coil. To change the coil voltage, change the 8th character in the catalog number to the letter shown in the coil table. 	<table> <tr> <th>60Hz Voltage</th><th>Letter</th></tr> <tr> <td>24</td><td>J</td></tr> <tr> <td>120</td><td>F</td></tr> <tr> <td>110-120/220-240</td><td>A^①</td></tr> <tr> <td>200-208</td><td>D</td></tr> <tr> <td>220-240</td><td>G</td></tr> <tr> <td>220-240/440-480</td><td>C^①</td></tr> <tr> <td>277</td><td>L</td></tr> <tr> <td>440-480</td><td>H</td></tr> <tr> <td>550-600</td><td>E</td></tr> </table>	60Hz Voltage	Letter	24	J	120	F	110-120/220-240	A ^①	200-208	D	220-240	G	220-240/440-480	C ^①	277	L	440-480	H	550-600	E
60Hz Voltage	Letter																				
24	J																				
120	F																				
110-120/220-240	A ^①																				
200-208	D																				
220-240	G																				
220-240/440-480	C ^①																				
277	L																				
440-480	H																				
550-600	E																				

Fusible Disconnect

Max HP	230V	460V	575V	NEMA Size	Half Size	Disc Amp Rating	Fuse Clip Amps/Volts	Catalog Number	List Price \$
200V									
—	—	10	10	1	—	30	30A/600V	87DAE6FC	
—	—	10	10	1	—	60	60A/600V	87DAE60C	
—	—	15	15	—	1¼	30	30A/600V	87EAF6FC	
—	—	15	15	—	1¼	60	60A/600V	87EAF60C	
—	—	25	25	2	—	60	60A/600V	87FAJ6FC	
—	—	25	25	2	—	100	100A/600V	87FAJ60C	
—	—	30	30	—	2½	60	60A/600V	87GAK6FC	
—	—	30	30	—	2½	100	100A/600V	87GAK60C	
—	—	50	50	3	—	100	100A/600V	87HAN6FC	
—	—	50	50	3	—	200	200A/600V	87HAN60C	
—	—	75	75	—	3½	200	200A/600V	87IAP6FC	
—	—	100	100	4	—	200	200A/600V	87JAR6FC	
7½	7½	—	—	1	—	30	30A/250V	87DAE6LC	
7½	7½	—	—	1	—	60	60A/250V	87DAE6PC	
10	10	—	—	—	1¼	60	60A/250V	87EAG6LC	
10	15	—	—	2	—	60	60A/250V	87FAJ6LC	
10	15	—	—	2	—	100	100A/250V	87FAJ6PC	
15	20	—	—	—	2½	100	100A/250V	87GAL6LC	
25	30	—	—	3	—	100	100A/250V	87HAN6LC	
25	30	—	—	3	—	200	200A/250V	87HAN6PC	
30	40	—	—	—	3½	200	200A/250V	87IAP6LC	
40	50	—	—	4	—	200	200A/250V	87JAR6LC	

Circuit Breaker

Max HP	230V	460V	575V	NEMA Size	Half Size	Motor Circuit Interrupter ETI Amps	Catalog Number	List Price \$
200V								
½	½	1	1	1	—	3	87DAA6MC	
1	1	3	3	1	—	10	87DAB6MC	
3	3	7½	7½	1	—	25	87DAD6MC	
7½	7½	10	10	1	—	30	87DAE6MC	
7½	7½	15	15	—	1¼	40	87EAF6MC	
10	10	—	—	—	1¼	50	87EAG6MC	
—	—	15	20	2	—	40	87FAH6MC	
10	15	25	25	2	—	50	87FAJ6MC	
—	—	30	30	—	2½	50	87GAK6MC	
15	20	—	—	—	2½	100	87GAL6MC	
25	30	50	50	3	—	100	87HAN6MC	
30	40	75	75	—	3½	125	87IAP6MC	
40	50	100	100	4	—	150	87JAR6MC	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

① Not available on Size 5 or above.

Vacuum Break and Oil Well Pump Control Panels, Class 87

Selection

Ordering Information	Coil Table																
<ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/169. ► Wiring Diagrams see page 9/187. ► Replacement Parts see page 9/131. ► Replace the (*) in the catalog number with a letter from the coil table. ► Refer to page 17-49 for information on the 958L OLR 	<table> <tr> <th>60Hz Voltage</th><th>Letter</th></tr> <tr> <td>24</td><td>J</td></tr> <tr> <td>120</td><td>F</td></tr> <tr> <td>200-208</td><td>D</td></tr> <tr> <td>220-240</td><td>G</td></tr> <tr> <td>277</td><td>L</td></tr> <tr> <td>440-480</td><td>H</td></tr> <tr> <td>550-600</td><td>E</td></tr> </table>	60Hz Voltage	Letter	24	J	120	F	200-208	D	220-240	G	277	L	440-480	H	550-600	E
60Hz Voltage	Letter																
24	J																
120	F																
200-208	D																
220-240	G																
277	L																
440-480	H																
550-600	E																

Vacuum Break Pump Control Panels (Vacuum Contactor with Trip Class 10 Solid-State Overload Relay)

Max Hp		NEMA Size	Overload Relay Range	Fusible Disconnect			Circuit Breaker		
480 Volts	575 Volts			Fuse Clip Amps/Volts	Catalog Number	List Price \$	MCI Amps	Catalog Number	List Price \$
100	100	4	55-250A	200A/600V	87JCM4F*		250A	87JCM4M*	
200	200	5	55-250A	400A/600V	87LCU4F*		400A	87LCT4M*	
250	300	6	160-630A	—	—		400A	87MCW4M*	
400	400	6	160-630A	—	—		600A	87MCX4M*	

Oil Well Pump Control Panels (Open Air Contactor with 958L Solid-State Overload Relay)

Max Hp		NEMA Size	Overload Relay Range	Fusible Disconnect			Circuit Breaker		
480 Volts	575 Volts			Fuse Clip Amps/Volts	Catalog Number	List Price \$	MCI Amps	Catalog Number	List Price \$
25	25	2	13-52	60A/600V	87FPI6F*		50	87FPI6M*	
50	50	3	25-100	100A/600V	87HPK6F*		100	87HPK6M*	
100	100	4	50-200	200A/600V	87JPM6F*		150	87JPM6M*	

Note: Hp's shown above are based on the overload amp range for the FLA's (per the National Electric Code) of typical industrial motors. All starter sizes carry one maximum Hp rating.

Reduced Voltage Pump Panels

Auto Transformer & Part winding (2 Step) with Solid State Overload, Class 88

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> ▶ Field Modification Kits see page 9/104. ▶ Factory Modifications see page 9/119. ▶ Dimensions see page 9/169. ▶ Wiring Diagrams see pages 9/180 and 9/181. ▶ Replacement Parts see page 9/131. 	<p>The coil voltage on the contactors will be the motor voltage. A CPT will be supplied to provide the control voltage. The control voltage will be 120V.</p> <p>To change the control voltage to customer supplied (no CPT included), change the 9th character to the following: for 24V , use "J" for 120V, use "F"</p>

Auto Transformer Type

Motor Voltage	Max Hp	Overload		NEMA Size	Half Size	Fusible Disconnect			Circuit Breaker		
		Amp Range	Frame Size			Fuse Clip Size Amps/Volts	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
230	15	13-52	B	2	—	60A/250V	88FUFT2FG		50	88FUFT2MG	
	20	25-100	B	—	2½	100A/250V	88GUGT2FG		100	88GUGT2MG	
	30	25-100	B	3	—	100A/250V	88HUGT2FG		100	88HUGT2MG	
	40	50-200	B	—	3½	200A/250V	88IUHT2FG		125	88IUHT2MG	
	50	50-200	B	4	—	200A/250V	88JUHT2FG		150	88JUHT2MG	
	75	55-250	—	5	—	—	—		250	88LPST2MG	
	100	55-250	—	5	—	400A/250V	88LPUT2FG		400	88LPUT2MG	
	200	160-630	—	6	—	—	—		600	88MSXT2MG	
460	25	13-52	B	2	—	60A/600V	88FUFT4FH		50	88FUFT4MH	
	30	25-100	B	—	2½	60A/600V	88GUGT4FH		50	88GUGT4MH	
	50	25-100	B	3	—	100A/600V	88HUGT4FH		100	88HUGT4MH	
	75	50-200	B	—	3½	200A/600V	88IUHT4FH		125	88IUHT4MH	
	100	50-200	B	4	—	200A/600V	88JUHT4FH		150	88JUHT4MH	
	150	55-250	—	5	—	—	—		250	88LPST4MH	
	200	55-250	—	5	—	400A/600V	88LPST4FH		400	88LPUT4MH	
	250	160-630	—	6	—	—	—		400	88MSVT4MH	
	400	160-630	—	6	—	600A/600V	88MSXT4FH		600	88MSXT4MH	

Part Winding 2 Step

Motor Voltage	Max Hp	Overload		NEMA Size	Half Size	Fusible Disconnect			Circuit Breaker		
		Amp Range	Frame Size			Fuse Clip Size Amps/Volts	Catalog Number	List Price \$	Circuit Breaker Amps	Catalog Number	List Price \$
230	20	10-40	A1	—	1½	100A/250V	88EUEP2FG		100	88EUEP2MG	
	25	13-52	B	2	—	100A/250V	88FUPP2FG		100	88FUPP2MG	
	40	25-100	B	—	2½	200A/250V	88GUGP2FG		100	88GUGP2MG	
	50	25-100	B	3	—	200A/250V	88HUGP2FG		150	88HUGP2MG	
	60	50-200	B	—	3½	200A/250V	88IUHP2FG		250	88IUHP2MG	
	75	50-200	B	4	—	400A/250V	88JUHP2FG		250	88JUHP2MG	
	125	55-250	—	5	—	—	—		400	88LPSP2MG	
	150	55-250	—	5	—	600A/250V	88LPUP2FG		600	88LPUP2MG	
460	30	10-40	A1	—	1½	100A/600V	88EUEP4FH		100	88EUEP4MH	
	40	13-52	B	2	—	100A/600V	88FUPP4FH		100	88FUPP4MH	
	60	25-100	B	—	2½	200A/600V	88GUGP4FH		100	88GUGP4MH	
	75	25-100	B	3	—	200A/600V	88HUGP4FH		150	88HUGP4MH	
	100	50-200	B	—	3½	200A/600V	88IUHP4FH		250	88IUHP4MH	
	150	50-200	B	4	—	400A/600V	88JUHP4FH		250	88JUHP4MH	
	250	55-250	—	5	—	—	—		400	88LPSP4MH	
	350	55-250	—	5	—	600A/600V	88LPUP4FH		600	88LPUP4MH	

Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Reduced Voltage Pump Panels

Wye Delta with Solid State Overload, Class 88

Selection

Ordering Information	Coil and Control Voltage
<ul style="list-style-type: none"> ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/169. ► Wiring Diagrams see pages 9/182 and 9/183. ► Replacement Parts see page 9/131. 	<p>The coil voltage on the contactors will be the motor voltage. A CPT will be supplied to provide the control voltage. The control voltage will be 120V.</p> <p>To change the control voltage to customer supplied (no CPT included), change the 9th character to the following: for 24V, use "J" for 120V, use "F"</p>

Wye Delta

Motor Voltage	Max Hp	Overload		NEMA Size	Half Size	Fuse Clip Size Amps/Volts	Motor Circuit Interruter ETI Amps	Open Transition				Closed Transition			
		Amp Range	Frame Size					Fusible Disconnect		Circuit Breaker		Fusible Disconnect		Circuit Breaker	
								Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
200	10	10-40	A1	1	—	60A/250V	50	88DUE06FD		88DUE06MD		88DUEC6FD		88DUEC6MD	
	15	10-40	A1	—	1½	100A/250V	100	88EUE06FD		88EUE06MD		88EUEC6FD		88EUEC6MD	
	20	13-52	B	2	—	100A/250V	100	88FUF06FD		88FUF06MD		88FUC6FD		88FUC6MD	
	30	25-100	B	—	2½	200A/250V	125	88GUG06FD		88GUG06MD		88GUC6FD		88GUC6MD	
	40	25-100	B	3	—	200A/250V	150	88HUG06FD		88HUG06MD		88HUC6FD		88HUC6MD	
	50	50-200	B	—	3¾	200A/250V	250	88IUH06FD		88IUH06MD		88IHC6FD		88IHC6MD	
	60	50-200	B	4	—	400A/250V	250	88JUH06FD		88JUH06MD		88JHC6FD		88JHC6MD	
	75	55-250	—	5	—	400A/250V	400	88LPS06FD		88LPS06MD		88LPC6FD		88LPC6MD	
	150	55-250	—	5	—	600A/250V	600	88LPU06FD		88LPU06MD		88LPC6FD		88LPC6MD	
300	160-630	—	6	—	—	800	—		88MSX06MD		—		88MSXC6MD		
230	10	10-40	A1	1	—	60A/250V	50	88DUE02FG		88DUE02MG		88DUEC2FG		88DUEC2MG	
	15	10-40	A1	—	1½	60A/250V	50	88EUE02FG		88EUE02MG		88EUEC2FG		88EUEC2MG	
	25	13-52	B	2	—	100A/250V	100	88FUF02FG		88FUF02MG		88FUC2FG		88FUC2MG	
	30	25-100	B	—	2½	200A/250V	100	88GUG02FG		88GUG02MG		88GUC2FG		88GUC2MG	
	50	25-100	B	3	—	200A/250V	150	88HUG02FG		88HUG02MG		88HUC2FG		88HUC2MG	
	60	50-200	B	—	3¾	200A/250V	250	88IUH02FG		88IUH02MG		88IHC2FG		88IHC2MG	
	75	50-200	B	4	—	400A/250V	250	88JUH02FG		88JUH02MG		88JHC2FG		88JHC2MG	
	100	55-250	—	5	—	400A/250V	400	88LPS02FG		88LPS02MG		88LPC2FG		88LPC2MG	
	150	55-250	—	5	—	600A/250V	600	88LPU02FG		88LPU02MG		88LPC2FG		88LPC2MG	
350	160-630	—	6	—	—	1200	—		88MSX02MG		—		88MSXC2MG		
460	15	5.5-22	A1	1	—	30A/600V	30	88DUD04FH		88DUD04MH		88DUDC4FH		88DUDC4MH	
	30	10-40	A1	—	1½	60A/600V	50	88EUE04FH		88EUE04MH		88EUEC4FH		88EUEC4MH	
	40	13-52	B	2	—	100A/600V	100	88FUF04FH		88FUF04MH		88FUC4FH		88FUC4MH	
	60	25-100	B	—	2½	200A/600V	100	88GUG04FH		88GUG04MH		88GUC4FH		88GUC4MH	
	75	25-100	B	3	—	200A/600V	125	88HUG04FH		88HUG04MH		88HUC4FH		88HUC4MH	
	100	50-200	B	—	3¾	200A/600V	150	88IUH04FH		88IUH04MH		88IHC4FH		88IHC4MH	
	150	50-200	B	4	—	400A/600V	250	88JUH04FH		88JUH04MH		88JHC4FH		88JHC4MH	
	200	55-250	—	5	—	400A/600V	400	88LPS04FH		88LPS04MH		88LPC4FH		88LPC4MH	
	300	55-250	—	5	—	600A/600V	600	88LPU04FH		88LPU04MH		88LPC4FH		88LPC4MH	
700	160-630	—	6	—	—	1200	—		88MSX04MH		—		88MSXC4MH		
575	15	5.5-22	A1	1	—	30A/600V	30	88DUD05FE		88DUD05ME		88DUDC5FE		88DUDC5ME	
	30	10-40	A1	—	1½	60A/600V	50	88EUE05FE		88EUE05ME		88EUEC5FE		88EUEC5ME	
	40	13-52	B	2	—	100A/600V	50	88FUF05FE		88FUF05ME		88FUC5FE		88FUC5ME	
	60	25-100	B	—	2½	200A/600V	100	88GUG05FE		88GUG05ME		88GUC5FE		88GUC5ME	
	75	25-100	B	3	—	200A/600V	125	88HUG05FE		88HUG05ME		88HUC5FE		88HUC5ME	
	100	50-200	B	—	3¾	200A/600V	150	88IUH05FE		88IUH05ME		88IHC5FE		88IHC5ME	
	150	50-200	B	4	—	400A/600V	250	88JUH05FE		88JUH05ME		88JHC5FE		88JHC5ME	
	200	55-250	—	5	—	400A/600V	400	88LPS05FE		88LPU05ME		88LPC5FE		88LPC5ME	
	300	55-250	—	5	—	600A/600V	400	88LPU05FE		88LPU05ME		88LPC5FE		88LPC5ME	
700	160-630	—	6	—	—	1200	—		88MSX05ME		—		88MSXC5ME		

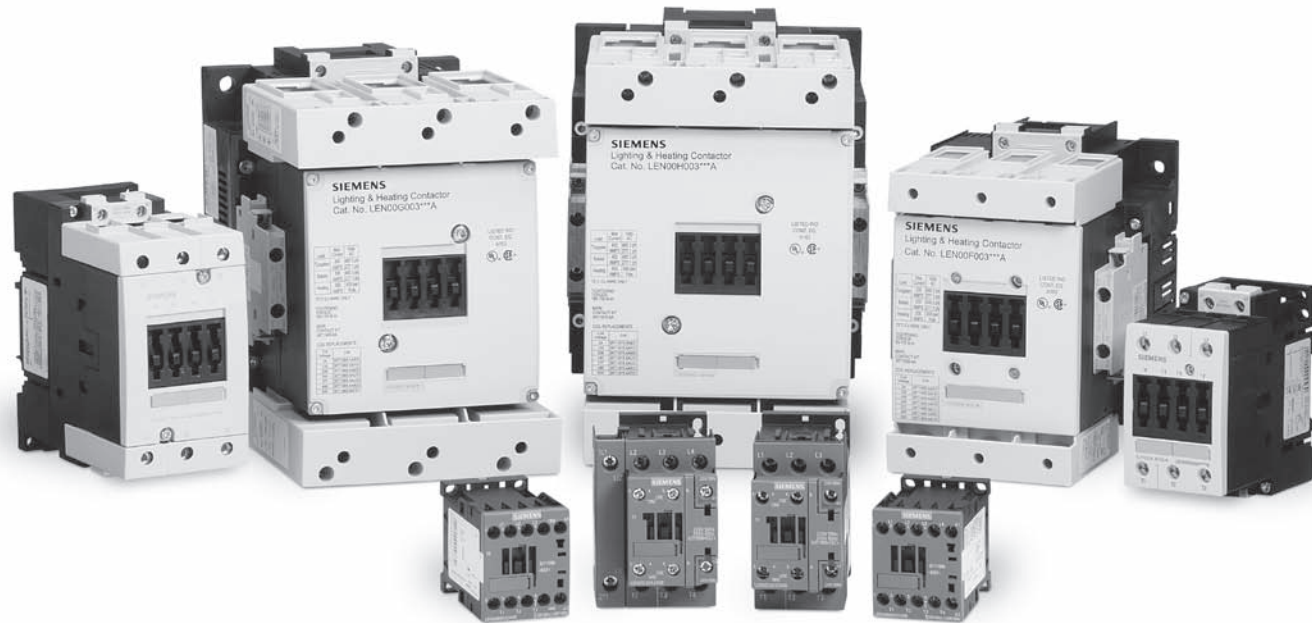
Note: All starter sizes carry one maximum Hp rating (per the National Electric Code).

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

Features

Simplicity and compact lightweight design makes Class LE lighting contactors an attractive solution to your budgeting challenges.



- Used in applications where it is not critical that contacts remain closed if control power is lost
- Rated for tungsten lighting (incandescent filament), ballast lighting (fluorescent, HID, metal halide, mercury vapor, quartz halogen and sodium-lamp), resistive and general use loads
- Contacts are rated 20 - 400 amps at 600 volts
- 3 and 4 pole (up to 12 pole for 30 and 60 amp contactors)
- Most contactors have built-in auxiliary contacts for convenient 3-wire control
- Wide range of coil voltages from 24 to 600 VAC 50/60Hz
- Compact design allows for smaller panels and more wiring room
- Finger and back-of-hand safe terminals
- Panel and DIN rail mounting
- Full line of enclosures including NEMA 1, 3/3R, 4, 4/4X stainless steel and 12
- Available in combination form with choice of non-fusible disconnect, fusible disconnect or circuit breaker
- Full line of factory and field modifications

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

Features

Catalog Numbering System

	LE					0			
Disconnect Type									
B = Combination Circuit Breaker D = Combination Non-Fused Disconnect F = Combination Fusible Disconnect N = Non-Combination									
Disconnect Rating									
0 = N/A A = 30A/250V Disconnect B = 30A/600V Disconnect C = 60A/250V Disconnect D = 60A/600V Disconnect E = 100A/250V Disconnect F = 100A/600V Disconnect G = 200A/250V Disconnect H = 200A/600V Disconnect J = 400A/250V Disconnect K = 400A/600V Disconnect T = 20A Circuit Breaker V = 30A Circuit Breaker Y = 60A Circuit Breaker Z = 100A Circuit Breaker									
Enclosure Type									
0 = Open 1 = NEMA 1 2 = NEMA 12/3R 4 = NEMA 4/4X SS									
Contactor Rating (Amp)									
B = 20 C = 30 D = 60 E = 100 F = 200 G = 300 H = 400									
N.C. Poles									
0 = None									
N.O. Poles									
03 = Three 04 = Four 06 = Six 09 = Nine 12 = Twelve									
Coil Voltage (AC 60Hz)									
024 = 24 120 = 120 208 = 208 240 = 240 277 = 277 347 = 347 480 = 480 600 = 600									
Series									
A = 200 – 400A Contactors B = 20 – 100A Contactors									



Ordering Information

- Replace *** with a number from the coil table.
- Field Modification Kits see page 9/104.
- Factory Modifications see page 9/119.
- Dimensions see page 9/149 for open, page 9/170 for enclosed.
- Wiring Diagram see page 9/188.
- Replacement Parts see page 9/134.

Coil Table

VAC 60Hz	***
24	024
120	120
208	208
240	240
277	277
347 ¹⁾	347
480	480
600	600

Replace the (***) with a number from the coil table.

Non-Combination Contactor

Max. Amp Rating	Number of Poles	Normally Closed Contacts	Normally Open Contacts	Enclosure Type			
				Open	1	3/3R/12 ²⁾	4/4X 304 S.S.
				Catalog Number			
20	3	0	3	LEN00B003***B	LEN01B003***B	LEN02B003***B	LEN04B003***B
	4	0	4	LEN00B004***B	LEN01B004***B	LEN02B004***B	LEN04B004***B
30	3	0	3	LEN00C003***B	LEN01C003***B	LEN02C003***B	LEN04C003***B
	4	0	4	LEN00C004***B	LEN01C004***B	LEN02C004***B	LEN04C004***B
	6	0	6	LEN00C006***B	LEN01C006***B	LEN02C006***B	LEN04C006***B
	9	0	9	LEN00C009***B	LEN01C009***B	LEN02C009***B	LEN04C009***B
	12	0	12	LEN00C012***B	LEN01C012***B	LEN02C012***B	LEN04C012***B
60	3	0	3	LEN00D003***B	LEN01D003***B	LEN02D003***B	LEN04D003***B
	6	0	6	LEN00D006***B	LEN01D006***B	LEN02D006***B	LEN04D006***B
	9	0	9	LEN00D009***B	LEN01D009***B	LEN02D009***B	LEN04D009***B
	12	0	12	LEN00D012***B	LEN01D012***B	LEN02D012***B	LEN04D012***B
100	3	0	3	LEN00E003***B	LEN01E003***B	LEN02E003***B	LEN04E003***B
200	3	0	3	LEN00F003***A	LEN01F003***A	LEN02F003***A	LEN04F003***A
300	3	0	3	LEN00G003***A	LEN01G003***A	LEN02G003***A	LEN04G003***A
400	3	0	3	LEN00H003***A	LEN01H003***A	LEN02H003***A	LEN04H003***A

¹⁾ Not available on 200 - 400A contactors.

²⁾ Type 12 field convertible to type 3/3R.

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

Technical Data

Contactor	LEN00B003	LEN00B004	LEN00C003	LEN00C004
General technical data:				
Finger-safe (main circuit / control circuit)	yes / yes	yes / yes	yes / yes	yes / yes
Degree of pollution	3	3	3	3
Altitude (m)	2,000	2,000	2,000	2,000
Ambient storage temperature (°C)	-55 to 80	-55 to 80	-55 to 80	-55 to 80
Ambient operating temperature (°C)	0 to 40	0 to 40	0 to 40	0 to 40
Humidity (% non-condensing)	10 to 95	10 to 95	10 to 95	10 to 95
Shock resistance at rectangular impulse (g/ms)	6.7 / 5, 4.2 / 10	6.7 / 5, 4.2 / 10	7.5 / 5, 4.7 / 10	7.5 / 5, 4.7 / 10
Shock resistance at sine pulse (g/ms)	10.5 / 5, 6.6 / 10	10.5 / 5, 6.6 / 10	11.8 / 5, 7.4 / 10	11.8 / 5, 7.4 / 10
Rated impulse voltage resistance (kV)	no data	no data	no data	no data
Rated insulation voltage (V)	no data	no data	no data	no data
Mechanical operating cycles as operating time:				
of contactor	30,000,000	30,000,000	10,000,000	10,000,000
of contactor with additional aux contacts	10,000,000	10,000,000	10,000,000	10,000,000
Main circuit:				
Number of NC / NO main contacts	0NC / 3NO	0NC / 4NO	0NC / 3NO	0NC / 4NO
Typical power loss per conductor (W)	0.7	0.7	0.9	0.9
Off-load operating frequency (cycles per hour)	10,000	10,000	5,000	5,000
Current ratings:				
Tungsten (poles per phase)	20A @277V 1p 1ph 20A @480V 2p 1ph 20A @480V 3p 3ph	20A @277V 1p 1ph 20A @480V 2p 1ph 20A @480V 3p 3ph	30A @277V 1p 1ph 30A @480V 2p 1ph 30A @480V 3p 3ph	30A @277V 1p 1ph 30A @480V 2p 1ph 30A @480V 3p 3ph
Ballast (poles per phase)	20A @347V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	20A @347V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	30A @347V 1p 1ph 30A @600V 2p 1ph 30A @660V 3p 3ph	30A @347V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
General and resistive (poles per phase)	20A @600V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	20A @600V 1p 1ph 20A @600V 2p 1ph 20A @600V 3p 3ph	30A @600V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph	30A @600V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
Coil ratings:				
Nominal voltage	2)	2)	2)	2)
Inrush / sealed power (VA)	31.7 / 4.8	31.7 / 4.8	87 / 9.4	87 / 9.4
Coil voltage tolerance factor	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1
Internal/standard auxiliary contact:				
Number of NC / NO auxiliary contacts	0NC / 1NO	NA ^①	1NC / 1NO	1NC / 1NO
Rating	A600 / Q600	NA	A600 / Q600	A600 / Q600
Installation/mounting/dimensions:				
Mounting orientation	vertical	vertical	vertical	vertical
Type of mounting: screw / DIN rail	yes / yes	yes / yes	yes / yes	yes / yes
Height x Width x Depth (mm)	57.5 x 45 x 73	57.5 x 45 x 73	85 x 45 x 97	85 x 60 x 97
Minimum clearance to sides (mm)	0	0	0	0
Minimum clearance to earthed parts (mm)	6	6	6	6
Connection type / torque for main circuit terminals	screw / 7-10 lb in	screw / 7-10 lb in	screw / 18-22 lb in	screw / 18-22 lb in
Connection type / torque for control circuit terminals	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in
Solid and stranded conductors for main contacts (AWG)	2x(20-16), 2x(18-14), 2x(12)	2x(20-16), 2x(18-14), 2x(12)	2x(6-12), 2x(14-8)	2x(6-12), 2x(14-8)
Solid and stranded conductors for control circuit (AWG)	2x(20-16), 2x(18-14)	2x(20-16), 2x(18-14)	2x(20-16), 2x(18-14)	2x(20-16), 2x(18-14)
Conductor type for main and control circuits	75°C CU	75°C CU	75°C CU	75°C CU
Short circuit current rating of main circuit:				
Short circuit current rating	5kA @ 600V	5kA @ 600V	5kA @ 600V	5kA @ 600V
Max fuse / circuit breaker (Amp)	30 / 25	30 / 25	60 / 40	60 / 40
Certificates:	cULus	cULus	cULus	cULus

① Must use an external (optional) auxiliary contact.

2) Refer to catalog selection tables for coil voltages.

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

Technical Data

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LEN00D003	LEN00E003	LEN00F003	LEN00G003	LEN00H003
no / yes	no / yes	no / yes	no / yes	no / yes
3	3	3	3	3
2,000	2,000	2,000	2,000	2,000
-55 to 80	-55 to 80	-55 to 80	-55 to 80	-55 to 80
0 to 40	0 to 40	0 to 40	0 to 40	0 to 40
10 to 95	10 to 95	10 to 95	10 to 95	10 to 95
10 / 5, 5 / 10	6.8 / 5, 4 / 10	8.5 / 5, 4.2 / 10	8.5 / 5, 4.2 / 10	8.5 / 5, 4.2 / 10
15 / 5, 8 / 10	10.6 / 5, 6.2 / 10	13.4 / 5, 6.5 / 10	13.4 / 5, 6.5 / 10	13.4 / 5, 6.5 / 10
no data	no data	no data	no data	no data
no data	no data	no data	no data	no data
Mechanical operating cycles as operating time:				
10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Main circuit:				
ONC / 3NO	ONC / 3NO	ONC / 3NO	ONC / 3NO	ONC / 3NO
2.6	7.7	13	18	35
5,000	5,000	2,000	2,000	2,000
Current ratings:				
60A @277V 1p 1ph 60A @480V 2p 1ph 60A @480V 3p 3ph	100A @277V 1p 1ph 100A @480V 2p 1ph 100A @480V 3p 3ph	200A @277V 1p 1ph 200A @480V 2p 1ph 200A @480V 3p 3ph	300A @277V 1p 1ph 300A @480V 2p 1ph 300A @480V 3p 3ph	400A @277V 1p 1ph 400A @480V 2p 1ph 400A @480V 3p 3ph
60A @600V 1p 1ph 60A @600V 2p 1ph 60A @600V 3p 3ph	100A @600V 1p 1ph 100A @600V 2p 1ph 100A @600V 3p 3ph	200A @600V 1p 1ph 200A @600V 2p 1ph 200A @600V 3p 3ph	300A @600V 1p 1ph 300A @600V 2p 1ph 300A @600V 3p 3ph	400A @600V 1p 1ph 400A @600V 2p 1ph 400A @600V 3p 3ph
60A @600V 1p 1ph 60A @600V 2p 1ph 60A @600V 3p 3ph	100A @600V 1p 1ph 100A @600V 2p 1ph 100A @600V 3p 3ph	200A @600V 1p 1ph 200A @600V 2p 1ph 200A @600V 3p 3ph	300A @600V 1p 1ph 300A @600V 2p 1ph 300A @600V 3p 3ph	400A @600V 1p 1ph 400A @600V 2p 1ph 400A @600V 3p 3ph
Coil ratings:				
2)	2)	2)	2)	2)
166 / 12.6	300 / 21	300 / 5.8	590 / 6.7	830 / 9.2
0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1
Internal/standard auxiliary contact:				
NA ⊕	NA ⊕	2NC / 2NO	2NC / 2NO	2NC / 2NO
NA	NA	A300 / Q300	A300 / Q300	A300 / Q300
Installation/mounting/dimensions:				
vertical	vertical	vertical	vertical	vertical
yes / yes	yes / yes	yes / no	yes / no	yes / no
112 x 55 x 115	146 x 70 x 139	172 x 120 x 180	210 x 145 x 202	214 x 160 x 225
6	6	10	10	10
6	6	10	10	10
screw / 27-40 lb in	screw / 36-53 lb in	screw / 90-110 lb in	screw / 180-195 lb in	screw / 180-195 lb in
screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in	screw / 7-10 lb in
2x(18-3), 1x(18-2)	2x(10-1/0), 1x(10-2/0)	2x(6-3/0)	2x(2/0-500MCM)	2x(2/0-500MCM)
2x(18-14)	2x(18-14)	2x(18-14)	2x(18-14)	2x(18-14)
75°C CU	75°C CU	75°C CU	75°C CU	75°C CU
Short circuit current rating of main circuit:				
5kA @ 600V	10kA @ 600V	10kA @ 600V	18kA @ 600V	18kA @ 600V
100 / 80	200 / 125	400 / 250	600 / 400	800 / 500
cULus	cULus	cULus	cULus	cULus

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LE

• Revised •
09/18/15

Selection

	Ordering Information		Coil Table	
	<ul style="list-style-type: none"> ► Replace *** with a number from the coil table. ► Field Modification Kits see page 9/104. ► Factory Modifications see page 9/119. ► Dimensions see page 9/170. ► Wiring Diagram see page 9/188. ► Replacement Parts see page 9/134. 		VAC 60Hz	***
			24	024
			120	120
			208	208
			240	240
			277	277
			347 ^①	347
			480	480
			600	600
			Replace the (***) with a number from the coil table.	

Combination Contactor

Disconnect Type	Max. Amp Rating	Number of NO Poles	Disc. Amp Rating	Disc Amp/ Fuse Clip Rating	Circuit Breaker Rating	Enclosure Type		
						1	3/3R/12 ^② , 4 ^③	4/4X 304 S.S.
						Catalog Number		
Non-Fusible	20	3	30A	—	—	LEDB1B003***B	LEDB2B003***B	LEDB4B003***B
	30	3	30A	—	—	LEDB1C003***B	LEDB2C003***B	LEDB4C003***B
	60	3	60A	—	—	LEDD1D003***B	LEDD2D003***B	LEDD4D003***B
	100	3	100A	—	—	LEDF1E003***B	LEDF2E003***B	LEDF4E003***B
	200	3	200A	—	—	LEDH1F003***A	LEDH2F003***A	LEDH4F003***A
	300	3	400A	—	—	LEDK1G003***A	LEDK2G003***A	LEDK4G003***A
Fusible	20	3	—	30A/250V	—	LEFA1B003***B	LEFA2B003***B	LEFA4B003***B
		3	—	30A/600V	—	LEFB1B003***B	LEFB2B003***B	LEFB4B003***B
	30	3	—	30A/250V	—	LEFA1C003***B	LEFA2C003***B	LEFA4C003***B
		3	—	30A/600V	—	LEFB1C003***B	LEFB2C003***B	LEFB4C003***B
	60	3	—	60A/250V	—	LEFC1D003***B	LEFC2D003***B	LEFC4D003***B
		3	—	60A/600V	—	LEFD1D003***B	LEFD2D003***B	LEFD4D003***B
	100	3	—	100A/250V	—	LEFE1E003***B	LEFE2E003***B	LEFE4E003***B
		3	—	100A/600V	—	LEFF1E003***B	LEFF2E003***B	LEFF4E003***B
	200	3	—	200A/250V	—	LEFG1F003***A	LEFG2F003***A	LEFG4F003***A
		3	—	200A/600V	—	LEFH1F003***A	LEFH2F003***A	LEFH4F003***A
	300	3	—	400A/250V	—	LEFJ1G003***A	LEFJ2G003***A	LEFJ4G003***A
		3	—	400A/600V	—	LEFK1G003***A	LEFK2G003***A	LEFK4G003***A
Circuit Breaker	20	3	—	—	20A	LEBT1B003***B	LEBT2B003***B	LEBT4B003***B
	30	3	—	—	30A	LEBV1C003***B	LEBV2C003***B	LEBV4C003***B
	60	3	—	—	60A	LEBY1D003***B	LEBY2D003***B	LEBY4D003***B
	100	3	—	—	100A	LEBZ1E003***B	LEBZ2E003***B	LEBZ4E003***B

① Not available on 200 - 400A contactors.

② Type 12 field convertible to type 3/3R.

③ Type 4 painted enclosure through 100 Amp only.

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LC

Features

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Class LC lighting contactors deliver unprecedented versatility in application, simplicity in configuration and performance in operation. Ingenious design, rugged construction and a host

of truly useful features make them uniquely appealing to all those who use them.

Convenient side access
field power wiring.

Contact position indication – when
button protrudes, contact is closed

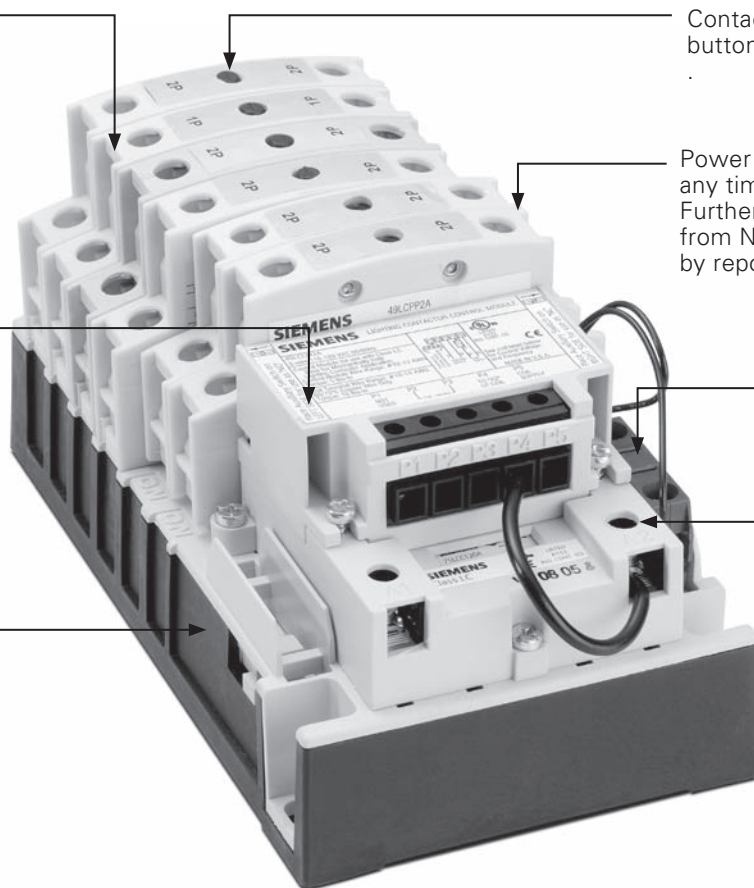
Power poles can easily be added at
any time based on changing needs.
Furthermore, they may be converted
from NO to NC (or vice versa) simply
by repositioning.

A simple kit easily
converts electrically held
units to mechanically
held and includes a 2-
or 3-wire control module.

Plug-in auxiliary contacts
are NO when installed on
the left side of the contactor,
NC on the right.

Standard base enables
contactor to be field
expandable for flexibility
and future needs.

Finger and back-of-hand
safe terminals.



- Used in all applications where either electrically or mechanically held contactors are specifically suited and also ideal for maximum flexibility and future expansion
- Rated for tungsten lighting (incandescent filament), ballast lighting (fluorescent, HID, metal halide, mercury vapor, quartz halogen and sodium-lamp), resistive and general use loads
- Contacts are rated up to 30 amps at 600 volts
- Up to 12 poles (maximum of 8 normally closed)
- Wide range of coil voltages from 24 to 600 VAC 50/60Hz

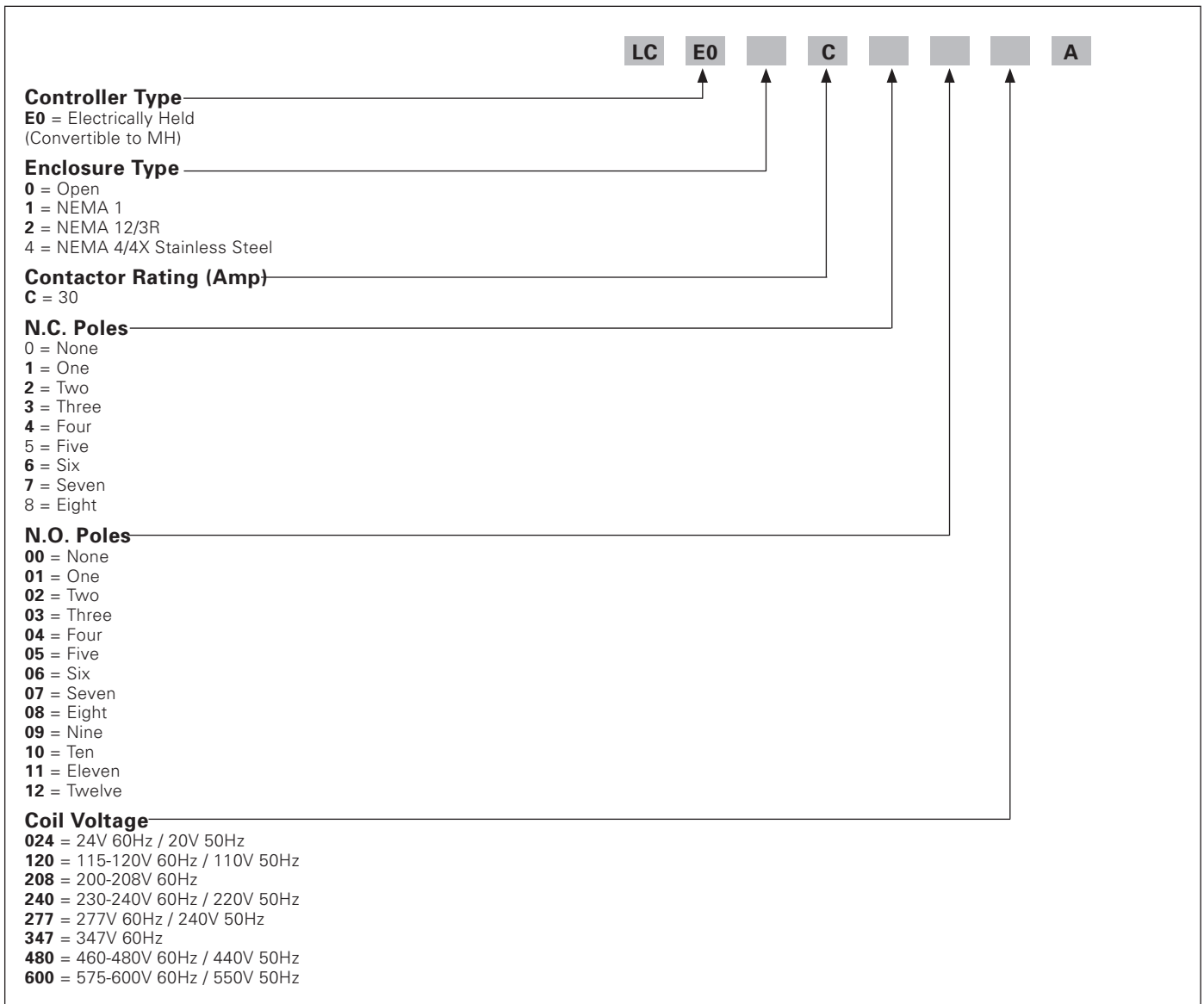
- Can be ordered as either electrically or mechanically held and can also be converted from electrically to mechanically held in the field with a simple conversion kit
- Modular design enables you to stock the building block components to assemble all configurations of both the electrically and mechanically held contactors thus dramatically reducing inventory
- Full line of enclosures including NEMA 1, 3/3R, 4, 4/4X stainless steel and 12
- Full line of factory and field modifications

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LC

Features

Catalog Numbering System





Ordering Information

- To order standard electrically held contactor, simply select catalog number from tables below.
- To order mechanically held contactor, select catalog number from tables below and specify conversion module from factory modification section from page 9/122.
- To convert standard electrically held contactor to mechanically held in the field, select catalog number from tables below and select conversion module kit from field modification section on page 9/106.
- Replace *** with a number from the coil table.
- Field Modification Kits see page 9/104.
- Factory Modifications see page 9/119.
- Dimensions see page 9/148 open, page 9/170 enclosed.
- Wiring Diagrams see page 9/188.
- Replacement Parts see page 9/134.

Coil Table

VAC 60Hz	***
24	024
120	120
208	208
240	240
277	277
347	347
480	480
600	600

Replace the (***) with a number from the coil table.

Non-Combination Contactor (30 Amp max.)

No. of Poles		Enclosure Type			
		Open	1	3/3R/12 ^①	4/4X 304 S.S.
N.C.	N.O.	Catalog Number			
2	0	LCE00C200***A	LCE01C200***A	LCE02C200***A	LCE04C200***A
3		LCE00C300***A	LCE01C300***A	LCE02C300***A	LCE04C300***A
4		LCE00C400***A	LCE01C400***A	LCE02C400***A	LCE04C400***A
5		LCE00C500***A	LCE01C500***A	LCE02C500***A	LCE04C500***A
6		LCE00C600***A	LCE01C600***A	LCE02C600***A	LCE04C600***A
7		LCE00C700***A	LCE01C700***A	LCE02C700***A	LCE04C700***A
8		LCE00C800***A	LCE01C800***A	LCE02C800***A	LCE04C800***A
1	1	LCE00C101***A	LCE01C101***A	LCE02C101***A	LCE04C101***A
2		LCE00C201***A	LCE01C201***A	LCE02C201***A	LCE04C201***A
3		LCE00C301***A	LCE01C301***A	LCE02C301***A	LCE04C301***A
4		LCE00C401***A	LCE01C401***A	LCE02C401***A	LCE04C401***A
5		LCE00C501***A	LCE01C501***A	LCE02C501***A	LCE04C501***A
6		LCE00C601***A	LCE01C601***A	LCE02C601***A	LCE04C601***A
7		LCE00C701***A	LCE01C701***A	LCE02C701***A	LCE04C701***A
8		LCE00C801***A	LCE01C801***A	LCE02C801***A	LCE04C801***A
0	2	LCE00C002***A	LCE01C002***A	LCE02C002***A	LCE04C002***A
1		LCE00C102***A	LCE01C102***A	LCE02C102***A	LCE04C102***A
2		LCE00C202***A	LCE01C202***A	LCE02C202***A	LCE04C202***A
3		LCE00C302***A	LCE01C302***A	LCE02C302***A	LCE04C302***A
4		LCE00C402***A	LCE01C402***A	LCE02C402***A	LCE04C402***A
5		LCE00C502***A	LCE01C502***A	LCE02C502***A	LCE04C502***A
6		LCE00C602***A	LCE01C602***A	LCE02C602***A	LCE04C602***A
7		LCE00C702***A	LCE01C702***A	LCE02C702***A	LCE04C702***A
8		LCE00C802***A	LCE01C802***A	LCE02C802***A	LCE04C802***A
0	3	LCE00C003***A	LCE01C003***A	LCE02C003***A	LCE04C003***A
1		LCE00C103***A	LCE01C103***A	LCE02C103***A	LCE04C103***A
2		LCE00C203***A	LCE01C203***A	LCE02C203***A	LCE04C203***A
3		LCE00C303***A	LCE01C303***A	LCE02C303***A	LCE04C303***A
4		LCE00C403***A	LCE01C403***A	LCE02C403***A	LCE04C403***A
5		LCE00C503***A	LCE01C503***A	LCE02C503***A	LCE04C503***A
6		LCE00C603***A	LCE01C603***A	LCE02C603***A	LCE04C603***A
7		LCE00C703***A	LCE01C703***A	LCE02C703***A	LCE04C703***A
8		LCE00C803***A	LCE01C803***A	LCE02C803***A	LCE04C803***A

① Type 12 field convertible to Type 3/3R.

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LC

Selection

Non-Combination Contactor (30 Amp max.)

No. of Poles		Enclosure Type			
		Open	1	3/3R/12 ①	4/4X 304 S.S.
N.C.	N.O.	Catalog Number			
0	4	LCE00C004***A	LCE01C004***A	LCE02C004***A	LCE04C004***A
1		LCE00C104***A	LCE01C104***A	LCE02C104***A	LCE04C104***A
2		LCE00C204***A	LCE01C204***A	LCE02C204***A	LCE04C204***A
3		LCE00C304***A	LCE01C304***A	LCE02C304***A	LCE04C304***A
4		LCE00C404***A	LCE01C404***A	LCE02C404***A	LCE04C404***A
5		LCE00C504***A	LCE01C504***A	LCE02C504***A	LCE04C504***A
6		LCE00C604***A	LCE01C604***A	LCE02C604***A	LCE04C604***A
7		LCE00C704***A	LCE01C704***A	LCE02C704***A	LCE04C704***A
8		LCE00C804***A	LCE01C804***A	LCE02C804***A	LCE04C804***A
0	5	LCE00C005***A	LCE01C005***A	LCE02C005***A	LCE04C005***A
1		LCE00C105***A	LCE01C105***A	LCE02C105***A	LCE04C105***A
2		LCE00C205***A	LCE01C205***A	LCE02C205***A	LCE04C205***A
3		LCE00C305***A	LCE01C305***A	LCE02C305***A	LCE04C305***A
4		LCE00C405***A	LCE01C405***A	LCE02C405***A	LCE04C405***A
5		LCE00C505***A	LCE01C505***A	LCE02C505***A	LCE04C505***A
6		LCE00C605***A	LCE01C605***A	LCE02C605***A	LCE04C605***A
0	6	LCE00C006***A	LCE01C006***A	LCE02C006***A	LCE04C006***A
1		LCE00C106***A	LCE01C106***A	LCE02C106***A	LCE04C106***A
2		LCE00C206***A	LCE01C206***A	LCE02C206***A	LCE04C206***A
3		LCE00C306***A	LCE01C306***A	LCE02C306***A	LCE04C306***A
4		LCE00C406***A	LCE01C406***A	LCE02C406***A	LCE04C406***A
5		LCE00C506***A	LCE01C506***A	LCE02C506***A	LCE04C506***A
6		LCE00C606***A	LCE01C606***A	LCE02C606***A	LCE04C606***A
0	7	LCE00C007***A	LCE01C007***A	LCE02C007***A	LCE04C007***A
1		LCE00C107***A	LCE01C107***A	LCE02C107***A	LCE04C107***A
2		LCE00C207***A	LCE01C207***A	LCE02C207***A	LCE04C207***A
3		LCE00C307***A	LCE01C307***A	LCE02C307***A	LCE04C307***A
4		LCE00C407***A	LCE01C407***A	LCE02C407***A	LCE04C407***A
0	8	LCE00C008***A	LCE01C008***A	LCE02C008***A	LCE04C008***A
1		LCE00C108***A	LCE01C108***A	LCE02C108***A	LCE04C108***A
2		LCE00C208***A	LCE01C208***A	LCE02C208***A	LCE04C208***A
3		LCE00C308***A	LCE01C308***A	LCE02C308***A	LCE04C308***A
4		LCE00C408***A	LCE01C408***A	LCE02C408***A	LCE04C408***A
0	9	LCE00C009***A	LCE01C009***A	LCE02C009***A	LCE04C009***A
1		LCE00C109***A	LCE01C109***A	LCE02C109***A	LCE04C109***A
2		LCE00C209***A	LCE01C209***A	LCE02C209***A	LCE04C209***A
0	10	LCE00C010***A	LCE01C010***A	LCE02C010***A	LCE04C010***A
1		LCE00C110***A	LCE01C110***A	LCE02C110***A	LCE04C110***A
2		LCE00C210***A	LCE01C210***A	LCE02C210***A	LCE04C210***A
0	11	LCE00C011***A	LCE01C011***A	LCE02C011***A	LCE04C011***A
0	12	LCE00C012***A	LCE01C012***A	LCE02C012***A	LCE04C012***A

① Type 12 field convertible to Type 3/3R.

Lighting and Heating Control

Electrically Held Lighting Contactors, Class LC

Technical Data

General technical data:	
Finger-safe (main circuit / control circuit)	yes / yes
Degree of pollution	3
Altitude (m)	2,000
Ambient storage temperature (°C)	-30 to 65
Ambient operating temperature (°C)	-25 to 40
Humidity (% non-condensing)	no data
Shock resistance at rectangular impulse (g/ms)	no data
Shock resistance at sine pulse (g/ms)	no data
Rated impulse voltage resistance (kV)	no data
Rated insulation voltage (V)	600
Mechanical operating cycles as operating time:	
of contactor	100,000
of contactor with additional aux contacts	100,000
Main circuit:	
Number of main contacts	2 - 12 (maximum of 8 NC)
Typical power loss per conductor (W)	no data
Off-load operating frequency (cycles per hour)	60 for continued operation
Current ratings:	
Tungsten (poles per phase)	20A @277V 1p 1ph 20A @480V 2p 1ph 20A @480V 3p 3ph
Ballast (poles per phase)	30A @347V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
General and resistive (poles per phase)	30A @600V 1p 1ph 30A @600V 2p 1ph 30A @600V 3p 3ph
Coil ratings:	
Nominal voltage	(refer to coil voltage table)
Inrush / sealed power (VA)	248 / 28
Coil voltage tolerance factor	0.85 - 1.1
External/optional auxiliary contact:	
Number of NC / NO auxiliary contacts	2NC / 2NO max
Rating	A600, 24VDC, 24VAC
Installation/mounting/dimensions:	
Mounting orientation	vertical
Type of mounting: screw / DIN rail	yes / no
Height x Width x Depth (mm)	188 x 106 x 98
Minimum clearance to sides (mm)	12.7
Minimum clearance to earthed parts (mm)	12.7
Connection type / torque:	
Main contact terminals	screw / 35 lb in
Coil terminals	screw / 15 lb in
Auxiliary contact terminals	screw / 7-12 lb in
Control module terminals	screw / 5 lb in
Solid and stranded conductors (AWG):	
Main contact terminals	1x(14-8), #8 solid or stranded 2x(14-8), #8 stranded only
Coil terminals	2x(18-14)
Auxiliary contact terminals	2x(22-12)
Control module terminals	1x(22-12)
Conductor type for main / control circuits	75°C CU / 60-75°C CU
Short circuit current rating of main circuit:	
Short circuit current rating	(see SCCR tables)
Certificates:	
cUL	

Coil voltages:

24V 60Hz / 20V 50Hz
115-120V 60Hz / 110V 50Hz
200-208V 60Hz
230-240V 60Hz / 220V 50Hz
277V 60Hz / 240V 50Hz
347V 60Hz
460-480V 60Hz / 440V 50Hz
575-600V 60Hz / 550V 50Hz

Short circuit current ratings with fuses:

Max. Volt.	Fuse	Max. Device Rating (Amps)	SCCR (kA)
600	RK fuse	60	5

Short circuit current ratings with circuit breakers:

Max. Volt.	Siemens Listed Circuit Breaker	Max. Device Rating (Amps)	SCCR (kA)
600	NGG3B040L	40	5
480	HEG3B040L	40	5
480	ED63B040L	40	5
480	NGG3B040L	40	5

Conversion module:

Input Volt. (AC)	Steady State Current @ Rated Volts (mA)	Max. VA
24	80	5
115-120	83	12
200-277	91	30

Conversion module:

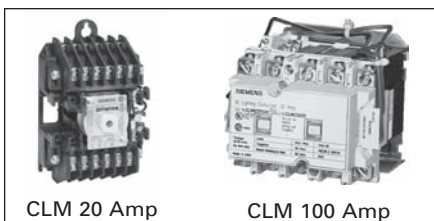
Min. pulse duration (3-wire module)	250ms
Max. allowable leakage current	1.8 mA
EMI	35 V/m
Surge transient peak	6 kV
Frequency range	40-70 Hz

Lighting and Heating Contactors

Mechanically and Magnetically Held Lighting Contactors, Class CLM

• Revised •
07/20/15

Selection



Mechanically Latched Lighting and Heating Contactor

The CLM Lighting Contactors can be used with metal halide, mercury vapor, quartz halogen, tungsten and fluorescent lighting. They provide reliable and convenient lighting control in numerous applications, such as industrial plants, schools, hospitals, office buildings, shopping centers, airports, stadiums . . . literally everywhere lighting is required.

The CLMs are listed under UL 508 with no derating when used open or enclosed. Combination lighting contactors are listed for UL service entrance.

UL listed File #E60310

CSA Certified File LR 6535

Type CLM 20 Amp Lighting Contactor Solid State Control Modules

The CLM 20 amp lighting contactor is an electromagnetically operated, mechanically latched three wire control contactor. The most commonly used method of control is a three position momentary contact switch with a center-off position. The controlling device must be able to make the coil inrush current but need not break it. The coil current is interrupted by the control contacts within the CLM contactor. Power for the control line may come from a separate source or directly from the line side of the CLM contactor. The CLM contactor can also be controlled by devices such as:

- Break-glass control stations
- Timers having single pole, double throw contacts
- Photo-electric cells^①
- Energy management systems^①
- Microprocessors^①
- Occupancy sensors^①

Control modules make it possible to use a controlling device that does not have enough current-carrying capacity to control the CLM contactor directly. Control modules are also used when

the control station is to be located at a distance greater than the allowable contactor line run.

Another use for control modules occurs when the controlling device is only available as a single pole single-throw contact necessitating a two wire control line.

Still another application for control modules is when start-stop three wire control is needed.

Control modules also can make it possible to operate the CLM coil from its own incoming line at one voltage while providing the control at a second, perhaps lower voltage.

Two Wire Control Module (Accessory 47)

The advantages of two wire controls are:

1. Control station can have lower ampacity rating.
2. Control station can be located an extended distance from the CLM contactor.
3. Control module can frequently be controlled directly from microprocessor.
4. Control devices can be two wire single pole, single-throw types.
5. Control voltage may be different than the CLM coil circuit and at a lower voltage level.

Note: If the control power to the solid state control module is lost while the module is energized the lighting contactor will open. If the line power to the lighting contactor is lost while the contactor is energized the contactor will not change state with return of line voltage. Power will be restored to the load if the control module is still energized. Control station should be the maintained type.

Three Wire Control Module (Accessory 48)

1. The accessory 48 consists of two relays with contacts appropriately interconnected which provides for an interlocking that prevents both relays from being energized simultaneously.
2. This module has similar characteristics to the two wire module (Accessory 47) except there is no change of switch contact position upon loss of control line power. Control stations should be the momentary type.

Stop-Start Control Module (Accessory 49)

Stop-start three wire maintained control is an arrangement used mostly when controlling motors, but can be used in lighting applications.

Any number of momentary contact control stations consisting of normally open start buttons and normally closed stop buttons can be used. Start buttons are connected in parallel and stop buttons in series.

Operation (Magnetic Latch)

A permanent magnet is built into the contactor structure of the 30A, 60A, 100A, and 200A contactors that will maintain the contactor in its energized state indefinitely without using control power. When energized, a DC current is applied that produces a magnetic field that reinforces the polarity of the permanent magnet, and the contactor pulls in immediately. The current to the coil is disconnected by the coil clearing interlock. In order to drop out the contactor, it is necessary to apply a field through the OFF coil in the reverse direction to the permanent magnet. This momentarily cancels the magnetic attraction and the contactor drops out. Coil and module failures are possible when used with solid state relays and PLC outputs. 24-volt systems are ok to use, but 120 volts and above should be discouraged. If higher values cannot be avoided, an interposing relay should be used.

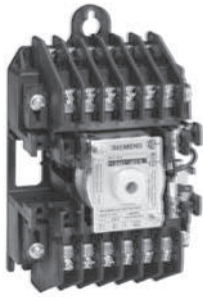
(Mechanically Latched)

The 300 & 400A lighting and heating contactors operate using a latching mechanism.

Closing – When the “close” pushbutton is operated, the closing coil is energized, closing the contactor. As the contactor closes, the latch lever hooks over the latch pin to mechanically latch the contactor closed. The coil-clearing auxiliary contact de-energizes the closing coil.

Opening – When the “Trip” pushbutton is operated, the trip solenoid coil is energized, unhooking the latch lever from the latch pin, which allows the contactor to open. As the contactor opens, the coil-clearing auxiliary contact de-energizes the trip solenoid coil.

^① Operation through control modules.



Ordering Information

- Replace *** with a number from the coil table.
- Field modification kits see page 9/104.
- Factory modifications see page 9/119.
- Dimensions see page 9/153 open page 9/170 enclosed.
- Wiring Diagrams see page 9/191.
- Replacement parts see page 9/134.

Coil Table

60Hz Voltage	Number
24 ^②	024
120	120
208	208
240	240
277	277
480	480
600 ^③	600

Open and Non-combination Enclosed Contactors

Max Amp Rating	Number of Poles	Open Type ^④		Enclosure					
		Catalog Number	List Price \$	NEMA 1 General Purpose		NEMA 12 NEMA 3/3R ^⑤ Industrial Use Weatherproof		NEMA 4/4X Stainless Steel ^⑥ Watertight, Dust-tight, Corrosion Resistant, 304 Stainless Steel	
				Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
20	2	see table below		CLM1B02***		CLM2B02***		CLMSB02***	
	3			CLM1B03***		CLM2B03***		CLMSB03***	
	4			CLM1B04***		CLM2B04***		CLMSB04***	
	6			CLM1B06***		CLM2B06***		CLMSB06***	
	8			CLM1B08***		CLM2B08***		CLMSB08***	
	10			CLM1B10***		CLM2B10***		CLMSB10***	
30	12			CLM1B12***		CLM2B12***		CLMSB12***	
	2			CLM1C02***		CLM2C02***		CLMSC02***	
	3			CLM1C03***		CLM2C03***		CLMSC03***	
	4			CLM1C04***		CLM2C04***		CLMSC04***	
	5			CLM1C05***		CLM2C05***		CLMSC05***	
	6			CLM1C06***		CLM2C06***		—	—
60	8			CLM1C08***		CLM2C08***		—	—
	9			CLM1C09***		CLM2C09***		—	—
	10			CLM1C10***		CLM2C10***		—	—
	12			CLM1C12***		CLM2C12***		—	—
	2			CLM1D02***		CLM2D02***		CLMSD02***	
	3			CLM1D03***		CLM2D03***		CLMSD03***	
100	4			CLM1D04***		CLM2D04***		CLMSD04***	
	5			CLM1D05***		CLM2D05***		CLMSD05***	
	6			CLM1D06***		CLM2D06***		—	—
	8			CLM1D08***		CLM2D08***		—	—
200	9			CLM1D09***		CLM2D09***		—	—
	10			CLM1D10***		CLM2D10***		—	—
	12			CLM1D12***		CLM2D12***		—	—
300	2			CLM1E02***		CLM2E02***		CLMSE02***	
	3			CLM1E03***		CLM2E03***		CLMSE03***	
	4			CLM1E04***		CLM2E04***		CLMSE04***	
	5			CLM1E05***		CLM2E05***		CLMSE05***	
400	2			CLM1F02***		CLM2F02***		CLMSF02***	
	3			CLM1F03***		CLM2F03***		CLMSF03***	
	4			CLM1F04***		CLM2F04***		CLMSF04***	
	5			CLM1F05***		CLM2F05***		CLMSF05***	
300	2			CLM1G02***		CLM2G02***		—	—
	3			CLM1G03***		CLM2G03***		—	
400	2			CLM1H02***		CLM2H02***		—	—
	3			CLM1H03***		CLM2H03***		—	

Open 20 Amp Contactors

Max Amp Rating	Number of Poles ^①	110–120V Coil 50/60Hz		208–240V Coil 50/60Hz		265–277V Coil 50/60Hz	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
20	2	CLM22031		CLM22061		CLM22071	
	3	CLM32031		CLM32061		CLM32071	
	4	CLM42031		CLM42061		CLM42071	
	6	CLM62031		CLM62061		CLM62071	
	8	CLM82031		CLM82061		CLM82071	
	10	CLM102031		CLM102061		CLM102071	
	12	CLM122031		CLM122061		CLM122071	

① Contactors with 2–6-poles will be assembled with all poles located in the top portion of the contactor. Contactors with 8–12-poles will be assembled with 6-poles in the top portion and the remaining poles in the bottom portion of the contactor.

② 24 volt coils are not available on 20, 300 and 400 amp contactor sizes. For 24 volt control of 20 amp contactor select solid state control module.

③ For conduit hubs and conversion instructions, see page 9/110.

④ CLM 30 & 60A 6–12-pole can be field assembled. Order mounting kit **49MCPMA** and the appropriate number of 2–5 pole contactors.


⑤ 24, 480 or 600 volt coils are not available on 20 amp contactors.

Lighting Control

Combination Mechanically and Magnetically Held Lighting Contactors, Class CM

Revised
07/20/15

Selection

	Ordering Information	Coil Table	
		60Hz Voltage	Number
	► Replace *** with a number from the coil table.	24 ^①	024
	► Field modification kits see page 9/104.	120	120
	► Factory modifications see page 9/119.	208	208
	► Dimensions see page 9/170.	240	240
	► Wiring Diagrams see page 9/191.	277	277
	► Replacement parts see page 9/134.	480	480
		600 ^③	600

Combination Lighting Contactors

Disconnect Type	Contactor Amp Rating	Number of NO Poles	Disc Amp Rating	Disc Amp/ Fuse Clip Rating	Circuit Breaker Rating	Enclosure					
						NEMA 1 General Purpose		NEMA 12, NEMA 3/3R ^② NEMA 4 Painted (thru 100 amps) Industrial Use Weatherproof, Watertight, Dust-tight			NEMA 4/4X Stainless Steel Watertight, Dust-tight, Corrosion Resistant, 304 Stainless Steel
						Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
Non-Fusible	20	3	30A	—	—	CMNB14***		CMNB24***		CMNBS4***	
	30	3	30A	—	—	CMNC14***		CMNC24***		CMNCS4***	
	60	3	60A	—	—	CMND15***		CMND25***		CMNDS5***	
	100	3	100A	—	—	CMNE16***		CMNE26***		CMNES6***	
	200	3	200A	—	—	CMNF17***		CMNF27***		CMNFS7***	
	300	3	400A	—	—	CMNG18***		CMNG28***		CMNGS8***	
Fusible	20	3	—	30A/250V	—	CMFB10***		CMFB20***		CMFBS0***	
		3	—	30A/600V	—	CMFB11***		CMFB21***		CMFBS1***	
	30	3	—	30A/250V	—	CMFC10***		CMFC20***		CMFCS0***	
		3	—	30A/600V	—	CMFC11***		CMFC21***		CMFCS1***	
	60	3	—	60A/250V	—	CMFD12***		CMFD22***		CMFDS2***	
		3	—	60A/600V	—	CMFD13***		CMFD23***		CMFDS3***	
	100	3	—	100A/250V	—	CMFE14***		CMFE24***		CMFES4***	
		3	—	100A/600V	—	CMFE15***		CMFE25***		CMFES5***	
	200	3	—	200A/250V	—	CMFF16***		CMFF26***		CMFFS6***	
		3	—	200A/600V	—	CMFF17***		CMFF27***		CMFFS7***	
	300	3	—	400A/250V	—	CMFG18***		CMFG28***		CMFGS8***	
		3	—	400A/600V	—	CMFG19***		CMFG29***		CMFGS9***	
Circuit Breaker	20	3	—	—	20A	CMBB14***		CMBB24***		CMBBS4***	
	30	3	—	—	30A	CMBC15***		CMBC25***		CMBCS5***	
	60	3	—	—	60A	CMBD18***		CMBD28***		CMBDS8***	
	100	3	—	—	100A	CMBE18***		CMBE28***		CMBES8***	
	200	3	—	—	200A	CMBF10***		CMBF20***		CMBFS0***	
	300	3	—	—	300A	CMBG11***		CMBG21***		CMBGS1***	

Lighting & Heating Contactor Ratings CLM

Maximum AC/DC Voltage and Amp Ratings

Load Type	Amperes Continuous	Poles to Load	
		1 for 1-Phase	2 for 1-Phase 3 for 3-Phase
Tungsten	20	250V AC	250V AC
Ballast	20	347V AC	600V AC
General	30	347V AC	600V AC
General	20	125V DC	250V DC

Inrush Current Over Fuse Size (amps RMS) at AC Control Voltage 20A CLM					
Amps	120V	240V	277V	347V	480V
Inrush	5.0	2.5	2.2	1.8	1.3
Fuse	2.0	1.0	1.0	0.75	0.5

Contactor Ratings			
Load Type	Amperes Continuous	Max Volts Line to Line	Max Volts Line to Neutral
Tungsten	30-400	480	277
Ballast	30-400	600	346
Heating	30-400	600	346

AC Coil Data			
Contactor Amperes	No. Poles	Inrush VA	Dropout VA
20	2-12	625	6
30	2-5	410	40
60	2-3	410	40
60	4-5	600	40
100/200	2-3	900	200
100/200	4-5	1300	130
300/400	2-3	1600	550

① 24 volt coils are not available on 20 and 300 amp contactors. Use solid state control module on 20 amp size.

② For conduit hubs and conversion instructions, see page 9/110.

③ 600 volt coils are not available on 20 amp contactors.

Features

- Enclosed coils (50-5000VA); Completely encloses the transformer coils against moisture, dust, dirt and industrial contaminants for maximum protection in hostile and industrial environments.
- Fuse clips (most models). Factory mounted for integral fusing on the secondary side to save panel space, save wiring time and save the cost of buying an add-on fuse block or kit
- Integrally finger safe terminals. Between terminals and transformer, protect against electrical creepage. Up to 30% greater terminal contact area permits low-loss connections. Extra-deep barriers reduce the chance of shorts from frayed leads or careless wiring
- Terminals. Molded into the transformer, are difficult to break during wiring. A full quarter-inch of thread on the 8-32 terminal screws prevents stripping and pullout
- Jumpers supplied. Two jumper links are standard with all transformers which can be wired for dual primary voltages

Operation

Industrial control circuits and motor control loads typically require more current when they are initially energized than under normal operating conditions. This period of high current demand, referred to as inrush, may be as great as ten times the current required under steady state (normal) operating conditions, and can last up to 40 milliseconds. A transformer in a circuit subject to inrush will typically attempt to provide the load with the required current during the inrush period. However, it will be at the expense of the secondary voltage stability by allowing the voltage to the load to decrease as the current increases. This period of secondary voltage instability, resulting from increased current, can be of such magnitude that the transformer is unable to supply sufficient voltage to energize the load. The transformer must therefore be designed and constructed to accommodate the high inrush current, while maintaining secondary voltage stability. According to NEMA standards, the secondary voltage would typically be at 85% of the rated voltage.



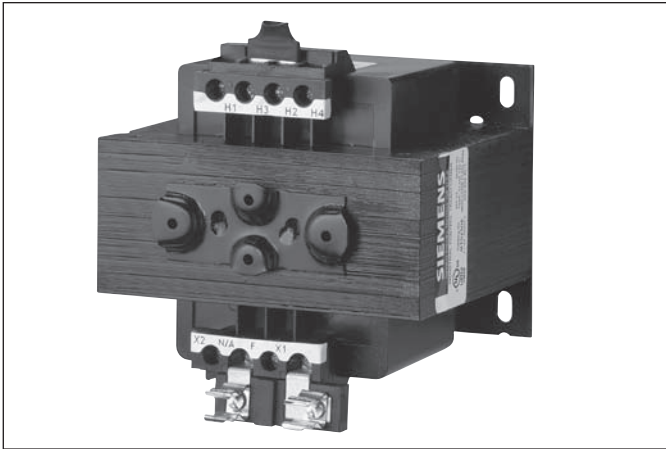
Industrial Control Power Transformers are specifically designed and built to provide adequate voltage to the load while accommodating the high current levels present at inrush. These transformers deliver excellent secondary voltage regulation and meet or exceed the standards established by NEMA, ANSI, UL and cUL. Their rugged construction and excellent electrical characteristics ensure reliable operation of electromagnetic devices and trouble-free performance.

Specifications

- Laminations are built with silicon steel to minimize core losses and to increase optimum performance and efficiency
- Copper magnet wire of the highest quality assures efficient operation
- Factory mounted type "K" fuse clips are standard on all secondary transformers where possible
- Two jumper links are standard with all transformers which can be wired for dual primary voltages
- cUL Listed and CSA certified

- 50/60 Hz rated
- Insulation materials are of the highest rating available for the temperature class
- Mounting plate is heavy gauge steel to add strength to core construction and provide stable mounting. Slotted mounting feet permit easy installation
- Attractive black finish; easy-to-read nameplate with complete rating data and wiring diagram
- Class 130°C (226°F) insulation system. 80°C (176°F) temperature rise. (50-750VA typical)
- Class 180°C (356°F) insulation system. 120°C (248°F) temperature rise. (1000-5000VA typical)
- Optional field mounted 2-pole primary Class CC fuse block is available

General



Features

- Class MTG Industrial Control Transformers are 100% certified for all domestic and International Applications
- The MTG line has full compliance with IEC Safety standards EN 61 558
- CE Mark in accordance with requirements for EN 61 558
- Meets IP-20 specifications per IEC 529 for finger-safe protection when used with Siemens Touch Safe snap on terminal cover kits. Meets IP-00 specifications when covers are not used.
- UL Listed
- Exceeds applicable requirements for control transformers as determined by NEMA and ANSI
- Insulation requirements is twice that of UL5085
- Available in 50 to 750 VA sizes, in all standard voltage combinations
- Class 130°C (226°F) insulation system. 80°C (176°F) temperature rise. (50-750VA typical)
- Class 180°C (356°F) insulation system. 120°C (248°F) temperature rise. (1000–5000VA typical)
- Primary and secondary fusing capability available as field installed kits for domestic or international fusing
- Integrally-molded terminals and barriers between terminals make breakage virtually impossible during wiring. The MTG transformer construction is the same as our high quality Class MT transformer

Optional Field Installed Fuse Clip Kits For Panel Mounting

- 2-Pole primary Class CC fuse block
- 1-Pole secondary midjet fuse block for $1\frac{3}{32} \times 1\frac{1}{2}$ fuses
- 2-Pole primary international type fuse blocks
- 1-Pole secondary international type fuse blocks

Optional Touch-Safe Snap-On Terminal Cover Kits

The Touch-Safe terminal covers are designed to comply with IEC 742 and IP 20 requirements. When installed, the covers prevent contact with current carrying parts on the transformer and are available for 4 terminal configurations.

The international fuse block kits have inherent touch safe terminals and fuse clips.

Siemens Meets International Standards

CSA (Canadian Standards Association) was utilized as a Competent Body in reviewing, interpreting and properly complying with the requirements of IEC-742 to place a CE mark on its MTG Series product. As a National Certification Body, CSA also has the proper documentation and reports on file for MTG Series to utilize the CB Scheme ensuring acceptance throughout the world.

The standard Siemens MTG product is available with terminal covers which meets the requirements of IEC-529, IP20 degree of protection and meets the applicable requirements for covers per IEC-742.

IEC-742

The requirements for industrial control circuit transformers to be used in the European Common Market are identified by the International Electrotechnical Commission (IEC) and specified under IEC-742, Non-Short Circuit Proof Isolating Transformers, under the Low Voltage Directive 73/23/EEC. Manufacturers of control transformers indicate compliance with these requirements by placing a CE mark on the product.

- Winding to winding insulation requirements may be twice that for IEC-742 compared to UL506
- The electrical clearances between current carrying parts are one-third greater to comply with IEC-742 requirements for units up to 250VA with voltages up to 440 volts ac
- Transformers manufactured to IEC-742 requirements will have a minimum of 10% higher overload capacity than those manufactured only to UL506 requirements

While no requirement exists in IEC-742 for the electrical connections to be either finger safe or touch proof, the specification does state that IF a transformer is supplied with a cover to prevent incidental contact with current carrying parts, that cover must utilize two separate methods or places of securing it to the component, with neither being dependent upon the other. Additionally, one of these methods MUST require a tool to remove it.

IEC-529

The requirements for finger-safe or touch-proof electrical connections are identified by the International Electrotechnical Commission (IEC) under specification 529, Classification of Degrees of Protection Provided by Enclosures. These various degrees of protection are identified and differentiated by IP ratings.

The IP specification which most closely approximates protection to a human finger is IP20. This IP rating would be the most common degree of touch-proof connection for electrical components such as transformers.

EN 61 558

The requirements for industrial control transformers to be used in the European Common Market are identified by the IEC and specified in EN 61 558, Safety of Power Control Transformers, under Low Voltage Directive 73/23/EEC. CE mark on the product indicates compliance.

Transformer Selection Process

Selecting a transformer for industrial control circuit applications requires knowledge of the following terms:

Inrush VA is the product of load voltage (V) multiplied by the current (A) that is required during circuit start-up. It is calculated by adding the inrush VA requirements of all devices (contactors, timers, relays, pilot lights, solenoids, etc.), which will be energized together. Inrush VA requirements are best obtained from the component manufacturer.

Sealed VA is the product of load voltage (V) multiplied by the current (A) that is required to operate the circuit after initial start-up or under normal operating conditions. It is calculated by adding the sealed VA requirements of all electrical components of the circuit that will be energized at any given time. Sealed VA requirements are best obtained from the component manufacturer. Sealed VA is also referred to as steady state VA.

Primary Voltage is the voltage available from the electrical distribution system and its operational frequency, which is connected to the transformer supply voltage terminals.

Secondary Voltage is the voltage required for load operation which is connected to the transformer load voltage terminals.



Fuse Clip Kit KCCFPX2R

Primary Fuse Kit

In addition to factory installed secondary fusing, Siemens offers a primary fuse kit for class MT transformers size 50–750 VA for field installation. The primary fuse kit includes a 2-pole Class CC fuse block, instructions and all associated mounting and wiring hardware. Additionally, this fuse kit will fit most competitors' units. To order this kit, use catalog number **KCCFPX2R**. The primary fuse kit, when installed, will add a maximum of 0.69 in. (18 mm) to the transformer "A" dimension and 1.94 in. (49 mm) to the "C" dimension.

Once the circuit variables have been determined, transformer selection is a simple 5-step process as follows:

1. Determine the Application Inrush VA by using the following industry accepted formula:
Application Inrush VA = $\sqrt{(\text{Inrush VA})^2 + (\text{Sealed VA})^2}$
2. Refer to the Regulation Data Chart. If the primary voltage is basically stable and does not vary by more than 5% from nominal, the 90% secondary voltage column should be used. If the primary voltage varies between 5% and 10% of nominal, the 95% secondary voltage column should be used.
3. After determining the proper secondary voltage column, read down until a value equal to or greater than the Application Inrush VA is found. In no case should a figure less than the Application Inrush VA be used.
4. Read left to the Transformer VA Rating column to determine the proper transformer for this application. As a final check, make sure that the Transformer VA Rating is equal to or greater than the total sealed requirements. If not, select a transformer with a VA rating equal to or greater than the total sealed VA.
5. Refer to the following pages to determine the proper catalog number based on the transformer VA, and primary and secondary voltage requirements.

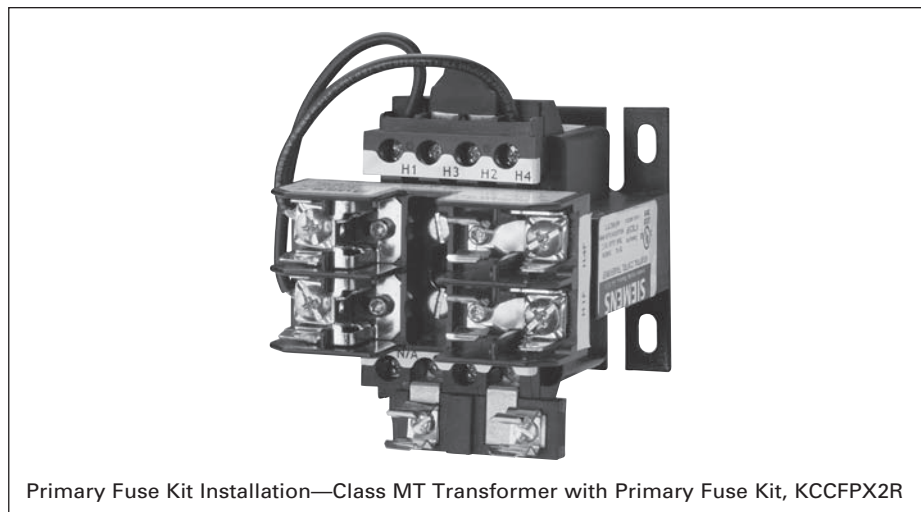
Regulation Data Chart

Transformer VA Ratings	Inrush VA At 20% Power Factor		
	NEMA/IEC 95% Sec Voltage	NEMA/IEC 90% Sec Voltage	NEMA/IEC 85% Sec Voltage
25	100/—	130/—	150/—
50	170/190	200/220	240/270
75	310/350	410/460	540/600
100	370/410	540/600	730/810
150	780/860	930/1030	1150/1270
200	810/900	1150/1270	1450/1600
250	1400/1540	1900/2090	2300/2530
300	1900/2090	2700/2970	3850/4240
350	3100/3410	3650/4020	4800/5280
500	4000/4400	5300/5830	7000/7700
750	8300/9130	11000/12100	14000/15400
1000 ^①	15000/—	21000/—	27000/—
1000 ^②	9000/—	13000/—	18500/—
1500	10500/—	15000/—	20500/—
2000	17000/—	25500/—	34000/—
3000	24000/—	36000/—	47500/—
5000	55000/—	92500/—	115000/—

To comply with NEMA standards, which require all magnetic devices to operate successfully at 85% of rated voltage, the 90% secondary voltage column is most often used in selecting a transformer.

① For units with Class 105°C insulation systems.

② For units with Class 180°C insulation systems.



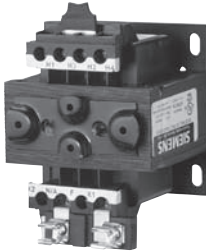
Primary Fuse Kit Installation—Class MT Transformer with Primary Fuse Kit, KCCFPX2R

Industrial Control Power Transformers

Domestic, Class MT

• Revised •
03/28/16

Selection



Ordering Information

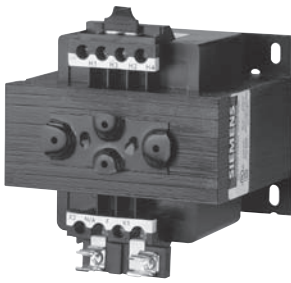
- ▶ Use the Voltage Table to determine the primary and secondary voltage required.
- ▶ Field Modifications see page 9/112.
- ▶ Dimensions see page 9/155.
- ▶ Wiring Diagrams see page 9/193.
- ▶ Touchsafe cover chart see page 9/101.

Voltage Table

Primary Volts 50/60 Hz	Secondary Volts	Letter
240 X 480, 230 X 460, 220 X 440	120/115/110	A
240 X 480	24	B
120 X 240	24	C
115 X 230	24	D
550/575/600	110/115/120	E
208/277	120	F
208/230/460	115	G
230/460/575	95/115	H
380/400/415	110 X 220	I
208/230/460, 200/220/440, 240/480	24 X 115, 23 X 110, 25 X 120	J
240/416/480/600, 230/400/460/575, 220/380/440/550, 208/500	99/120/130, 95/115/125, 91/110/120, 85/100/110	L
240 X 480	120 X 240	M

VA Rating	Voltage Letter A		Voltage Letter B		Voltage Letter C		Voltage Letter D		Voltage Letter E		Voltage Letter F	
	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
50	MT0050A		MT0050B		MT0050C		MT0050D		MT0050E		MT0050F	
75	MT0075A		MT0075B		MT0075C		MT0075D		MT0075E		MT0075F	
100	MT0100A		MT0100B		MT0100C		MT0100D		MT0100E		MT0100F	
150	MT0150A		MT0150B		MT0150C		MT0150D		MT0150E		MT0150F	
200	MT0200A		MT0200B		MT0200C		MT0200D		MT0200E		MT0200F	
250	MT0250A		MT0250B		MT0250C		MT0250D		MT0250E		MT0250F	
300	MT0300A		MT0300B		MT0300C		MT0300D		MT0300E		MT0300F	
350	MT0350A		MT0350B		MT0350C		MT0350D		MT0350E		MT0350F	
500	MT0500A		MT0500B		MT0500C		MT0500D		MT0500E		MT0500F	
750	MT0750A		MT0750B		—	—	—	—	MT0750E		MT0750F	
1000	MT1000A		—	—	—	—	—	—	MT1000E		—	—
1500	MT1500A		—	—	—	—	—	—	—	—	—	—
2000	MT2000A		—	—	—	—	—	—	—	—	—	—
3000	MT3000A		—	—	—	—	—	—	—	—	—	—
5000	MT5000A		—	—	—	—	—	—	—	—	—	—

VA Rating	Voltage Letter G		Voltage Letter H		Voltage Letter I		Voltage Letter J		Voltage Letter L		Voltage Letter M	
	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$	Catalog No	List Price \$
50	MT0050G		MT0050H		MT0050I		MT0050J		MT0050L		MT0050M	
75	MT0075G		MT0075H		MT0075I		MT0075J		—	—	MT0075M	
100	MT0100G		MT0100H		MT0100I		MT0100J		MT0100L		MT0100M	
150	MT0150G		MT0150H		MT0150I		MT0150J		MT0150L		MT0150M	
200	MT0200G		MT0200H		MT0200I		MT0200J		—	—	MT0200M	
250	MT0250G		MT0250H		MT0250I		MT0250J		MT0250L		MT0250M	
300	MT0300G		MT0300H		MT0300I		MT0300J		—	—	MT0300M	
350	MT0350G		MT0350H	—	MT0350I		MT0350J		MT0350L		MT0350M	
500	MT0500G		MT0500H		MT0500I		MT0500J		MT0500L		MT0500M	
750	MT0750G		MT0750H		MT0750I		—	—	MT0750L		MT0750M	
1000	MT1000G		MT1000H		MT1000I		—	—	—	—	MT1000M	
1500	MT1500G		MT1500H		MT1500I		—	—	—	—	—	—
2000	MT2000G		MT2000H		MT2000I		—	—	—	—	—	—
3000	MT3000G		MT3000H		MT3000I		—	—	—	—	—	—
5000	MT5000G		MT5000H		—	—	—	—	—	—	—	—



Ordering Information

- ▶ Use the Voltage Table to determine the primary and secondary voltage required.
- ▶ Field Modifications see page 9/112.
- ▶ Dimensions see page 9/155.
- ▶ Wiring Diagrams see page 9/193.
- ▶ Touchsafe cover chart see below.

Voltage Table

Primary Volts 50/60 Hz	Secondary Volts	Letter
240 X 480, 230 X 460, 220 X 440	120/115/110	A
240 X 480	24	B
120 X 240	24	C
550/575/600	110/115/120	E
380/400/415	110 X 220	I
208/230/460, 200/220/440, 240/480	24 X 115, 23 X 110, 25 X 120	J
380	24	P

VA Rating	Voltage Letter A		Voltage Letter B		Voltage Letter C		Voltage Letter E		Voltage Letter I		Voltage Letter J		Voltage Letter P	
	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$	Catalog No	ListPrice\$
50	MTG0050A		MTG0050B		MTG0050C		MTG0050E		MTG0050I		MTG0050J		MTG0050P	
75	MTG0075A		MTG0075B		MTG0075C		MTG0075E		MTG0075I		MTG0075J		MTG0075P	
100	MTG0100A		MTG0100B		MTG0100C		MTG0100E		MTG0100I		MTG0100J		MTG0100P	
150	MTG0150A		MTG0150B		MTG0150C		MTG0150E		MTG0150I		MTG0150J		MTG0150P	
200	MTG0200A		MTG0200B		MTG0200C		MTG0200E		MTG0200I		MTG0200J		MTG0200P	
250	MTG0250A		MTG0250B		MTG0250C		MTG0250E		MTG0250I		MTG0250J		MTG0250P	
300	MTG0300A		MTG0300B		MTG0300C		MTG0300E		MTG0300I		MTG0300J		MTG0300P	
350	MTG0350A		MTG0350B		MTG0350C		MTG0350E		MTG0350I		MTG0350J		MTG0350P	
500	MTG0500A		MTG0500B		MTG0500C		MTG0500E		MTG0500I		MTG0500J		MTG0500P	
750	MTG0750A		MTG0750B		MTG0750C		MTG0750E		MTG0750I		MTG0750J		MTG0750P	
1000	MTG1000A		MTG1000B		MTG1000C		—	—	—	—	MTG1000J		—	—
1500	MTG1500A		—	—	—	—	—	—	—	—	—	—	—	—
2000	MTG2000A		—	—	—	—	—	—	—	—	—	—	—	—
3000	MTG3000A		—	—	—	—	—	—	—	—	—	—	—	—
5000	MTG5000A		—	—	—	—	—	—	—	—	—	—	—	—

Touchsafe Covers For MT style CPT

VA Rating	Voltage Letter	Primary Side Touchsafe?	Secondary Side Touchsafe?	Secondary Side Fuse Clips?
50	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,L,M	Yes	Yes	No ^②
75	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,M	Yes	Yes	No ^②
100	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,L,M	Yes	Yes	No ^②
150	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,L,M	Yes	Yes	No ^②
200	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,M	Yes	Yes	No ^②
250	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,L,M	Yes	Yes	No ^②
300	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,M	Yes	Yes	No ^②
350	A,B,C,D,E,F,G,H,J	Yes	Yes	Yes ^①
	I,L,M	Yes	Yes	No ^②
500	A,B,C,D,E,F,G,H,J	Yes	No ^③	Yes ^①
	I,L,M	Yes	Yes	No ^②
750	A,B,C,D,E,F,G,H	Yes	No ^③	Yes ^①
	I,L,M	Yes	Yes	No ^②
1000	A,E,G,H	Yes	No ^③	Yes ^①
	I,M	Yes	Yes	No ^②
1500	A,G,H	Yes	No ^③	Yes ^①
	I	Yes	Yes	No ^②
2000	A,G,H	Yes	No ^③	Yes ^①
	I	Yes	Yes	No ^②
3000	A,G,H,I	Yes	Yes	No ^②
5000	A,G,H	Yes	Yes	No ^②

① Needs US2:KCCSECFVR to be Touchsafe

② If secondary fuse holder is required, use KCCF1G panel mount fuse holder

③ Needs US2:KCCSECFVR2

④ International fusing options, see CPT accessory page

Touchsafe Covers For MTG style CPT

VA Rating	Voltage Letter	Primary Side Touchsafe?	Secondary Side Touchsafe?	Secondary Side Fuse Clips? ^④
50	A,B,C,E,I,J,P	Yes	Yes	No
75	A,B,C,E,I,J,P	Yes	Yes	No
100	A,B,C,E,I,J,P	Yes	Yes	No
150	A,B,C,E,I,J,P	Yes	Yes	No
200	A,B,C,E,I,J,P	Yes	Yes	No
250	A,B,C,E,I,J,P	Yes	Yes	No
300	A,B,C,E,I,J,P	Yes	Yes	No
350	A,B,C,E,I,J,P	Yes	Yes	No
500	A,B,C,E,I,J,P	Yes	Yes	No
750	A,B,C,E,I,J,P	Yes	Yes	No
1000	A,B,C,J	Yes	Yes	No
1500	A	Yes	Yes	No
2000	A	Yes	Yes	No
3000	A	Yes	Yes	No
5000	A	Yes	Yes	No

Field Modification Kits

Class SMF, MMS, MRS

Selection

Accessories—Class SMF

Description	Catalog Number	List Price \$
Handle Guard Kit with Padlock Provision	SMFFL1	
Emergency Off Actuator	SMFPB1	
Additional Key for Key Operated Devices	SMFFK1	

Pilot Light Kits—Class MMS, MRS^①

Device	Voltage Rating	Red Pilot Light		Green Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Class SMF	115–277V AC	SMFPL10		SMFPL10G	

Enclosures—Class SMF

Enclosure Type	For Use With SMF	Catalog Number	List Price \$
Standard Size NEMA 1 General Purpose	F01, F01P, F02, F02P, F03, F03P, F04, F04P	SMFFE2	
Oversized NEMA Type 1 General Purpose	F01, F01P, F02, F02P, F03, F03P, F04, F04P	SMFFE1	
NEMA 3R, 4, 12 Watertight Dust-tight	F01, F01P, F02, F02P, F03, F03P, F04, F04P	SMF40BC2	

Nameplates—Class SMF

For Use On	Nameplate Marking	Without Pilot Light		With Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Standard commercial switch box cover including stainless steel plates	None	SMFFN2		—	—
Stainless Steel Plate	None	SMFFSN3		SMFFSN4	
NEMA 1 surface mounted enclosure or gray flush plate	None	SMFFN30		SMFFN40	
	High	SMFFN31		SMFFN41	
	Low	SMFFN32		SMFFN42	

Replacement Parts—Class SMF, MMS

Description	Catalog Number	List Price \$
Replacement Toggle Kits: Type FW and KW (NEMA 4 Metallic Enclosure)	SMFHW1	

Accessories—Class MMS, MRS

Description	Catalog Number	List Price \$
Handle Guard Kit with Padlock Provision	SMFFL1	
Emergency Off Actuator	SMFPB1	
Additional Key for Key Operated Devices	SMFFK1	

Pilot Light Kits—Class MMS, MRS^①

Device	Voltage Rating	Red Pilot Light		Green Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Class MMS	110–120V AC	SMFPL11		SMFPL11G	
	208–277V AC	SMFPL12		SMFPL12G	
	440–600V AC	SMFPL13		SMFPL13G	

Enclosures—Class MMS

Enclosure Type	For Use With MMS	Catalog Number	List Price \$
Standard Size NEMA 1 General Purpose	K01, K01P, K01B, K02, K02A, K02B, K03, K03A, K03B, K04, K04A, K04B	MMSKE3	
Oversized NEMA Type 1 General Purpose	K01, K02B, K02C, K03, K03A, K03B, K04, K04B, K04C, K02	SMFKE1	
Jumbo NEMA Type 1 General Purpose	K01, K02B, K02C, K03, K03A, K03B, K04, K04B, K04C, K02	SMFKE2	
NEMA 3R, 4, 12 Watertight Dust-tight	K01, K02B, K02C, K03, K03A, K03B, K04, K04B, K04C	SMF40BC2	

Nameplates—Class MMS

For Use On	Nameplate Marking	Without Pilot Light		With Pilot Light	
		Catalog Number	List Price \$	Catalog Number	List Price \$
Standard commercial switch box cover including stainless steel plates	None	SMFFN1		—	—
NEMA 1 surface mounted enclosure or gray flush plate	None	SMFFN10		SMFFN20	
	High	SMFFN11		SMFFN21	
	Low	SMFFN12		SMFFN22	
	Forward	SMFFN13		—	—
	Reverse	SMFFN14		SMFFN24	

^① Pilot lights can be field installed on standard NEMA 1 general purpose surface mount enclosures, and NEMA 3R, 4 and 12 enclosures only. For flush mounting units a complete switch unit with pilot light must be ordered.

• Revised •
09/10/15

Field Modification Kits

Class 11 - 3RV

Selection

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	Description		Type	Catalog Number	List Price \$
	Auxiliary Contact Blocks				
 3RV2901-1D	Plug in contact block 1 block per 3RV mountable at the front	1 SPDT contact, NO/NC 1 NO + 1 NC 1 SPDT contact NO/NC electronic contact ^④		3RV2901-1D 3RV2901-1E 3RV2901-1G	
	Side mount auxiliary contact with screw connection 1 side mount auxiliary contact per 3RV mountable on the left-hand side	1 NO + 1 NC 2 NO 2 NC 2 NO + 2 NC		3RV2901-1A 3RV2901-1B 3RV2901-1C 3RV2901-1J	
 3RV2901-1A	Signaling Contact Block				
	Signaling contact 1 signaling contact per 3RV mountable on the left-hand side. Can also be fitted together with side mount auxiliary contact.	1NO + 1NC for any trip + 1NO + 1NC for short circuit trip only.		3RV2921-1M	
 3RV2922-1CP0	Auxiliary Releases				
	Undervoltage release 1 undervoltage release per 3RV mountable on the right-hand side. Cannot be fitted together with shunt trip.	AC 50Hz — 230V 415V	AC 60Hz 120V 208V 240V 480V	3RV2902-1AF0 3RV2902-1AM1 3RV2902-1AP0 3RV2902-1AV1	
 3RV2922-1CP0	Undervoltage release with early make contacts (2NO) 1 undervoltage release per 3RV mountable at the right-hand side. Cannot be fitted together with shunt trip.	AC 50Hz 230V 415V	AC 60Hz 240V 480V	3RV2922-1CP0 3RV2922-1CV1	
	Shunt trip 1 shunt trip per 3RV mountable at the right- hand side. Cannot be fitted together with undervoltage release.	AC 50Hz/60Hz ^① 20–24V 90–110V 200–240V 350–415V	DC ^② 20–70V 70–190V 190–330V 330–500V	3RV2902-1DB0 3RV2902-1DF0 3RV2902-1DP0 3RV2902-1DV0	
 3RV2902-1DP0	Pilot Lights AC 50Hz/60Hz				
	For NEMA 1 enclosure only. Kit includes Red, Green, and Amber lenses	24V 120V 240V 480V 600V		49SBLBJ ^③ 49SBLBF ^③ 49SBLBG ^③ 49SBLBH ^③ 49SBLBE ^③	
 3RV2928-1H	Lug Kit				
	Required for Type E Manual Combination Starter	For 3RV with amp range: 0.11–22A up to 480V Max. 0.11–12.5A up to 575V Max		3RV2928-1H	
 3RV2928-1H	Mounting				
	Push-in Mounting Hole Kit For screw panel mounting of the 3RV	Four mounting holes required for each 3RV.		3RV2928-0B	
 3RV2928-1H	Sealing device				
	Adjustment Dial covers	For sealing the FLA adjustment dial (Kit includes 10 covers)		3RV2908-0P	
 3RV2901-0H	Front mount auxiliary cover	For sealing the front mount auxiliary opening. (Kit includes 10 covers)		3RV2901-0H	
	Door Operators				
 3RV2901-0H	Thru-the-door operators Rotary operating mechanism, rated NEMA 12, lockable with up to 3 padlocks in the OFF position. Includes extension shift and connecting element for the 3RV.	With Black Handle	130 mm depth	3RV2926-0B	
			330 mm depth with supporting bracket	3RV2926-0K	

① 100% on time.
② 5 sec. max. on time.
③ Product Category: PILO.




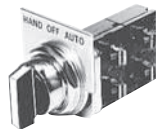
④ Compatible for use in dusty atmospheres. Contacts
rated for 1-300mA @ 3-60V.

Field Modification Kits





Pilot Devices

• Revised •
07/20/15

Selection

Push Buttons and Selector Switches	Class	Enclosure Type	Controller Size or (Lighting Rating)	Type	Catalog Number	List Price \$
 49SBPB5  49SBSB1  49SAP05  49SAS01	14, 40, LC, LEN, CLM [Ⓛ]	Open	00-4	Start, Stop Push Buttons	49SAPB5	
		1	00-4 or (20–100A)	Hand-Off-Auto Selector Switch	49SASB1	
				Off-On Selector Switch	49SASB4	
				Start, Stop Push Buttons	49SBPB5	
			5-8 or (200–400A)	Hand-Off-Auto Selector Switch	49SBSB1	
				Off-On Selector Switch	49SBSB4	
				Start, Stop Push Buttons	49SAP05	
		12, 4/4X	00-8 or (20–400A)	Hand-Off-Auto Selector Switch	49SAS01	
				Keyed Hand-Off-Auto (key removable in all positions)	49SAS09	
				Off-On Selector Switch	49SAS04	
				Start, Stop Push Buttons	49SAP05	
				Hand-Off-Auto Selector Switch	49SAS01	
Keyed Hand-Off-Auto (key removable in all positions)	49SAS09					
22, 43	Open	00-4	Forward-Off-Reverse Selector Switch	49SASB2		
	1	00-4	Forward-Off-Reverse Selector Switch	49SBSB2		
		5-8	Forward, Reverse, Stop Push Buttons	49SAP02		
		12, 4/4X	0-8	Forward-Off-Reverse Selector Switch	49SAS02	
	0-8		Forward, Reverse, Stop Push Buttons	49SAP02		
			Forward-Off-Reverse Selector Switch	49SAS02		
30 (2S1W)	Open	0-4	High-Off-Low Selector Switch	49SASB3		
	1	0-1 ¾	High-Off-Low Selector Switch	49SBSB3		
		2-4	High, Low, Stop Push Buttons	49SAP03		
			12, 4/4X	0-4	High-Off-Low Selector Switch	49SAS03
	0-4	High, Low, Stop Push Buttons		49SAP03		
		High-Off-Low Selector Switch		49SAS03		
30 (2S2W)	Open	0-4	High-Off-Low Selector Switch	49SASB3		
	1	0-4	High-Off-Low Selector Switch	49SBSB3		
	12, 4/4X	0-4	High, Low, Stop Push Buttons	49SAP03		
			High-Off-Low Selector Switch	49SAS03		
			Start, Stop Push Buttons	49SAP05		
			Hand-Off-Auto Selector Switch	49SAS01		
17, 18, 36, 37, 83, 84, LED, LEF, LEB, CMN [Ⓛ] , CMF [Ⓛ] , CMB [Ⓛ]	1, 12, 4/4X	0-8 (20-400A)	Keyed Hand-Off-Auto (key removable in all positions)	49SAS09		
			Off-On Selector Switch	49SAS04		
			Forward, Reverse, Stop Push Buttons	49SAP02		
			Forward-Off-Reverse Selector Switch	49SAS02		
			High, Low, Stop Push Buttons	49SAP03		
			High, Low, Stop Push Buttons	49SAP03		
25, 26	1, 12, 4/4X	0-8	Forward, Reverse, Stop Push Buttons	49SAP02		
32	1, 12, 4/4X	0-4	Forward-Off-Reverse Selector Switch	49SAS02		
			High, Low, Stop Push Buttons	49SAP03		

① To be used for replacement of switch only. Does not include relay or extra contact block on 30-400A CLM and CM Lighting Contactors. Class 49SB not available for these devices.

Description	Class	Enclosure Type	Controller Size or (Lighting Rating)	Lens Color(s)	Legend(s)	Voltage	Catalog Number	List Price \$
 49SBLBF	14, 40, 22 ^② , 43 ^② , 30 (2S2W) ^③ , LC, LEN, CLM	1	00–4 or (20–200A)	Red, Green, Amber	ON, RUN, OFF ^① , OL TRIPPED ^⑤ , FORWARD, REVERSE, LOW, HIGH	24 Vac 120 Vac 208/240/277 Vac 480 Vac 600 Vac	49SBLBJ 49SBLBF 49SBLBG 49SBLBH 49SBLBE	
		1 12, 4/4X	5–8 or (300–400A) 0–8 or (20–400A)	Red (Transformer Type)	ON	24 Vac (Full Voltage) 120 Vac 240 Vac 480 Vac 600 Vac	49SPL0BRJ 49SPL0BRF 49SPL0BRG 49SPL0BRH 49SPL0BRE	
				Green (Transformer Type)	OFF ^④	24 Vac (Full Voltage) 120 Vac 240 Vac 480 Vac 600 Vac	49SPL0AGJ 49SPL0AGF 49SPL0AGG 49SPL0AGH 49SPL0AGE	
			0–4	Red, Green, Amber	ON, RUN, OFF ^① , OL TRIPPED ^⑤ , FORWARD, REVERSE, LOW, HIGH	24 Vac 120 Vac 208/240/277 Vac 480 Vac 600 Vac	49SBLBJ 49SBLBF 49SBLBG 49SBLBH 49SBLBE	
				Red (Transformer Type)	ON	24 Vac (Full Voltage) 120 Vac 240 Vac 480 Vac 600 Vac	49SPL0BRJ 49SPL0BRF 49SPL0BRG 49SPL0BRH 49SPL0BRE	
				Green (Transformer Type)	OFF ^④	24 Vac (Full Voltage) 120 Vac 240 Vac 480 Vac 600 Vac	49SPL0AGJ 49SPL0AGF 49SPL0AGG 49SPL0AGH 49SPL0AGE	
 49SPL0BRF	30 (2S1W) ^② 17, 18, 25 ^② , 26 ^② , 32 ^② , 36, 37, 81, 83, 84, 87, 88, LC, LED, LEF, LEB, CMN, CMF, CMB	1	0–4	Red, Green, Amber	ON, RUN, OFF ^① , OL TRIPPED ^⑤ , FORWARD, REVERSE, LOW, HIGH	24 Vac 120 Vac 208/240/277 Vac 480 Vac 600 Vac	49SBLBJ 49SBLBF 49SBLBG 49SBLBH 49SBLBE	
		1	2–4	Red (Transformer Type)	ON	24 Vac (Full Voltage) 120 Vac 240 Vac 480 Vac 600 Vac	49SPL0BRJ 49SPL0BRF 49SPL0BRG 49SPL0BRH 49SPL0BRE	
		12, 4/4X	0–4	Green (Transformer Type)	OFF ^④	24 Vac (Full Voltage) 120 Vac 240 Vac 480 Vac 600 Vac	49SPL0AGJ 49SPL0AGF 49SPL0AGG 49SPL0AGH 49SPL0AGE	
		1, 12, 4/4X	0–6 (20–400A)	Red (Transformer Type)	ON	24 Vac (Full Voltage) 120 Vac 240 Vac 480 Vac 600 Vac	49SPL0BRJ 49SPL0BRF 49SPL0BRG 49SPL0BRH 49SPL0BRE	
				Green (Transformer Type)	OFF ^④	24 Vac (Full Voltage) 120 Vac 240 Vac 480 Vac 600 Vac	49SPL0AGJ 49SPL0AGF 49SPL0AGG 49SPL0AGH 49SPL0AGE	
 49SBLBL	Lens Kit ONLY (30 (2S1W)) (14, 40, 22, 43, 30 (2S2W), LC, LEN, CLM)	1	0–1 ¾ 00–4 or (20–200A)	Red, Green, Amber	—	—	49SBLBL	
	LED bulb BA9s type Used to replace incandescent or LED bulbs ^⑥	—	—	Red Green Amber White	—	24 V AC/DC	52AED2 52AED3 52AED4 52AEDB	
		—	—	Red Green Amber White	—	120 - 600 V AC/DC	52AEB2 52AEB3 52AEB4 52AEBB	

① “Off” PL requires: (1) N.C. aux contact, 49AB01 on sizes 00–4.
② Class 22, 25, 26, 30, 32, 43, 83 & 84 requires qty. of (2) pilot light kits. Does not apply to 49SB kits. Select appropriate legend plate as a separate item per

type of starter; either “FORWARD” & “REVERSE” or “LOW” & “HIGH”.
③ 2S2W is starter size 0–4.
④ Includes NC aux contact for NEMA starter Size 0–4.

⑤ The “OL TRIPPED” pilot light with a bimetal OLR, requires the OLR to have a N.O. contact as well as a N.C. contact.
⑥ LED bulb applies to only 49SP* pilot lights. They do not apply to 49SB* pilot lights.

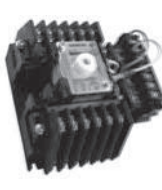
Field Modification Kits

NEMA, Lighting and Heating Contactors, 20 Amp CLM, CMB, CMF, CMN

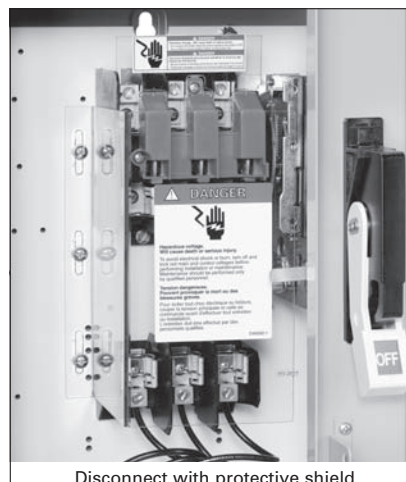
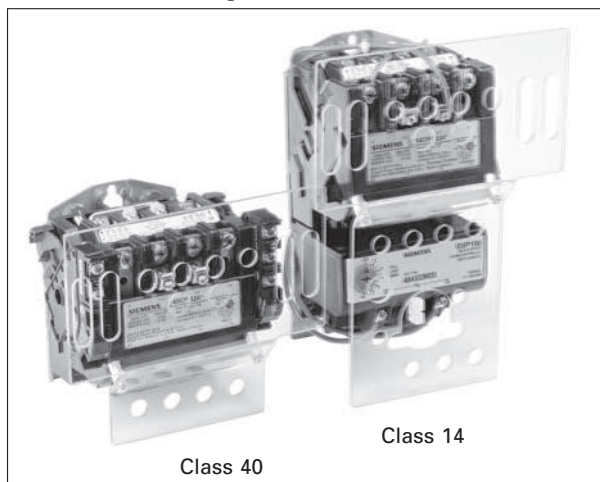
• Revised •
02/12/16

Selection

Solid State Control Module Kits For Lighting and Heating Contactors^①

	CLM 20 Amp Contactor Kit Description	Accessory	Catalog Number	List Price \$	Accessory	Catalog Number	List Price \$	Accessory	Catalog Number	List Price \$
	120V AC, 50/60 Hz	47 (2-Wire Control) (2W)	CLM4379771		48 (3-Wire Control) (3W)	CLM4379781		49 (Start/Stop Control) (3WS)	CLM4379791	
	24V AC/DC, 50/60 Hz		CLM4379772			CLM4379782			CLM4379792	
	240/277V AC, 50/60 Hz		CLM4379773			CLM4379783			CLM4379793	

Protective Shielding for NEMA Products





Class 14, 22, 30, 40, 43

Contactor or Starter Size	00-1½	List Price \$	2-2½	List Price \$	3-3½	List Price \$	4	List Price \$
Contactor Shield Catalog Number	49PSC1		49PSC2		49PSC3		49PSC4	
Starter Shield Catalog Number	49PSS1		49PSS2		49PSS3		49PSS4	

Class 17, 25, 32, 87







Disconnect Size	Catalog Number	List Price \$
30A	49PSD5	
60 & 100A	49PSD6	
200A	49PSD7	

Power Pole Kits	Class	Enclosure type	Contactor Size (Amp)	Description	Field Kit Catalog No.
	LC	Open, 1, 12, 4/4X	30	Single power pole Double power pole	49LCCP1A 49LCCP2A



Electrically Held to Mechanically Held Conversion Modules	Class	Enclosure type	Contactor Size (Amp)	Description	Field Kit Catalog No.
	LC	Open, 1, 12, 4/4X	30	2-wire, 24VAC 2-wire, 110-120VAC 2-wire, 200-277VAC 3-wire, 24VAC 3-wire, 110-120VAC 3-wire, 200-277VAC	49LCCM1A 49LCCM2A 49LCCM3A 49LCCM4A 49LCCM5A 49LCCM6A

^① These kits are only for use with 20A mechanically held lighting contactors.


Starter/Contactor Auxiliary Contact Kits

Description	Class	Size	Type	Catalog Number	List Price \$
	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, 87, 88	00-4	1 NO	49AB10	
			1 NC	49AB01	
			1 NC Early Break	49AB01EB	
			1 NC Late Break	49AB01LB	
			1 NC Extra Late Break	49AB01XLB	
			1 NO Extra Late Make	49AB10XLM	
			1 NO & 1 NC	49AB11	
			2 NO	49AB20	
			4 NO	49AB40	
			3 NO & 1 NC	49AB31	
			2 NO & 2 NC	49AB22	
			2 NO	3RH1921-1EA20	
			1 NO & 1 NC	3RH1921-1DA11	
			2 NC	3RH1921-1EA02	
	14, 17, 18, 22, 25, 26, 36, 37, 40, 43, 87, 88	5, 6	2 NO	49CAL18-11	
			1 NO & 1 NC (Inside L or R)	49CAL18-11B	
	14, 17, 18, 22, 25, 26, 40, 43	7, 8	1 NO & 1 NC (Outside L or R)	49CAL18-11B	
			1 NO & 1 NC (Outside L or R)	49CAL18-11B	
	LC	30	1 NO/NC	49LCAC1PA	
			2 NO/NC	49LCAC2PA	
	LE	20	Front Mounted 1 NO/NC	3RH2911-1HA11	
		30	Side Mounted 1 NO/NC	3RH2911-1DA11	
		60-400	Side Mounted 1 NO/NC	3RH1921-1EA11	
		60-400	Side Mounted 1 NO/NC	3RH1921-1EA11	
	CLM, CMN, CMF, CMB	20 Amps	1 NO/NC SPDT	CLM4097291	
		20 Amps	2 NO/NC SPDT	CLM4097292	
		30-200 Amps	1 NO & 1 NC	CLMFCAK11	
			2 NC	CLMFCAK02	
			2 NO	CLMFCAK20	
			1 Coil Clearing NO & NC	CLMFCAK11	
		300-400 Amps	1 NO & 1 NC	CLMHCAK11	
			2 NC	CLMHCAK02	
			2 NO	CLMHCAK20	
			1 Coil Clearing NO & NC	CLMHCAK11	

Disconnect Auxiliary Switch Kits

Description	Class	Disconnect Amp or CB Rating	Type	Catalog Number	List Price \$
Non-fusible or Fusible Type 	17, 25, 32, 37, 83, 84, 87, 88, LED, LEF, CMN, CMF	30 - 200A	2 NO/2 NC DPDT (NEMA A600)	HA261234	
MCP 	18, 26, 32, 37, 83, 84, 87, 88, LEB, CMB	3A-125A	1 NO/1 NC 240V	A02ED62	
		250A	1 NO/1 NC 480V	A02FD64	
		400A-600A	(2) 1 NO/1 NC SPDT-480V	A02JLD64	

Control Power Transformer Kits^{①③}

Description	Recommended Transformer Size		VA Rating	Catalog Number	List Price \$	Transformer Table		
	Control Size	Transformer VA				Primary Volts	Secondary Volts	Code
 Transformer 50/60HZ	00-2½	45 or 50 ^③	45 VA	KT*050 ^{②③}		120	24	1
	3-3½	75	50 VA	KT*050P ^③		208	24	G
	4	150	100 VA	KT*100		208	120	H
	5-6	150	150 VA	KT*150		240/480	24	4
	7-8	300	200 VA	KT*200		240/480	120	8
	Lighting Control		300 VA	KT*300		277	24	5
	CLM		500 VA	KT*500		277	120	7
	20A, 2 - 12P	150				600	24	6
	30A, 3P	100				600	120	9
	30A, 6 - 12P	200						
	60A, 3P	100						
	60A, 4 - 6P	150						
	60A, 8 - 12P	250						
	100/200A, 3P	200						
	100/200A, 5P	250						
	300/400A, 3P	250						
	LC & LE							
	LC 30A, 2-12P	100						
	LE 20, 30, 60A, 3 & 4P	45						
	LE 30A, 6P	45						
	LE 30A, 9-12P	100						
	LE 60A, 6-12P	150						
	LE 100, 200A, 3P	100						
	LE 300, 400A, 3P	150						
			Replace * with code from Transformer table. Kits used with NEMA 1 general purpose lift-off cover type require extra wide enclosure.					
			Class 14 Sizes 0-2½					
			Class 30 (2S2W) Sizes 0-2½					
			Class 30 (2S1W) Sizes 0-1½					

① Installation of CPTs may require a larger enclosure.
② 45VA transformer kits will include secondary but not primary fusing. Sizes 50VA and higher include

2-pole primary fusing and 1-pole secondary fusing.

③ For 24VAC control a minimum of 100VA CPT is required.










Field Modification Kits

ESP200 Accessories

• Revised •
09/28/15

Selection

Accessories

Description		Catalog Number	List Price \$
	ESP200 Tamper Resistance Cover	49ASTC1 3UB89848	
	ESP100/200 Mounting Plate	Frame Size	Controller Size
		A or A1	00 - 1 3/4
		B	2 - 2 1/2
		B	3-4
	Mounting Kit	49ASMS1	
	Universal Reset Operator 8" for class 36, 37 and 87 in NEMA 1, 12 and 3/3R	49MARB	
	Single Reset (blue) for class 14, 17, 18, 22, 25, 26, 30 and 32 in NEMA 1, 12 and 4/4X	49MBRS	
	Single Reset (red) for class 14, 22 and 30 in NEMA 4/4X	49MARSR	
	ESP200 Reset Extender	49ASRE	
	Protective Boot Offers protection from ice and foreign substances from interfering with button operation. For use with 49MARSR reset.	52AABA	
	Current Transformer 300:5 use with 3UB81234JW2	97CT005	
	Current Transformer 400:5 use with 3UB81234KW2	97CT006	
	Current Transformer 600:5 use with 3UB81234LW2	97CT008	
	Current Transformer 750:5 use with 3UB81234MW2	97CT009	
	Current Transformer 1200:5 use with 3UB81234NW2	97CT012	

• Revised •
02/12/16

Field Modification Kits

NEMA Accessories

Selection

Miscellaneous Kits

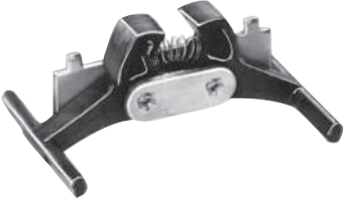











Description		Class	Encl. Type	Controller Size	Catalog Number	List Price \$
 <p>Mechanical Interlock for Horizontally Mounted Contactors</p>	Includes wire	14, 40	Open	00-1 1 1/4 2, 2 1/2 3, 3 1/2 4	49CCF22H 49EEF22H 49GGF22H 49HHP22H 49JJG22H	
	Interlock Only			5, 6	3RA1954-2A	
	Wire Kit Only	14, 40	Open	5	3RA1963-2A 3RA1973-2A	
	Base Plate Only			5 6	3RA1962-2A 3RA1972-2A	
	Mechanical Interlock	14, 40	Open	7 8	49VM750H 49VM1650H	
	Includes wire & mounting plate	14, 40	Open	00-1 1 1/4 2, 2 1/2 3, 3 1/2 4	49CCF22HP 49EEF22HP 49GGF22HP 49HHP22HP 49JJG22HP	
	Includes mounting plate (Different Frame Sizes)	14, 40	Open	Left 2, 2 1/2 3, 3 1/2 Right 2, 2 1/2 3, 3 1/2	49L107944 49L107945	
 <p>CAT. No. 49DSM</p> <p>Surge Suppressor</p>	Surge Suppressor for 120V AC coil. Limits transient voltage produced by the coil to 220% maximum peak line volts.	All but Class LC, LE, CLM	All	00-4 ^①	49D26344	
 <p>Auxiliary Power Pole</p>	NO 36A at 600V AC Max NC 25A at 600V AC Max	All but Class LC, LE, CLM	All	00-1 1/4	49SAF0 49SAFC	
 <p>Main Contacts Lighting Contactors</p>	Top or Bottom, 2-Pole Top, 3-Pole Top or Bottom, 4-Pole Top or Bottom, 6-Pole	CLM	All	20 Amps	CLM4097331 CLM4097332 CLM4097333 CLM4097334	
 <p>Load Side Power Take Off Kit</p>	Includes 3 power lugs for making extra connections to the load side of the contactor	All but Class LC, LE, CLM	All	00-1 1/4	49SAE	
 <p>Lug Kit for Contactors</p>	For AL/CU Wire	14, 40	All	2-2 1/2 3-3 1/2 4 Line 4 Load	49SAAF ^③ 49SAAH ^③ 75D35994002 ^③	
	For AL/CU Wire	14, 40	All	5, 6	3RT1966-4G ^②	
	Use CU Only	14, 40	All	7 8	49ZATK750-3 ^② 49ZATK1650-6 ^②	
 <p>Three Conductor Ground Lug Kit Meets UL 508 and CSA Standard 22.2 No 14-1973</p>	2-14 AWG AL/CU Wire	All	All	All	75D28182001	
 <p>Lightning Arrestor</p>		All	All	All	49D45584002	
 <p>Backspin Timer</p>	On delay timer that reduces risk of starting into a backspin	87, 88	All	All	3RP2025-1AQ30 3RP2025-1AP30	
 <p>Hole Plug</p>	Covers the hole that is typically used for the conduit hub	87	All	1-4	49D41149006	
 <p>Hole Plug</p>	Covers the hole in the enclosure door/cover normally filled by overload reset 49MBRS. Hole plug is used for enclosed contactors.	40, 43, LC, LE, CLM & CM	1	All	49MZPB2	

Illustration	Description	Contactors	Wire Size	Catalog Number	List Price \$
 <p>3RT1966-4G</p>	<p>Lug Kit</p> <p>1 Kit = 1 Terminal block. 1 kit necessary for each line and load.</p>	<p>NEMA size 4 (Vacuum)</p> <p>NEMA size 5</p> <p>NEMA size 6</p>	<p>2/0 to 600 MCM, max. one 500MCM & one 600MCM</p>	3RT1966-4G	

① Surge Suppression for NEMA sizes 5 – 8 are supplied internal with the coil. For size 4 panel mount.

② Only 3 lugs are supplied for line or load. If lugs for line and load are required order 2 kits.

③ Lug Kit for contactors include 3 lugs for line or load. 75D35994001 for line side. 75D35994002 for load side.

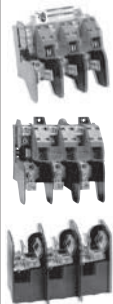
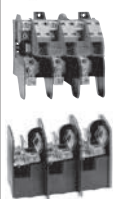
Field Modification Kits

NEMA Accessories



• Revised •
07/20/15

Selection


Fused and Non-Fused Disconnect Switch Kits^②

	Basic Switch Ampere Rating	Switch Catalog Number Non-Fused	List Price \$	Switch Catalog Number Fused	List Price \$	Kit Description	Load Base Catalog Number Class J	List Price \$	Load Base Catalog Number Class H ^③	List Price \$	Lug Wire Size
	30	HNB612		HFB21		30A, 250V	—	—	HBB21		#14-2 AWG (Cu/Al)
				HFB612		30A, 600V	HBB612		HBB612		
	60	HNB623		HFB22		60A, 250V	—	—	HBB22		#14-2 AWG (Cu/Al)
				HFB62		60A, 600V	HBB62		HBB62		
	100	HNB623		HFB63		100A, 250V	—	—	HBB63		#14-1/0 AWG (Cu/Al)
	200	HNB64		HFB64		100A, 600V	HBB63		HBB64		#6-300 AWG (Cu/Al)
						200A, 250V	—	—			
						200A, 600V	HBB64				



Class R Fuse Conversion Kits

	Catalog Number	Description	List Price \$
	HR21	30A, 240V	
	HR612	30A, 600V	
	HR612	60A, 240V	
	HR62	60A, 600V	
	HR63	100A, 240/600V	
	HR64	200A, 240/600V	

Hazardous Location Accessories For Enclosure Types 7 & 9

		Description	Conduit Size Inches	Catalog Number	List Price \$
Breather/Drain		Install in bottom as drain. Install in top as breather. Suitable for Class I groups C & D and for Class II groups F & G applications only. for 1/2" NPT.		51AADB	



Conduit Hubs

Description			Conduit Size	Class	Controller Size	Enclosure Type	Catalog Number	List Price \$
	Conduit Hubs For Enclosures Noncombination - NEMA 12 may be field modified for NEMA 3/3R. Combination - NEMA 12 may be field modified for NEMA 3/3R/4 enclosure. Use UL Listed conduit hub for the appropriate NEMA type.	Metal Hub	3/4"	All	All	12, 3, 3R, 4	49MACML 49MACMD 49MACMN 49MACMF 49MACMG	
			1"					
			1 1/2"					
			2"					
			2 1/2"					
	NEMA 3R requires the location of the conduit hub to be at a level above the lowest live part and holes of 1/8" dia. to be added in the bottom of the enclosure. Does not apply to class 87 Pump Panels.	Metal Hub	1"	81, 87	All	3R	75D41149001 75D41149003 75D41149004 75D41149005	
			1 1/2"					
			2"					
			2 1/2"					

① Product Category: PILO.
② Product Category: HDSS.

③ For Class R fuses order Class H kit from this table and the Class R conversion kit.

Sirius 3RB20

Illustration	Description		For Overload Type	Catalog Number	List Price \$
 Reset plunger with reset button  Flexible reset	Reset mechanisms				
	Reset plunger Mounts directly to overload relay. Requires separate reset operator in enclosure door. Kit includes reset plunger, holder and funnel.		3RB206	3RU1900-1A	
	Flexible cable reset mechanism Requires a 6.5 mm hole in the enclosure with a maximum enclosure thickness of 8 mm.	Cable length 15.75 in (400mm)	3RB206	3RU1900-1B	
		Cable length 23.62 in (600mm)		3RU1900-1C	
	Covers Tamper resistant cover for current setting and manual/automatic reset button.		3RB206	3RB2984-0	

Competitive Retrofit Overload Plates

Manufacturer	NEMA Size	Plate Part Number	List Price \$
A-B	0, 1	49D57090	
A-B	2	49D57161	
Sq. D	0, 1	49D57091	

Electronic Coil System with Remaining Lifetime Indication and 24VDC PLC Output

Class	Size	Model Type	21 - 27V		96 - 127V		200 - 277V	
			Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
All	5	P	—	—	3RT1965-5PF31		3RT1965-5PP31	
		V	—	—	3RT1966-5PF31		3RT1966-5PP31	
	6	P	—	—	3RT1975-5PF31		3RT1975-5PP31	
		V	—	—	3RT1976-5PF31		3RT1976-5PP31	






Field Modification Kits

Class MT, MTG



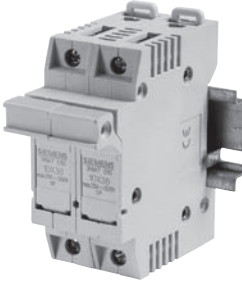


• Revised •
03/25/15

Selection

Fuse Blocks, Touch-Safe Terminal Covers

Catalog Number	Description	List Price \$
KCCF1G	SECONDARY FUSE BLOCK, 1P, 250V MAX	
	SINGLE POLE FUSE BLOCK COVER KIT	
KCCFBCK		
	2 Pole PRIMARY FUSE BLOCK, 2P, 600V MAX (block only)	
KCCFP2RG		
	2 Pole PRIMARY FUSE BLOCK KIT with wire Leads	
KCCFPX2R		
US2:49FCCPT	Secondary Fuse Clips, 2 per pack	
US2:49JUCPT	Terminal Jumpers	
	Terminal touchsafe cover Secondary Side: VAs 45 thru 350	
US2:KCCSECFVR		
	Terminal touchsafe cover Secondary Side: VAs 500 thru 2K	
US2:KCCSECFVR2		
US2:KCCFP3POLE	3 pole fuse blk (2 pole primary and 1 pole secondary)	

International Fusing^①

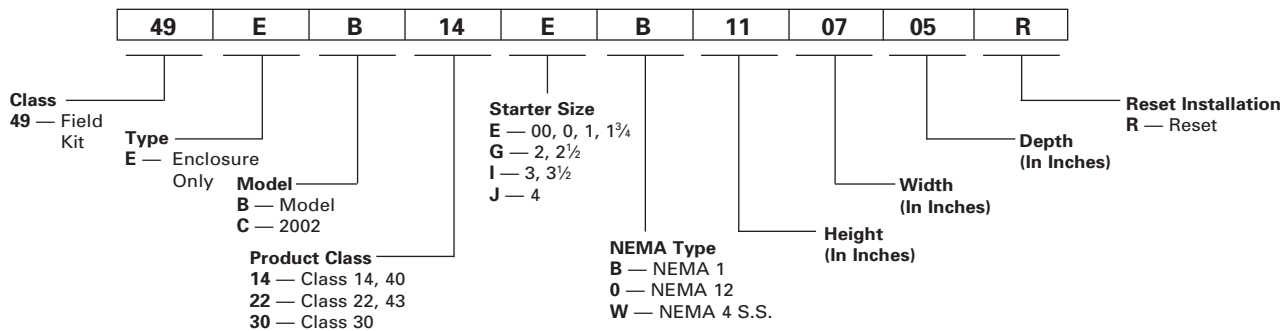
Catalog Number	Description	List Price \$
	1-Pole Fuse Block, Touch-Safe. Up to 6.3A for 5 mm x 20 mm or 5 mm x 25 mm (Requires DIN Rail Mounting)	
8WA1011-1SF12		
	1-Pole Fuse Block, Touch-Safe 32A, for 10 x 38 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
3NW7013		
	2-Pole Fuse Block, Touch-Safe 32A, for 10 x 38 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
3NW7023		
	1-Pole Fuse Block, Touch-Safe 4-50A, for 14 x 51 mm Cylindrical Fuses. (Requires DIN Rail Mounting.)	
3NW7111		
	Fuse Block DIN Rail Mounting for separate screw mounting to panel. (Max 2-pole 2-25A size per rail.) (Max 1-pole 4-50A size per rail.)	
8WA1815		

^① Product Category: IEC.

• Revised •
07/20/15

Heavy Duty Control Non-Combination Enclosure Kits, Class 49

Selection



Non-Reversing Starters & Contactors Class 14, 40

Size	NEMA 1 General Purpose (Clamshell)②④					NEMA 4/4X Stainless① Watertight, Dust-tight, Corrosion Resistant③⑥					NEMA 12/3/3R① Industrial Use, Weatherproof③⑤				
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
	Model C Enclosure		Model C Enclosure			Model B Enclosure		Model B Enclosure			Model B Enclosure		Model B Enclosure		
	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$
00-1¼	49EC14EB110705R		49EC14IB201208R	200		49EB14EW130806R		49EB22EW131306R			49EB14E0130806R		49EB22E0131306R		
2, 2½	49EC14GB140807R		49EC14IB201208R	200		49EB14GW160907R		49EB22GW161406R			49EB14G0160907R		49EB22G0161406R		
3, 3½	49EC14IB201208R		49EC14IB201208R	100		49EB14JW261408R		49EB14JW261408R			49EB14J0261408R		49EB14J0261408R		
3, 3½	—	—	49EC14JB251409R	250	—	—	—	—	—	—	—	—	—	—	—
4	49EC14JB251409R		49EC14JB251409R	300		49EB14JW261408R		49EB22JW302410R			49EB14J0261408R		49EB22J0302410R		

Reversing Starters & Reversing Contactors Class 22, 43

Size	NEMA 1 General Purpose (Clamshell)②④					NEMA 4/4X Stainless① Watertight, Dust-tight, Corrosion Resistant③⑥					NEMA 12/3/3R① Industrial Use, Weatherproof③⑤				
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
	Model C Enclosure		Model C Enclosure			Model B Enclosure		Model B Enclosure			Model B Enclosure		Model B Enclosure		
	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$
00-1¼	49EC14IB201208R		49EC14IB201208R	200		49EB22EW131306R		49EB22EW131306R			49EB22E0131306R		49EB22E0131306R		
2, 2½	49EC14IB201208R		49EC14IB201208R	200		49EB22GW161406R		49EB22GW161406R			49EB22G0161406R		49EB22G0161406R		
3, 3½	49EC14JB251409R		49EC14JB251409R	250		49EB22JW261808R		49EB22JW302410R			49EB22J0261808R		49EB22J0302410R		
4	49EC14JB251409R		49EC14JB251409R	300		49EB22JW302410R		49EB22JW302410R			49EB22J0302410R		49EB22J0302410R		

Two-Speed Two-Winding Starters Class 30

Size	NEMA 1 General Purpose (Clamshell)②④					NEMA 4/4X Stainless① Watertight, Dust-tight, Corrosion Resistant③⑥					NEMA 12/3/3R① Industrial Use, Weatherproof③⑤				
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
	Model C Enclosure		Model C Enclosure			Model B Enclosure		Model B Enclosure			Model B Enclosure		Model B Enclosure		
	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$
0-1¼	49EC14IB201208R②		49EC14JB251409R②	200		49EB30EW131306R		49EB30GW161808R			49EB30E0131306R		49EB30G0161808R		
2, 2½	49EC14IB201208R②		49EC14JB251409R②	200		49EB30GW161406R		49EB30GW161808R			49EB30G0161406R		49EB30G0161808R		
3, 3½	49EC14JB251409R②		49EB22JB302410R③	300		49EB30JW261808R		49EB22JW302410R			49EB30J0261808R		49EB22J0302410R		
4	49EC14JB251409R②		49EB22JB302410R③	300		49EB22JW302410R		49EB22JW302410R			49EB22J0302410R		49EB22J0302410R		

Two-Speed One-Winding Starters Class 30

Size	NEMA 1 General Purpose (Clamshell)②④					NEMA 4/4X Stainless① Watertight, Dust-tight, Corrosion Resistant③⑥					NEMA 12/3/3R① Industrial Use, Weatherproof③⑤				
	Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
	Model C Enclosure		Model C Enclosure			Model B Enclosure		Model B Enclosure			Model B Enclosure		Model B Enclosure		
	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$	Catalog Number	List Price \$	Catalog Number	Max CPT VA	List Price \$
0-1¼	49EC14IB201208R②		49EC14JB251409R②	200		49EB30EW131306R		49EB30GW161808R			49EB30E0131306R		49EB30G0161808R		
2, 2½	49EB30GB161808R③		49EB22JB302410R③	300		49EB30GW161808R		49EB22JW261808R			49EB30G0161808R		49EB22J0261808R		
3, 3½	49EB30IB192208R③		49EB22JB302410R③	300		49EB22JW302410R		49EB22JW302410R			49EB22J0302410R		49EB22J0302410R		
4	49EB22JB302410R③		49EB22JB302410R③	300		49EB22JW302410R		49EB22JW302410R			49EB22J0302410R		49EB22J0302410R		

Note: Dimensions...See appropriate Product Class Outline Drawing beginning on page 9/157.

① For conduit hubs and conversion instructions, see page 9/110.

② Clamshell enclosure suitable for one operating device and two pilot lights. See Field Mods page 9/104.

③ Hinged cover enclosures, except for 49EB14E0130806R, are suitable for one or more class 52 operating devices and one or more class 52 pilot lights. See Field Mods page 9/100.

④ Install NEMA 1 hole plug cat. no. **3SB1902-0AR** (included) when the cover OL reset is not needed.

⑤ Install NEMA 12 hole plug cat. no. 52ABH6 (not included) when the cover OL reset is not needed.

⑥ Install NEMA 4X stainless steel hole plug cat. no. 52ABHS (not included) when the cover OL reset is not needed.

Heavy Duty Control Lighting Enclosure Tables

• Revised •
02/12/16

Selection

Lighting Contactors Class LC and LE

Contactor	Type 1 ¹⁾			Type 4/4X Stainless Steel ²⁾			Type 3/3R/12 ³⁾		
	Without CPT	With CPT	Max.	Without CPT	With CPT	Max.	Without CPT	With CPT	Max.
	Catalog Number	Catalog Number	CPT VA	Catalog Number	Catalog Number	CPT VA	Catalog Number	Catalog Number	CPT VA
LC 30A 2-12P	49EC14GB140807R	49EC14IB201208R	200	49EB22GW161406R	49EB30GW161808		49EB22G0161406R	49EB30G0B161808	
LE 20, 30A 3-4P	49EC14EB110705R	49EC14IB201208R	200	49EB22GW161406R	49EB22GW161406R		49EB22G0161406R	49EB22G0161406R	
LE 30A 6-9P	49EC14IB201208R	49EC14IB201208R	200	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 30A 12P	49EC14IB201208R	49EC14JB251409R	250	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 60A 3P	49EC14GB140807R	49EC14IB201208R	200	49EB22GW161406R	49EB22GW161406R		49EB22G0161406R	49EB22G0161406R	
LE 60A 6-9P	49EC14IB201208R	49EC14IB201208R	200	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 60A 12P	49EC14IB201208R	49EC14IB201209R	250	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	
LE 100A 3P	49EC14IB201208R	49EC14IB201208R	200	49ECLXXW161406	49EB14JW261408R		49ECLXX0161406	49EB14J0261408R	

Lighting & Heating Contactors Class CLM

Size	Pole	NEMA 1 General Purpose (Clamshell) ^{②④}					NEMA 4/4X Stainless ^① Watertight, Corrosion Resistant ^{③④}					NEMA 12/3/3R ^① Industrial Use ^{③⑤}				
		Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)			Without CPT		With CPT (Extra Wide)		
		Model C/B Enclosure	List Price \$	Model C/B Enclosure	Max CPT	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT	List Price \$	Model B Enclosure	List Price \$	Model B Enclosure	Max CPT	List Price \$
		Catalog Number		Catalog Number			Catalog Number		Catalog Number			Catalog Number		Catalog Number		
20A	2-12	49EC14GB140807R		49EC14IB201208R	200VA		49EB22GW161406R		49EB22GW161406R	—		49EB22G0161406R		49EB22G0161406R	—	
30A	2-5	49EC14EB110705R		49EC14IB201208R	200VA		49EB22GW161406R		49EB22GW161406R	—		49EB22G0161406R		49EB22G0161406R	—	
30A	6-12	49EB30GB161808R		49EB30GB161808R	200VA		49ECLXXW161406		49EB30GW161808R	—		49ECLXX0161406		49EB30G0161808R	—	
60A	2-5	49EC14GB140807R		49EC14IB201208R	200VA		—	—	—	—	—	—	—	—	—	—
60A	6-12	49EB30IB192208R		49EB30IB192208R	250VA		—	—	—	—	—	—	—	—	—	—
100A	2-5	49EC14IB201208R		49EC14IB201208R	200VA		—	—	—	—	—	—	—	—	—	—

Note: Dimensions...See appropriate Product Class Outline Drawing on page 9/170.

① For conduit hubs and conversion instructions, see page 9/110.

② Clamshell enclosure suitable for one operating device and two pilot lights. See Field Mods page 9/104.

③ Hinged cover enclosure suitable for one or more class 52 operating devices and one or more class 52 pilot lights. See Field Mods page 9/104.

④ Install NEMA 1 hole plug cat. no. **3SB1902-0AR** (included) when the cover OL reset is not needed.

⑤ Install NEMA 12 hole plug cat. no. **52ABH6** (not included) when the cover OL reset is not needed.

⑥ Install NEMA 4X stainless steel hole plug cat. no. **52ABHS** (not included) when the cover OL reset is not needed.

Features

- Manufactured with a cold forming "TOX" process
- 100kA short circuit rating when protected with class R fuses to 600V or MCP to 480V and when installing listed components from the instruction guide
- Enclosure types available, Nema 1, 12, 3/3R and painted NEMA 4. Nema 12 field convertible to 3/3R/4 with the appropriate conduit hub and drain hole
- Pre-Drilled mounting panels
- Heavy duty quarter turns
- Industrial type disconnect handle

Disconnect Type Enclosure Kit

- Used to assemble both non-fusible and fusible combination starters
- Accommodates Class 14 full voltage non-reversing (FVNR) NEMA starters 00 – 4 including Siemens exclusive half sizes
- Handle mechanism, power wire, mounting panel, reset assembly, and instruction guide included. Hardware for panel mounted devices and disconnect switch are not included

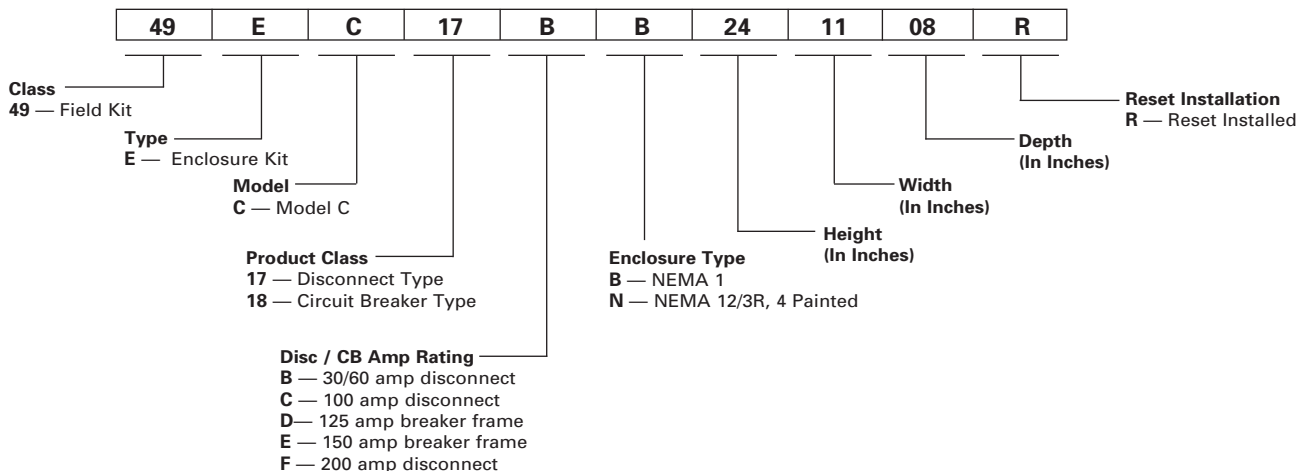
MCP Type Enclosure Kit

- Used to assemble combination starters with circuit breakers
- Accommodates Class 14 full voltage non-reversing (FVRN) NEMA starters 00 – 4 including Siemens exclusive half sizes
- Handle mechanism, power wire, mounting panel, reset assembly and instruction guide included. Circuit breaker not included however, mounting hardware for the circuit breaker is

How to Select the Required Kits to Assemble a Combination Starter

- From the catalog, select a class 14 open type starter with the required starter size and overload relay type.
- Based on the starter size, select the enclosure kit from table 1a for fusible or non-fusible combination starters or select from table 1b for combination starters with an MCP.
- For a non-fusible combination starter, select the disconnect switch kit from table 2a. For a fusible combination starter, select the appropriate disconnect switch, fuse clip kit, and class R rejection kit from table 2b (for H fusing, class R rejection kit not required). For combination starters with MCP, select the appropriate circuit breaker kit from table 3.

Nomenclature for Combination Enclosure Kits



Selection

Table 1a - FVNR Combination Starter Kits for use with Disconnect Devices

Starter Size	Disc. Amp Rating	NEMA 1 General Purpose		NEMA 12, 3/3R, 4 Painted ① Industrial Use, Weatherproof, Watertight, Dust-tight		NEMA 4/4X Stainless Steel Watertight, Dust-tight, Corrosion Resistant	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
0 - 2	60	49EC17BB241108R		49EC17BN241108R		49EC17BW241108R	
2 ½ - 3	100	49EC17CB242008R		49EC17CN242008R		49EC17CW242008R	
3 ½ - 4	200	49EC17FB362408R		49EC17FN362408R		49EC17FW362408R	

Table 1b. – FVNR Combination Starter Kits for use with MCP Devices

Starter Size	Max MCP Amps	NEMA 1 General Purpose		NEMA 12, 3/3R, 4 Painted ① Industrial Use, Weatherproof, Watertight, Dust-tight		NEMA 4/4X Stainless Steel Watertight, Dust-tight, Corrosion Resistant	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
0 - 2	50	49EC18DB241108R		49EC18DN241108R		49EC18DW241108R	
2 ½ - 3	125	49EC18DB242008R		49EC18DN242008R		49EC18DW242008R	
3 ½	125	49EC18DB362408R		49EC18DN362408R		49EC18DW362408R	
4	150	49EC18EB362408R		49EC18EN362408R		49EC18EW362408R	

Table 2a – Non-Fusible Disconnect Kits

Disconnect Switch		
Switch Rating	Catalog Number	List Price \$
30A	HNB612	
60A	HNB623	
100A	HNB623	
200A	HNB64	



Table 2b – Fusible Disconnect Kits

Fuse Clip Ratings	Class	Disconnect Switch		Load Base for Fuse		Rejection Clips for Class R Fusing	
		Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
30A-250V	H	HFB21		HBB21		HR21	
30A-600V	H	HFB612		HBB612		HR612	
60A-250V	H	HFB22		HBB22		HR612	
60A-600V	H	HFB62		HBB62		HR62	
100A-250V	H	HFB63		HBB63		HR63	
100A-600V	H	HFB63		HBB63		HR63	
200A-250V	H	HFB64		HBB64		HR64	
200A-600V	H	HFB64		HBB64		HR64	

Table 3 – Circuit Breaker Kits

Starter Size	MCP Type Used with Solid State Overload Relay			MCP Type Used with Thermal Overload Relay	
	Overload Amp Range	Motor Circuit Interrupter Amps	Circuit Breaker Kit	Motor Circuit Interrupter Amps	Circuit Breaker Kit
0	0.75-3.4 3-12 5.5-22	3 10 25	ED63A003 ED63A010 ED63A025	3 10 25	ED63A003 ED63A010 ED63A025
1	0.75-3.4 3-12 5.5-22 10-40	3 10 25 30	ED63A003 ED63A010 ED63A025 ED63A030	3 10 25 30	ED63A003 ED63A010 ED63A025 ED63A030
1 ½	10-40	40	ED63A040	40	ED63A040
2	13-52	50	ED63A050	50	ED63A050
2 ½	25-100	100	ED63A100	100	ED63A100
3	25-100	100	ED63A100	100	ED63A100
3 ½	50-200	125	ED63A125	125	ED63A125
4	50-200	150	FXD63A150L	150	FXD63A150L

① For conduit hubs and conversion instructions, see page 9/110.

Heavy Duty Control

Class 87 Pump Panel Enclosure Kits

Selection



Ordering Information

- Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order.
- Refer to Class 87 section of catalog for pump panel ratings and other details.
- Handle mechanism, power wire, mounting panel, reset assembly and instruction guide are included with the enclosure kit.

Coil Table

60Hz Voltage	Letter
24	J
120	F
110–120/220–240	A ^①
200–208	D
220–240	G
220–240/440–480	C ^①
277	L
440–480	H
550–600	E

Pump Panels with Solid-State Overload Relay Class 87

To Field Assemble This Pump Panel:	Order these components						Enclosure List Price \$
	Enclosure Catalog Number	Starter with Solid-State Overload Relay	Disconnect Switch	Fuse Load Base	Class R Rejection Clips	Motor Circuit Interrupter	
87DUB6F*	49EB87GF242008	14DUB32A*	HFB612	HBB612	HR612	—	
87DUC6F*	49EB87GF242008	14DUC32A*	HFB612	HBB612	HR612	—	
87DUD6F*	49EB87GF242008	14DUD32A*	HFB612	HBB612	HR612	—	
87DUD60*	49EB87GF242008	14DUD32A*	HFB62	HBB62	HR62	—	
87EUE6F*	49EB87GF242008	14EUE32A*	HFB612	HBB612	HR612	—	
87EUE60*	49EB87GF242008	14EUE32A*	HFB62	HBB62	HR62	—	
87FUF6F*	49EB87GF242008	14FUF32A*	HFB62	HBB62	HR62	—	
87FUF60*	49EB87GF242008	14FUF32A*	HFB63	HBB63	HR63	—	
87GUG6F*	49EB87GF242008	14GUG32A*	HFB62	HBB62	HR62	—	
87GUG60*	49EB87GF242008	14GUG32A*	HFB63	HBB63	HR63	—	
87HUG6F*	49EB87JF362408	14HUG32A*	HFB63	HBB63	HR63	—	
87HUG60*	49EB87JM362408	14HUG32A*	MCS620R	FCK620	SSRK34	—	
87IUH6F*	49EB87JM362408	14IUH32A*	MCS620R	FCK620	SSRK34	—	
87JUH6F*	49EB87JM362408	14JUH32A*	MCS620R	FCK620	SSRK34	—	
87DUC6L*	49EB87GF242008	14DUC32A*	HFB21	HBB21	HR21	—	
87DUD6L*	49EB87GF242008	14DUD32A*	HFB21	HBB21	HR21	—	
87DUE6L*	49EB87GF242008	14DUE32A*	HFB21	HBB21	HR21	—	
87DUE6P*	49EB87GF242008	14DUE32A*	HFB22	HBB22	HR612	—	
87EUE6L*	49EB87GF242008	14EUE32A*	HFB22	HBB22	HR612	—	
87FUF6L*	49EB87GF242008	14FUF32A*	HFB22	HBB22	HR612	—	
87FUF6P*	49EB87GF242008	14FUF32A*	HFB63	HBB63	HR63	—	
87GUG6L*	49EB87GF242008	14GUG32A*	HFB22	HBB22	HR612	—	
87GUG6P*	49EB87GF242008	14GUG32A*	HFB63	HBB63	HR63	—	
87HUG6L*	49EB87JF362408	14HUG32A*	HFB63	HBB63	HR63	—	
87HUG6P*	49EB87JM362408	14HUG32A*	MCS620R	FCK620	SSRK34	—	
87IUH6L*	49EB87JM362408	14IUH32A*	MCS620R	FCK620	SSRK34	—	
87JUH6L*	49EB87JM362408	14JUH32A*	MCS620R	FCK620	SSRK34	—	
87DUB6M*	49EB87GB242008	14DUB32A*	—	—	—	ED63A003	
87DUC6M*	49EB87GB242008	14DUC32A*	—	—	—	ED63A010	
87DUD6M*	49EB87GB242008	14DUD32A*	—	—	—	ED63A025	
87DUE6M*	49EB87GB242008	14DUE32A*	—	—	—	ED63A030	
87EUE6M*	49EB87GB242008	14EUE32A*	—	—	—	ED63A040	
87FUF6M*	49EB87GB242008	14FUF32A*	—	—	—	ED63A050	
87GUG6M*	49EB87GB242008	14GUG32A*	—	—	—	ED63A100	
87HUG6M*	49EB87IB362408	14HUG32A*	—	—	—	ED63A100	
87IUH6M*	49EB87IB362408	14IUH32A*	—	—	—	ED63A125	
87JUH6M*	49EB87JB362408	14JUH32A*	—	—	—	FXD63A150L	


① Dual voltage coils not available in size 5-8 starters.

Heavy Duty Control

Class 87 Pump Panel Enclosure Kits

• Revised •
06/29/16

Selection

	Ordering Information	Coil Table	
		60Hz Voltage	Letter
	<ul style="list-style-type: none"> Replace the (*) with a letter from the coil table. Dual voltage coils are wired on high voltage unless specified on order. Refer to Class 87 section of catalog for pump panel ratings and other details. Handle mechanism, power wire, mounting panel, reset assembly and instruction guide are included with the enclosure kit. 	24 120 110–120/220–240 200–208 220–240 220–240/440–480 277 440–480 550–600	J F A ^① D G C ^① L H E

Pump Panels with Bimetal Overload Relay Class 87

To Field Assemble This Pump Panel:	Order these components						Enclosure List Price \$
	Enclosure Catalog Number	Starter with Bimetal Overload Relay	Disconnect Switch	Fuse Load Base	Class R Rejection Clips	Motor Circuit Interrupter	
87DAE6F*	49EB87GF242008	14DP32A*81	HFB612	HBB612	HR612	—	
87DAE60*	49EB87GF242008	14DP32A*81	HFB62	HBB62	HR62	—	
87EAF6F*	49EB87GF242008	14EP32A*81	HFB612	HBB612	HR612	—	
87EAF60*	49EB87GF242008	14EP32A*81	HFB62	HBB62	HR62	—	
87FAJ6F*	49EB87GF242008	14FP32A*81	HFB62	HBB62	HR62	—	
87FAJ60*	49EB87GF242008	14FP32A*81	HFB63	HBB63	HR63	—	
87GAK6F*	49EB87GF242008	14GP32A*81	HFB62	HBB62	HR62	—	
87GAK60*	49EB87GF242008	14GP32A*81	HFB63	HBB63	HR63	—	
87HAN6F*	49EB87JF362408	14HP32A*81	HFB63	HBB63	HR63	—	
87HAN60*	49EB87JM362408	14HP32A*81	MCS620R	FCK620	SSRK34	—	
87IAP6F*	49EB87JM362408	14IP32A*81	MCS620R	FCK620	SSRK34	—	
87JAR6F*	49EB87JM362408	14JG32A*81	MCS620R	FCK620	SSRK34	—	
87DAE6L*	49EB87GF242008	14DP32A*81	HFB21	HBB21	HR21	—	
87DAE6P*	49EB87GF242008	14DP32A*81	HFB22	HBB22	HR612	—	
87EAG6L*	49EB87GF242008	14EP32A*81	HFB22	HBB22	HR612	—	
87FAJ6L*	49EB87GF242008	14FP32A*81	HFB22	HBB22	HR612	—	
87FAJ6P*	49EB87GF242008	14FP32A*81	HFB63	HBB63	HR63	—	
87GAL6L*	49EB87GF242008	14GP32A*81	HFB63	HBB63	HR63	—	
87HAN6L*	49EB87JF362408	14HP32A*81	HFB63	HBB63	HR63	—	
87HAN6P*	49EB87JM362408	14HP32A*81	MCS620R	FCK620	SSRK34	—	
87IAP6L*	49EB87JM362408	14IP32A*81	MCS620R	FCK620	SSRK34	—	
87JAR6L*	49EB87JM362408	14JG32A*81	MCS620R	FCK620	SSRK34	—	
87DAA6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A003	
87DAB6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A010	
87DAD6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A025	
87DAE6M*	49EB87GB242008	14DP32A*81	—	—	—	ED63A030	
87EAF6M*	49EB87GB242008	14EP32A*81	—	—	—	ED63A040	
87EAG6M*	49EB87GB242008	14EP32A*81	—	—	—	ED63A050	
87FAH6M*	49EB87GB242008	14FP32A*81	—	—	—	ED63A040	
87FAJ6M*	49EB87GB242008	14FP32A*81	—	—	—	ED63A050	
87GAK6M*	49EB87GB242008	14GP32A*81	—	—	—	ED63A050	
87GAL6M*	49EB87GB242008	14GP32A*81	—	—	—	ED63A100	
87HAN6M*	49EB87IB362408	14HP32A*81	—	—	—	ED63A100	
87IAP6M*	49EB87IB362408	14IP32A*81	—	—	—	ED63A125	
87JAR6M*	49EB87JB362408	14JG32A*81	—	—	—	FXD63A150L	

① Dual voltage coils not available in size 5-8 starters.

② For NO/NC SPDT contact on overload, replace "81" with "91". "81" will give a NC contact.

Ordering Information

- All modifications will consist of Siemens standard components as available. Standard equipment dimensions and enclosure construction may not apply when certain modifications and special features are added.

Pilot Devices

Description	Modification	Class	Enclosure Type	Modification Code	List Price \$
Push Buttons	Start, Stop	14, 17, 18, 36, 37, 40, 83, 84, CLM, CM, LC, LE	All	A1	⑤
	Forward, Reverse, Stop	22, 25, 26, 43	All	A2	
	High, Low, Stop	30, 32	All		
	E-Stop	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43	All	ES	
Selector Switches	Hand-Off-Auto	14, 17, 18, 36, 37, 40, 83, 84, LC, LE	All	A3	⑤
		CM, CLM	All	A3	
	For 24 volt HOA control, 20 Amp contactor only	CM, CLM	1	EM	
	Off-On	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, CLM, CM, LC, LE	All	A4	⑤
	Auto-Off	14, 17, 18, 40, 83, 84, CM, CLM, LC, LE	All	A6	⑤
	Forward-Off-Reverse	22, 25, 26, 43	All	A5	
	High-Off-Low	30, 32	All		
	Hand-Off-Auto (Keyed)	14, 17, 18, 36, 37, 40, 83, 84, LC, LE, CLM, CM	All	A9	⑤
	Auto-Off-Low-High	30, 32	All	A0	

Pilot Lights

Class	Enclosure Type	Lens Color →	Red	Green	Red	Green	Red	Green	Amber	White	Red Push-To-Test	Green Push-To-Test	Green Push-To-Test	LED Bulb Upgrade
		Legend→	On For/Rev Low/High	On For/Rev Low/High	Run	Run	Off	Off	OL Tripped	Control Power On	On For/Rev Low/High	On For/Rev Low/High	Off	
		Mod Code →	FA	FB	FC	FD	FJ	FK	FL ^④	FW	FS	FT	FU	FE ^①
14, 40, 17, 18, 36, 37, 87, 88, LC, LE, CLM, CM	All													
22, 25, 26, 30, 32, 43, 83, 84	All				⑤	⑤								

Coil Options

Class 14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 ^⑤ , 84 ^⑤ , 87, 88					
Volts 60 HZ	Volts 50 HZ	Coil Letter Change	Controller Size — List Price \$		
			00–2½	3, 3½	4
24 120 110–120/220–240 200–208 220–240 277 220–240/440–480 440–480 575–600	24 110 110/190–220 — 190–220 240 190–220/380–440 380–440 550	J F A D G L C H E			
DC Coil ^③	24V 48V 125V 250V	S ^② U V W			

AC (50–60 HZ) or DC	Coil Letter Change	Controller Size 4 (Vacuum Only) Size 5 & 6 (ALL)
23–26V 42–48V 110–127V 200–220V 220–240V 240–277V 380–420V 440–480V 575–600V	J U F D G L K H E	

① Pilot lights are transformer type as standard. For LED type bulbs, order suffix FE in addition to the standard device suffix(es). For example, to order red “ON” and green “OFF” pilot lights with LED bulbs, order FA, FK and FE.

② DC coils include 1 NC, late break aux. contact. This aux. contact takes up one side of the starter (00–4 only).

③ Price x 2 for Classes 22, 25, 26, 30, 32, 43, 83, 84.

④ Bimetal OL - Size 00 - 2 1/2 available. Solid-state OL - Size 00 - 4, 7 & 8 available.

⑤ For Class 83, 84 two devices are provided. Price x 2.

⑥ For Class 83, 84 standard enclosure (92) alternating relay available in 24V or 120V control only.

⑦ S coil is not available for size 4 contactors or starters.

⑧ Class 83 and 84 only.

Factory Modifications

Selection

Ordering Information	Transformer Table		
► Replace (*) with letter from Transformer Table.	Primary Volts	Secondary Volts	Letter
	120	24	B
	208	24	S
	208	120	T
	240	24	J
	240	120	F
	277	24	N
	277	120	P
	380	110	U
	415	100	W
	480	240	R
	480/240	24	D
	480/240	120	A
	600	24	E
	600	120	C

Control Power Transformers^②

Description	Modification Code	Product Class	Enclosure Type	20–60	100	—	200	300–400	—	—	← Lighting & Heating Ratings (Amps)
				0–2½	3	3½, 4	5	6	7	8	
Standard Capacity ^③ with 1-Secondary Fuse	B*	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 ^④ , 84 ^④ , 87, LE	1, 3, 4, 12		—	—	—	—	—	—	← Motor Controller Size
			7 & 9		—	—	—	—	—	—	
Standard Capacity with 2-Primary and 1-Secondary Fuse	D*	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 ^④ , 84 ^④ , 87, LC, LE, CLM, CM	1, 3, 4, 12								
			7 & 9								
100VA Extra Capacity with 2-Primary and 1-Secondary Fuse	C*	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 ^④ , 84 ^④ , 87, LC, LE, CLM, CM	1, 3, 4, 12								
			7 & 9								
150VA Extra Capacity with 2-Primary and 1-Secondary Fuse	C*1	14, 17, 18, 22, 25, 26, 30, 32, 40, 43, 83 ^④ , 84 ^④ , 87, LC, LE, CLM, CM	1, 3, 4, 12								
			All						—	—	
		36, 37, 88	All						—	—	

Factory Assembled Fuse Clips—Class 25, 32, 84^④

Fuse Clip Amps	Volts	Modification Code	List Price \$
30	250	10	
30	600	11	
60	250	12	
60	600	13	
100	250	14	
100	600	15	
200	250	16	
200	600	17	
400	250	18	
400	600	19	
600	250	20	
600	600	21	
800	600	23	
1200	600	24	
1600	600	25	

Note: Factory will furnish the same voltage coils as transformer secondary voltage (except with class 36,37).

① The standard control transformer supplied for starter sizes 0 through 2½ will be rated 45VA and have the appropriate secondary fuse. Primary fuses will not be supplied as standard. For primary fuse option select appropriate suffix from table.

② For 24VAC control a minimum of 100VA CPT required.

③ Price x 2 Class 83 and 84.

④ Class 84 Duplex Controllers require two fusible disconnects thus multiply the price adder by two.

Additional Auxiliary Contacts

Class	NO Contacts	NC Contacts	Modification Code	Controller Size — List Price \$			
				00–1 $\frac{3}{4}$	2–4	5–6	7–8
14, 17, 18, 40, 83 ^③ , 84 ^③	—	1	G01			—	—
	—	2	G02			—	—
	1	—	G10			—	—
	1	1	G11			—	—
	1	2	G12			—	—
	2	—	G20			—	—
	2	1	G21			—	—
	2	2	G22			—	—
	2	3	G23			—	—
	3	1	G31			—	—
	3	2	G32			—	—
	3	3	G33		—	—	—
	4	—	G40			—	—
	4	1	G41			—	—
	4	2	G42		—	—	—
	4	4	G44		—	—	—
22, 25, 26, 43 & 30, 32 (2-winding)	5	—	G50			—	—
	5	1	G51		—	—	—
	5	3	G53		—	—	—
	6	—	G60		—	—	—
	6	2	G62		—	—	—
	7	1	G71		—	—	—
	8	—	G80		—	—	—
	—	2	G02 ^①			—	—
30, 32 (1-winding)	2	—	G20 ^①			—	—
	2	2	G22 ^①			—	—
	4	0	G40 ^①			—	—
	4	4	G44 ^①			—	—
	6	2	G62 ^①			—	—
	8	0	G80 ^①			—	—
LE, CLM, CM	0	2	G02 ^①	—		—	—
	2	—	G20 ^①	—		—	—
	2	2	G22 ^①			—	—
	4	—	G40 ^①			—	—
	4	4	G44 ^①	—		—	—
	6	2	G62 ^①	—		—	—
LC	8	—	G80 ^①	—		—	—
	1	1	G11		—	—	—
	0	1	G01				
	1	0	G10				
	1	1	G11				
	0	2	G02				
LE, CLM, CM	2	0	G20				
	0	2	G02 ^①		—	—	—
	2	0	G20 ^①		—	—	—
	2	2	G22 ^①		—	—	—

Description	Class	Modification Code	Controller Size - Price Deduction \$					
			0, 1	1 $\frac{3}{4}$ - 2 $\frac{1}{2}$	3	3 $\frac{1}{2}$, 4	5, 6	7, 8
Omit Overload Relay and Reset Button	17, 18, 25, 26	EX1						

① Auxiliary contacts will be added evenly across contactors. (i.e. Class 22, G02 suffix will add 2 NC contacts (one per contactor).

② Double the price addition for Class 30 and 32.

③ For class 83 and 84 contacts will be added to both starters. Price x 2.

Factory Modifications

Selection

Control Options


Description	Class	Enclosure Type	Modification Code	List Price \$
Lighting Control Modules (does not include pilot devices)	CLM 20 Amp only	All	2W (2-wire control module) 3W (3-wire control module) 3WS (Start/Stop control module)	
Surge Suppression for 120V AC Coil ^②	14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 83, 84, 87, 88	All	SS	
Disconnect Switch Interlock 2 NO/2 NC DPDT	17, 25, 32, 37, 84, CM, LE	1, 3, 4, 4X, 12	GY	
Motor Circuit Protector Interlock NO/NC SPDT	18, 26, 32, 37, 84, CM, LE	All	GY	
Lightning Arrestor	All	All	L	
Circuit Breaker Shunt Trip	18, 26, 32, 37, 84, 87, 88, CM, LE	All	L6	
Circuit Breaker Undervoltage Trip	18, 26, 32, 37, 84, 87, 88, CM, LE	All	L7	
Circuit Breaker Alarm Switch Trip	18, 26, 32, 37, 84, 87, 88, CM, LE	All	L8	
Ground Lug – 1 Conductor	All	All	L10	
Control Circuit Fuse and Holder (Transformer Primary Fusing)	All	All	F1 (1 fuse) F2 (2 fuses)	
Control Circuit Circuit Breaker Internally Operated	All	All	F4	
Space Heater (120V separate control)	All	All	SH	
Space Heater with Thermostat (120V separate control)	All	All	ST	
Surge Capacitor	87, 88	All	SC	
Alarm Package (includes horn, light, relay & push-button)	83, 84, 87, 88	All	M7	
Backspin Protection	87, 88	All	T5	
Minimum Run Timer 0.2 sec. - 3 mins.	87, 88	All	T6	
Blown Control Fuse Indicator Light	17, 25, 32, 37, 84, 87, 88, CM, LC, LE	All	L11	
Single Phase 120VAC Combination Starter	17, 18, 25, 26	All	SP1	
Single Phase 240VAC Combination Starter	17, 18, 25, 26	All	SP2	

Reversing Options

Description	Class	Modification Code	Controller Size —List Price \$								
			0	1	1¾	2	2½	3	3½	4	5
Reversing in one speed only 2 speed 1 winding	30, 32	R6									—
Reversing in one speed only 2 speed 2 winding		R7									—
Reversing in both speeds 2 speed 1 winding		R8									—
Reversing in both speeds 2 speed 2 winding		R9									—
Reversing for Reduced Voltage	36, 37	R									

Motor Management with PROFIBUS DP Communications^③

Description	Class	Enclosure Type	Modification Code	List Price
SIMOCODE pro C With 0.3-3A Current Module	14, 17, 18, 22, 25, 26	All	MC1	
SIMOCODE pro C With 2.4-25A Current Module			MC2	
SIMOCODE pro C With 10-100A Current Module			MC3	
SIMOCODE pro C With 20-200A Current Module			MC4	
SIMOCODE pro C With 63-630A Current Module			MC5	
SIMOCODE pro V With 0.3-3A Current/Voltage Module			MV1	
SIMOCODE pro V With 2.4-25A Current/Voltage Module			MV2	
SIMOCODE pro V With 10-100A Current/Voltage Module			MV3	
SIMOCODE pro V With 20-200A Current/Voltage Module			MV4	
SIMOCODE pro V With 63-630A Current/Voltage Module			MV5	
Factory Parameterization of SIMOCODE			MM0	

Electrically Held to Mechanically Held Conversion Modules	Class	Enclosure type	Contactor Size (Amp)	Description	Modification Code
	LC	Open, 1, 12, 4/4X	30	2-wire, 24VAC 2-wire, 110-120VAC 2-wire, 200-277VAC 3-wire, 24VAC 3-wire, 110-120VAC 3-wire, 200-277VAC	2W1 2W2 2W3 3W1 3W2 3W3

① Supplied as NEMA 12, field convertible to NEMA 3R.
② Surge Suppression for NEMA sizes 5 – 8 are supplied internal with the coil.

③ A CPT must also be ordered to power the motor management device. Motor management may be ordered with other product classes as specials.

Control Relays

Description	Class	Enclosure Type	Modification Code	List Price \$
Control Relay 4-Poles Max	All	1, 3, 4, 7, 9, 12	R40	
2 NO/2 NC			R22	
4 NC			R04	
Under/Over Voltage, Phase Failure, Phase Sequence, Phase Unbalance	All	All	R1	
Ground Fault Relay		All	R5	
Electronic On Delay Relay (.15s–100h) 24V/120V		1, 3, 4, 7, 9, 12	T1	
Electronic On Delay Relay (.15s–100h) 24V/240V ^①			T2	
Electronic Off Delay Relay (.15s–100s) 120V			T3	
Electronic Off Delay Relay (.15s–100s) 240V ^①			T4	
24 hour time clock	LC, LE, CLM, CM	All	T7	
24 hour time clock with day omission			T8	
7 day time clock			T9	
Compelling Relay	30, 32	1, 4, 12	A6	
Acceleration Control			A7	
Deceleration Control			A8	

Meters—Mounted on Enclosure

Description	Class	Enclosure Type	Modification Code	List ^② Price \$
Ammeter (includes a C.T. if necessary)	14, 17, 18, 22, 25, 26, 30 ^③ , 32 ^③ , 36, 37, 40, 43, 83, 84, 87, 88	1, 3, 4, 4X, 12	M1	
Ammeter and Switch (3-Phase with 3 C.T.'s)		1, 12	M2	
Voltmeter		1, 3, 4, 4X, 12	M3	
Voltmeter and Switch (3-Phase)		1, 12	M4	
Elapsed Time Meter ^③		1, 3, 4, 4X, 12	M5	

Function Identification Plates

Description	Class	Modification Code	List Price \$
Function identification plate, with marking as specified	All	N1	

Terminal Blocks

Description	Class	Modification Code	List Price \$
3 Point Terminal	All	TC3 ^④	
6 Point Terminal		TC6 ^④	
9 Point Terminal		TC9 ^④	

Special Ratings

Description	Class	Modification Code	List Price \$
Service Entrance Rating	17, 18, 25, 26, 32, 37, 84	N3	

Drawings

Description	Class	Catalog Number	List Price \$
Approval/submittal and as-built drawings for factory modified product may be ordered. The drawing set includes an enclosure outline, a panel layout and a schematic. When entering the order, use the line item notes to reference a product and modifications or an existing order that the drawings are to be engineered for. Specify the contact information and an email address in the ship to address field. Attach any reference drawings to the order or forward to National Customer Support. Once completed, the drawing set will be emailed.	All	CONTROLDRAWING	

① Not available on Class 36, 37.
② Price x 2 Class 83 and 84.

③ ETM available with 120V coil only.
④ For terminal point more than 9 terminals use additional suffixes. Max 3 suffixes can be selected.

⑤ Class 30 and 32 can be modified with only an elapsed time meter. No other meters apply to class 30 or 32.

Overload Relay Heater Tables

Selection of Heater Elements for Overload Relays

General

Use only when motor full load current is not known. Motor amps will vary depending on the type and manufacturer of the motor. These average values, for motors with service factor of 1.15, are to be used only as a guide. The formulas at the bottom of the page may be used to obtain approximate amps for other motors.

Note: RPM shown for 60 cycle motors. For 50 cycle motors, multiply RPM by .83.

CAUTION: Actual motor amps may be higher or lower than the values listed below for a particular motor. For more reliable motor protection, select heater elements by using the full load motor nameplate amps.

Single Phase motor full load amps of the same horsepower, voltage and speed vary over wide ranges. The following table conforms with table 430.148 of the NEC.

1-Phase

Hp	Full Load Current (60Hz)	
	115 Volts	230 Volts
1/8	4.4	2.2
1/4	5.8	2.9
1/2	7.2	3.6
3/4	9.8	4.9
1	13.8	6.9
1 1/2	16	8
2	20	10
3	24	12
5	34	17
7 1/2	56	28
10	80	40
10	100	50

3-Phase

Hp	Syn Speed RPM	Full Load Current (60Hz)				50 Hz
		200 Volts	230 Volts	460 Volts	575 Volts	
1/4	1800	1.09	0.95	0.48	0.38	0.55
	1200	1.61	1.40	0.70	0.56	0.81
	900	1.84	1.60	0.80	0.64	0.93
1/2	1800	1.37	1.19	0.60	0.48	0.64
	1200	1.83	1.59	0.80	0.64	0.92
	900	2.07	1.80	0.90	0.72	1.04
3/4	1800	1.98	1.72	0.86	0.69	0.99
	1200	2.47	2.15	1.08	0.86	1.24
	900	2.74	2.38	1.19	0.95	1.38
1	1800	2.83	2.46	1.23	0.98	1.42
	1200	3.36	2.82	1.46	1.17	—
	900	3.75	3.26	1.63	1.30	1.88
1 1/2	3600	3.22	2.80	1.40	1.12	1.70
	1800	4.09	3.56	1.78	1.42	2.06
	1200	4.32	3.76	1.88	1.50	2.28
2	3600	4.95	4.30	2.15	1.72	2.60
	1800	5.01	4.36	2.18	1.74	2.69
	1200	5.59	4.86	2.43	1.94	2.94
3	3600	6.07	5.28	2.64	2.11	3.20
	1800	6.44	5.60	2.80	2.24	3.39
	1200	6.44	5.60	2.80	2.24	3.39
4	3600	7.36	6.40	3.20	2.56	3.84
	1800	7.87	6.84	3.42	2.74	4.14
	1200	9.09	7.90	3.95	3.16	4.77
5	3600	9.59	8.34	4.17	3.34	5.02
	1800	10.8	9.40	4.70	3.76	5.70
	1200	11.7	10.2	5.12	4.10	6.20
7 1/2	3600	13.1	11.4	5.70	4.55	6.80
	1800	15.5	13.5	5.76	5.41	8.20
	1200	16.6	14.4	7.21	5.78	8.74
10	3600	18.2	15.8	7.91	6.32	9.59
	1800	18.3	15.9	7.92	6.33	9.60
	1200	22.4	19.5	9.79	7.81	11.50
15	3600	24.7	21.5	10.7	8.55	13.00
	1800	25.1	21.8	10.9	8.70	13.20
	1200	26.5	23.0	11.5	9.19	13.90
20	3600	29.2	25.4	12.7	10.1	15.40
	1800	30.8	25.8	13.4	10.7	16.30
	1200	32.2	28.0	14.0	11.2	16.90
25	3600	35.1	30.5	15.2	12.2	18.50
	1800	41.9	36.4	18.2	14.5	22.00
	1200	45.1	39.2	19.6	15.7	23.70
30	3600	47.6	41.4	20.7	16.5	25.00
	1800	51.2	44.5	22.2	17.8	26.90
	1200	58.0	50.4	25.2	20.1	30.50
40	3600	58.9	51.2	25.6	20.5	31.00
	1800	60.7	52.8	26.4	21.1	31.90
	1200	63.1	54.9	27.4	21.9	33.20

3-Phase

Hp	Syn Speed RPM	Full Load Current (60Hz)				50 Hz
		200 Volts	230 Volts	460 Volts	575 Volts	
25	3600	69.9	60.8	30.4	24.3	36.80
	1800	74.5	64.8	32.4	25.9	39.20
	1200	75.4	65.6	32.8	26.2	39.60
30	3600	77.4	67.3	33.7	27.0	40.70
	1800	84.8	73.7	36.8	29.4	—
	1200	86.9	75.6	37.8	30.2	45.70
40	3600	90.6	78.8	39.4	31.5	47.60
	1800	94.1	81.8	40.9	32.7	49.50
	1200	111	96.4	48.2	38.5	—
50	3600	116	101	50.4	40.3	61.00
	1800	117	102	50.6	40.4	61.20
	1200	121	105	52.2	41.7	63.20
60	3600	138	120	60.1	48.2	—
	1800	143	124	62.2	49.7	75.20
	1200	145	126	63.0	50.4	76.20
75	3600	150	130	65.0	52.0	78.50
	1800	164	143	71.7	57.3	—
	1200	171	149	74.5	59.4	90.00
100	3600	173	150	75.0	60.0	91.10
	1800	177	154	77.0	61.5	93.10
	1200	206	179	89.6	71.7	—
125	3600	210	183	91.6	73.2	111.00
	1800	212	184	92.0	73.5	112.00
	1200	222	193	96.5	77.5	117.00
150	3600	266	231	115	92.2	—
	1800	271	236	118	94.8	144.00
	1200	275	239	120	95.6	145.00
200	3600	290	252	126	101	153.00
	1800	—	292	146	116	—
	1200	—	293	147	117	177.00
250	3600	—	298	149	119	180.00
	1800	—	305	153	122	186.00
	1200	—	343	171	137	—
300	3600	—	348	174	139	210.00
	1800	—	350	174	139	210.00
	1200	—	365	183	146	211.00
400	3600	—	458	229	184	—
	1800	—	452	226	181	274.00
	1200	—	460	230	184	276.00
500	3600	—	482	241	193	279.00
	1800	—	559	279	223	—
	1200	—	568	284	227	343.00
600	3600	—	573	287	229	345.00
	1800	—	600	300	240	347.00
	1200	—	278	339	271	392.00
800	3600	—	684	342	274	395.00
	1800	—	896	448	358	—

Formula—Approximate Full Load Amps for Other Motors

208 Volt Full Load Amp \approx 230 Volt current \times 110%

2-Phase FLA \approx 0.866 \times the 3-Phase FLA

2-Phase, 3-wire current in common wire \approx 1.41 \times that in the other 2 lines

25Hz 1500 RPM, amps \approx amps of 60Hz, 3600 RPM

25Hz 750 RPM, amps \approx amps of 60Hz, 1800 RPM

Service factor 1.0 \approx amps \times 0.9

50°C–55°C motor \approx amps \times 0.9

Overload Relay Heater Tables

Selection of Heater Elements for Overload Relays

General

To Select Heater Catalog Number Use

- Product Class
- Controller Size
- Motor Amp
- Phase

Catalog No 14 C P 3 2 B C 81



- Find heater table number below, using the Product Class, Controller Size and Phase. Heater table number is found in the column under the type of overload and phase.

- Refer to the specified table and use the controller size and motor amps to select the heater catalog number.

a. If motor amps are not known, an approximate value may be found on the previous page. These values should be used with caution and only when motor amps are not available.

Heaters shown on the following pages provide a maximum trip rating of 125% of minimum motor amperes for 40°C motors (service factor 1.15). For other motors (service factor 1.0), select the next lower listed heater catalog number within the designated table which provides a maximum trip rating of approximately 115%.

Overload relays do not provide protection against short circuits. To ensure proper coordination with short circuit protective device, select heaters from the information packaged with the control device.

Class	Description	Size or Amperage	Controller Size Letter	Heater Table Number			
				Bimetal Standard Trip (Class 20)		Bimetal Quick Trip (Class 10)	
				Compensated E Heaters Green Reset		Compensated K Heaters Green Reset	
				1Ph	3Ph	1Ph	3Ph
SMF	Manual	All	—	See Page 9/126			
	Magnetic						
14, 22	Non-reversing, Reversing	00-4	B-J	213	233	313	332
17, 18 25, 26 30, 32 ^① 83, 84 87, 89	Combination Reversing Combination Multi Speed Pump Controllers Motor Control Centers	0-4	C-J	—	233	—	332
48	Panel Mounted Overload Relay	25-180A	D-J	216	238	316	335

ESP200 starters do not require heater elements.

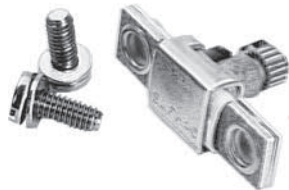
① Overload Relay Selection Multi-Speed

Each speed requires a separate set of overloads. The adjustment range must be selected on the basis of the full-load current for each particular speed.

Manual Control

Heater Elements, Class SMF

General



Heater Elements Class SMF

Ordering Information

- Determine number of heater elements required from Table A.
- Determine motor full load current and service factor.
NOTE: If motor amps are unknown, an approximate value may be found on page 9/124. These values should be used with caution and only when motor amps are not available.
- If the motor and controller are in the same ambient temperature:
 - For 1.15 to 1.25 service factor motors use 100% of motor full load current for heater element selection.
 - For 1.0 service factor motors use 90% of motor full load current for heater element selection.
 - Heater elements are class 20.
- If the motor and controller are in different ambient temperatures multiply motor full load current by the multiplier in Table B. Use the resultant full load current for heater element selection.
- Select proper heater element from table below.
- All tables are based on the operation of the motor and controller in the same ambient temperature, 40°C (104°F) or less. Always be certain the correct heater element is installed in the starter before operating the motor.

Heater Catalog Number	Motor Full-Load Current (Amps)	List Price \$
SMFH01	0.157–0.173	
SMFH02	0.174–0.192	
SMFH03	0.193–0.212	
SMFH04	0.213–0.235	
SMFH05	0.236–0.261	
SMFH06	0.262–0.289	
SMFH07	0.290–0.321	
SMFH08	0.322–0.355	
SMFH09	0.356–0.399	
SMFH10	0.41–0.44	
SMFH11	0.45–0.49	
SMFH12	0.50–0.53	
SMFH13	0.54–0.58	
SMFH14	0.59–0.65	
SMFH15	0.66–0.71	
SMFH16	0.72–0.78	
SMFH17	0.79–0.85	
SMFH18	0.86–0.96	
SMFH19	0.97–1.04	
SMFH20	1.05–1.16	
SMFH21	1.17–1.25	
SMFH22	1.30–1.39	
SMFH23	1.38–1.54	
SMFH24	1.48–1.63	
SMFH25	1.57–1.75	
SMFH26	1.66–1.86	

Heater Catalog Number	Motor Full-Load Current (Amps)	List Price \$
SMFH27	1.80–1.99	
SMFH28	1.96–2.15	
SMFH29	2.16–2.38	
SMFH30	2.39–2.75	
SMFH31	2.76–2.84	
SMFH32	2.85–3.06	
SMFH33	3.07–3.45	
SMFH34	3.46–3.70	
SMFH35	3.71–4.07	
SMFH36	4.08–4.32	
SMFH37	4.33–4.90	
SMFH38	4.91–5.35	
SMFH39	5.36–5.85	
SMFH40	5.86–6.41	
SMFH41	6.42–6.79	
SMFH42	6.80–7.57	
SMFH43	7.58–8.15	
SMFH44	8.16–8.98	
SMFH45	8.99–9.67	
SMFH46	9.68–9.95	
SMFH47	9.96–10.8	
SMFH48	10.9–12.1	
SMFH49	12.2–13.1	
SMFH50	13.2–13.9	
SMFH51	14.0–15.0	
SMFH52	15.1–16.0	

Table A
Number of Heater Elements

Device	Number of Heater Elements	Notes
SMFF*1 SMFF*2 SMFF*3 SMFF*4 SMFF*5 SMFF*6	1	All single pole and two pole SMF starters require only 1 Heater Element.
SMFF*22 SMFF*44	2	Duplex Unit. One Heater Element per starter.
SMFF*11 SMFF*22	2	Two Speed Starter. One Heater Element per speed.

Table B—Special Applications
Heater Element Selection

Continuous Duty Motor Service Factor	Ambient Temperature of Motor		
	Same as Controller Ambient	Constant 10°C (18°F) Higher Than Controller Ambient	Constant 10°C (18°F) Lower Than Controller Ambient
	Full Load Current Multiplier		
1.15 to 1.25	1.0	0.9	1.05
1.0	0.9	0.8	0.95

Overload Relay Heater Tables

Full Load Motor Amps, Single Phase, Trip Class 20 – Tables 213, 216

Selection

1

2

3

4

5

6

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8

9

Table 213 for Class 14, 22 (1-Phase)

Full Load Amps			Heater Catalog No	List Price \$
Size 00, 0, 1	Size 1P	Size 2, 2½		
0.37–0.40	—	—	E3	
0.41–0.44	0.41–0.44	—	E4	
0.45–0.47	0.45–0.47	—	E5	
0.48–0.52	0.48–0.52	—	E6	
0.53–0.57	0.53–0.57	—	E7	
0.58–0.62	0.58–0.62	—	E8	
0.63–0.69	0.63–0.69	—	E9	
0.70–0.74	0.70–0.74	—	E11	
0.75–0.81	0.75–0.81	—	E12	
0.82–0.85	0.82–0.85	—	E13	
0.86–0.93	0.86–0.93	—	E14	
0.94–1.03	0.94–1.03	—	E16	
1.04–1.11	1.04–1.11	—	E17	
1.12–1.22	1.12–1.22	—	E18	
1.23–1.34	1.23–1.34	—	E23	
1.35–1.53	1.35–1.53	—	E24	
1.54–1.71	1.54–1.71	—	E26	
1.72–1.92	1.72–1.92	—	E27	
1.93–2.12	1.93–2.12	—	E28	
2.13–2.24	2.13–2.24	—	E29	
2.25–2.43	2.25–2.43	—	E31	
2.44–2.57	2.44–2.57	—	E32	
2.58–2.86	2.58–2.86	—	E33	
2.87–3.16	2.87–3.16	—	E34	
3.17–3.35	3.17–3.35	—	E36	
3.36–3.58	3.36–3.58	—	E37	
3.59–3.90	3.59–3.90	—	E38	
3.91–4.25	3.91–4.25	—	E39	
4.26–4.77	4.26–4.77	—	E41	
4.78–5.35	4.78–5.35	—	E42	
5.36–5.76	5.36–5.76	—	E44	
5.77–6.33	5.77–6.33	—	E46	
6.34–6.98	6.34–6.98	—	E47	
6.99–7.37	6.99–7.37	—	E48	
7.38–7.71	7.38–7.71	—	E49	
7.72–8.51	7.72–8.51	—	E50	
8.52–9.31	8.52–9.31	—	E51	
9.32–10.1	9.32–10.1	—	E52	
10.2–10.9	10.2–10.9	—	E53	
11.0–12.2	11.0–12.2	—	E54	
12.3–13.5	12.3–13.5	—	E55	
13.6–15.7	13.6–15.7	—	E56	
15.8–17.3	15.8–17.3	19.4–22.0	E57	
17.4–19.9	17.4–19.9	22.1–23.5	E60	
20.0–21.7	20.0–21.7	23.6–25.0	E61	
21.8–23.4	21.8–23.4	25.1–27.0	E62	
23.5–24.0	23.5–23.7	27.1–28.9	E65	
—	23.8–25.1	29.0–31.0	E66	
—	25.2–27.9	31.1–34.8	E67	
—	28.0–32.2	34.9–36.9	E69	
—	32.3–34.0	37.0–43.9	E70	
—	—	44.0–46.0	E72	
—	—	46.1–48.3	E73	
—	—	48.4–55.0	E74	
—	—	55.1–60.0	E76	

Table 216 for Class 48

Full Load Amps			Heater Catalog No	List Price \$
48DA, 48GA	48HA	48JA		
0.34–0.36	—	—	E3	
0.37–0.40	—	—	E4	
0.41–0.43	—	—	E5	
0.44–0.47	—	—	E6	
0.48–0.51	—	—	E7	
0.52–0.56	—	—	E8	
0.57–0.62	—	—	E9	
0.63–0.67	—	—	E11	
0.68–0.73	—	—	E12	
0.74–0.77	—	—	E13	
0.78–0.84	—	—	E14	
0.85–0.93	—	—	E16	
0.94–1.00	—	—	E17	
1.01–1.10	—	—	E18	
—	—	—	E19	
1.11–1.21	—	—	E23	
1.22–1.38	—	—	E24	
1.39–1.54	—	—	E26	
1.55–1.73	—	—	E27	
1.74–1.91	—	—	E28	
1.92–2.02	—	—	E29	
2.03–2.19	—	—	E31	
2.20–2.32	—	—	E32	
2.33–2.58	—	—	E33	
2.59–2.85	—	—	E34	
2.86–3.02	—	—	E36	
3.03–3.23	—	—	E37	
3.24–3.52	—	—	E38	
3.53–3.83	—	—	E39	
3.84–4.30	—	—	E41	
4.31–4.82	—	—	E42	
4.83–5.19	—	—	E44	
5.20–5.71	—	—	E46	
5.72–6.29	—	—	E47	
6.30–6.64	—	—	E48	
6.65–6.95	—	—	E49	
6.96–7.67	—	—	E50	
7.68–8.39	—	—	E51	
8.40–9.19	—	—	E52	
9.20–9.94	—	—	E53	
9.95–10.9	—	—	E54	
11.0–12.2	—	—	E55	
12.3–14.2	—	—	E56	
14.3–15.6	—	—	E57	
—	—	—	E59	
15.7–17.9	—	—	E60	
18.0–19.6	—	—	E61	
19.7–22.3	—	—	E62	
22.4–24.0	—	—	E65	
24.1–25.9	—	—	E66	
26.0–29.5	27.1–30.0	—	E67	
29.6–32.5	30.1–33.2	—	E69	
32.6–33.5	33.3–35.7	—	E70	
33.6–36.9	35.8–39.4	—	E71	
37.0–39.2	39.5–43.4	—	E72	
39.3–43.1	43.5–46.9	—	E73	
43.2–47.4	47.0–51.5	—	E74	
47.5–50.0	51.6–57.0	—	E76	
50.1–55.2	57.1–62.8	—	E77	
55.3–60.0	62.9–69.1	—	E78	
—	69.2–75.0	—	E79	
—	75.1–83.3	—	E80	
—	—	50.0–55.9	E88	
—	—	56.0–60.9	E89	
—	—	61.0–65.9	E91	
—	—	66.0–69.9	E92	
—	—	70.0–75.9	E93	
—	—	76.0–81.9	E94	
—	83.4–86.9	82.0–86.9	E96	
—	87.0–92.9	87.0–92.9	E97	
—	93.0–100.0	93.0–97.9	E98	
—	—	98.0–107.9	E99	
—	—	108.0–113.9	E101	
—	—	114.0–125.0	E102	
—	—	126.0–138.0	E103	
—	—	139.0–153.0	E104	
—	—	154.0–163.0	E106	
—	—	164.0–180.0	E107	

Overload Relay Heater Tables

Full Load Motor Amps, 3-Phase, Trip Class 20 – Tables 233, 238

Selection

Table 233 for Class 14, 17, 18, 22, 25, 26, 30, 32, 83, 84, 87 (3-Phase)

Full Load Amps					Heater Catalog No	List Price \$
Size 00, 0, 1	Size 1 1/4	Size 2, 2 1/2	Size 3, 3 1/2	Size 4		
0.38–0.40	—	—	—	—	E6	
0.41–0.43	—	—	—	—	E7	
0.44–0.48	—	—	—	—	E8	
0.49–0.53	—	—	—	—	E9	
0.54–0.57	—	—	—	—	E11	
0.58–0.62	—	—	—	—	E12	
0.63–0.66	—	—	—	—	E13	
0.67–0.72	—	—	—	—	E14	
0.73–0.80	—	—	—	—	E16	
0.81–0.85	—	—	—	—	E17	
0.86–0.92	—	—	—	—	E18	
0.93–0.99	—	—	—	—	E19	
1.00–1.08	—	—	—	—	E23	
1.09–1.23	—	—	—	—	E24	
1.24–1.37	—	—	—	—	E26	
1.38–1.54	—	—	—	—	E27	
1.55–1.69	—	—	—	—	E28	
1.70–1.80	—	—	—	—	E29	
1.81–1.94	—	—	—	—	E31	
1.95–2.07	—	—	—	—	E32	
2.08–2.26	—	—	—	—	E33	
2.27–2.54	2.27–2.54	—	—	—	E34	
2.55–2.69	2.55–2.69	—	—	—	E36	
2.70–2.88	2.70–2.88	—	—	—	E37	
2.89–3.14	2.89–3.14	—	—	—	E38	
3.15–3.40	3.15–3.40	—	—	—	E39	
3.41–3.81	3.41–3.81	—	—	—	E41	
3.82–4.26	3.82–4.25	—	—	—	E42	
4.27–4.62	4.26–4.62	—	—	—	E44	
4.63–5.09	4.63–5.09	—	—	—	E46	
5.10–5.61	5.10–5.61	—	—	—	E47	
5.62–5.91	5.62–5.91	—	—	—	E48	
5.92–6.15	5.92–6.15	—	—	—	E49	
6.16–6.70	6.16–6.70	—	—	—	E50	
6.71–7.54	6.71–7.54	—	—	—	E51	
7.55–8.29	7.55–8.29	—	—	—	E52	
8.30–8.99	8.30–8.99	—	—	—	E53	
9.00–9.85	9.00–9.85	—	—	—	E54	
9.86–10.4	9.86–10.4	—	—	—	E55	
10.5–12.0	10.5–12.0	10.5–12.0	—	—	E56	
12.1–13.6	12.1–13.6	12.1–13.6	—	—	E57	
13.7–15.6	13.7–15.6	13.7–15.6	—	—	E60	
15.7–17.0	15.7–17.0	15.7–17.1	—	—	E61	
17.1–18.4	17.1–19.4	17.2–19.4	—	—	E62	
18.5–19.4	19.5–20.9	19.5–20.9	—	—	E65	
19.5–21.3	21.0–22.2	21.0–22.2	—	—	E66	
21.4–24.4	22.3–25.3	22.3–25.3	—	—	E67	
24.5–25.9	25.4–26.9	25.4–26.9	30.0–33.5	—	E69	
26.0–27.0	27.0–30.2	27.0–30.2	33.6–36.4	—	E70	
—	—	—	36.5–39.6	—	E71	
—	30.3–33.3	30.3–33.3	—	—	E72	
—	33.4–36.0	33.4–35.3	39.7–43.6	—	E73	
—	—	—	43.7–46.5	—	E73A	
—	—	35.4–41.5	46.6–51.6	—	E74	
—	—	41.6–45.0	51.7–54.4	—	E76	
—	—	45.1–52.3	54.5–58.0	—	E77	
—	—	52.4–55.7	58.1–63.0	—	E78	
—	—	55.8–60.0	63.1–67.7	—	E79	
—	—	—	67.8–72.4	—	E80	
—	—	—	—	—	E88	
—	—	—	—	56.9–60.9	E89	
—	—	—	—	61.0–63.9	E91	
—	—	—	—	64.0–67.7	E92	
—	—	—	—	67.8–72.4	E93	
—	—	—	72.5–77.7	—	E94	
—	—	—	80.1–88.1	77.8–85.9	E96	
—	—	—	88.2–91.5	86.0–91.9	E97	
—	—	—	91.6–96.8	92.0–96.7	E98	
—	—	—	96.9–99.0	96.8–105	E99	
—	—	—	99.1–108.0	—	E101	
—	—	—	—	—	E102	
—	—	—	—	106–115	E103	
—	—	—	—	116–130	E104	

Table 238 for Class 48

Full Load Amps				Heater Catalog No	List Price \$
48DC	48GC	48HA	48JA		
0.30–0.32	—	—	—	E3	
0.33–0.35	—	—	—	E4	
0.36–0.38	—	—	—	E5	
0.39–0.41	—	—	—	E6	
0.42–0.44	—	—	—	E7	
0.45–0.49	—	—	—	E8	
0.50–0.54	—	—	—	E9	
0.55–0.58	—	—	—	E11	
0.59–0.63	—	—	—	E12	
0.64–0.67	—	—	—	E13	
0.68–0.73	—	—	—	E14	
0.74–0.81	—	—	—	E16	
0.82–0.87	—	—	—	E17	
0.88–0.94	—	—	—	E18	
0.95–1.00	—	—	—	E19	
1.01–1.10	—	—	—	E23	
1.11–1.26	—	—	—	E24	
1.27–1.40	—	—	—	E26	
1.41–1.58	—	—	—	E27	
1.59–1.74	—	—	—	E28	
1.75–1.85	—	—	—	E29	
1.86–1.99	—	—	—	E31	
2.00–2.11	—	—	—	E32	
2.12–2.31	—	—	—	E33	
2.32–2.59	—	—	—	E34	
2.60–2.75	—	—	—	E36	
2.76–2.95	—	—	—	E37	
2.96–3.21	—	—	—	E38	
3.22–3.48	—	—	—	E39	
3.49–3.89	—	—	—	E41	
3.90–4.35	—	—	—	E42	
4.36–4.73	—	—	—	E44	
4.74–5.21	—	—	—	E46	
5.22–5.74	—	—	—	E47	
5.75–6.05	—	—	—	E48	
6.06–6.46	—	—	—	E49	
6.47–6.95	—	—	—	E50	
6.96–8.09	—	—	—	E51	
8.10–9.29	—	—	—	E52	
9.30–10.4	—	—	—	E53	
—	—	—	—	E54	
10.5–10.9	—	—	—	E55	
11.0–12.0	—	—	—	E56	
12.1–14.5	—	—	—	E57	
14.6–16.8	—	—	—	E60	
16.9–18.4	16.9–18.4	—	—	E61	
18.5–20.9	18.5–20.9	—	—	E62	
21.0–22.5	21.0–22.5	—	—	E65	
22.6–24.3	22.6–24.7	—	—	E66	
24.4–27.2	24.8–27.2	27.1–30.0	—	E67	
27.3–29.2	27.3–29.2	30.1–33.2	—	E69	
29.3–30.0	29.3–32.0	33.3–35.7	—	E70	
—	32.1–34.9	35.8–39.4	—	E71	
—	—	39.5–43.4	—	E72	
—	35.0–37.8	43.5–46.9	—	E73	
—	37.9–41.7	—	—	E73A	
—	41.8–45.9	47.0–51.5	—	E74	
—	46.0–49.0	51.6–57.0	—	E76	
—	49.1–54.2	57.1–62.8	—	E77	
—	54.3–60.0	62.9–69.1	—	E78	
—	—	69.2–75.0	—	E79	
—	—	75.1–83.3	—	E80	
—	—	—	50.0–55.9	E88	
—	—	—	56.0–60.9	E89	
—	—	—	61.0–65.9	E91	
—	—	—	66.0–69.9	E92	
—	—	—	70.0–75.9	E93	
—	—	—	76.0–81.9	E94	
—	—	83.4–86.9	82.0–86.9	E96	
—	—	87.0–92.9	87.0–92.9	E97	
—	—	93.0–100.0	93.0–97.9	E98	
—	—	—	98.0–107.9	E99	
—	—	—	108–113.9	E101	
—	—	—	114–125.9	E102	
—	—	—	126–138.9	E103	
—	—	—	139–153.9	E104	
—	—	—	154–163.9	E106	
—	—	—	164–180.9	E107	

Overload Relay Heater Tables

Full Load Motor Amps, Single Phase, Trip Class 10 – Tables 313, 316

Selection

Table 313 for Class 14, 22 (1-Phase)

Full Load Amps			Heater Catalog No	List Price \$
Size 00, 0, 1	Size 1P	Size 2, 2½		
1.85–2.05	1.85–2.05	—	K21	
2.06–2.35	2.06–2.35	—	K22	
2.36–2.64	2.36–2.64	—	K24	
2.65–2.96	2.65–2.96	—	K27	
2.97–3.31	2.97–3.31	—	K28	
3.32–3.51	3.32–3.51	—	K29	
3.52–3.87	3.52–3.87	—	K31	
3.88–4.31	3.88–4.31	—	K32	
4.32–4.79	4.32–4.79	—	K33	
4.80–5.21	4.80–5.21	—	K34	
5.22–5.75	5.22–5.75	—	K36	
5.76–6.11	5.76–6.11	—	K37	
6.12–6.95	6.12–6.95	—	K39	
6.96–7.73	6.96–7.73	—	K41	
7.74–8.47	7.74–8.47	—	K42	
8.48–9.52	8.48–9.52	—	K43	
9.53–10.4	9.53–10.4	—	K49	
10.5–11.1	10.5–11.1	—	K50	
11.2–12.4	11.2–12.4	—	K52	
12.5–13.5	12.5–13.5	—	K53	
13.6–15.1	13.6–15.1	—	K54	
15.2–16.6	15.2–16.6	—	K55	
16.7–17.6	16.7–17.6	—	K57	
17.7–18.8	17.7–18.8	18.7–19.7	K58	
18.9–21.6	18.9–21.6	19.8–21.3	K60	
21.7–22.7	21.7–22.7	21.4–22.8	K61	
22.8–25.3	22.8–25.3	22.9–24.2	K62	
—	25.4–26.6	24.3–26.5	K63	
—	26.7–30.1	26.6–29.3	K64	
—	30.2–33.0	29.4–32.0	K67	
—	33.1–34.1	32.1–35.6	K68	
—	—	35.7–37.9	K69	
—	—	38.0–40.3	K70	
—	—	40.4–44.3	K72	
—	—	44.4–49.5	K73	
—	—	49.6–52.1	K74	
—	—	52.2–53.7	K75	
—	—	53.8–60.0	K76	

Table 316 for Class 48

Full Load Amps				Heater Catalog No	List Price \$
48DA	48GA	48HA	48JA		
1.69–1.88	—	—	—	K21	
1.89–2.05	—	—	—	K22	
2.06–2.21	—	—	—	K23	
2.22–2.44	—	—	—	K24	
2.45–2.70	—	—	—	K26	
2.71–2.92	—	—	—	K27	
2.93–3.27	—	—	—	K28	
3.28–3.56	—	—	—	K29	
3.57–3.83	—	—	—	K31	
3.84–4.23	—	—	—	K32	
4.24–4.57	—	—	—	K33	
4.58–4.97	—	—	—	K34	
4.98–5.67	—	—	—	K36	
5.68–6.11	—	—	—	K37	
6.12–6.91	—	—	—	K39	
6.92–7.65	—	—	—	K41	
7.66–8.4	—	—	—	K42	
8.5–8.9	—	—	—	K43	
9.0–10.1	9.12–9.6	—	—	K49	
10.2–11.2	9.7–10.4	—	—	K50	
11.3–12.3	10.5–11.4	—	—	K52	
12.4–13.3	11.5–12.1	—	—	K53	
13.4–14.1	12.2–12.9	—	—	K54	
14.2–15.0	13.0–13.7	—	—	K55	
15.1–16.2	13.8–14.8	—	—	K56	
16.3–17.5	14.9–16.4	—	—	K57	
17.6–18.6	16.5–18.2	—	—	K58	
18.7–19.9	18.3–19.5	—	—	K60	
20.0–21.3	19.6–20.9	—	—	K61	
21.4–22.8	21.0–22.8	23.2–25.1	—	K62	
22.9–25.1	22.9–24.7	25.2–27.3	—	K63	
25.2–27.6	24.8–27.6	27.4–30.4	—	K64	
27.7–30.0	27.7–30.5	30.5–33.3	—	K67	
—	30.6–33.9	33.4–36.5	—	K68	
—	34.0–37.3	36.6–39.3	—	K69	
—	37.4–40.2	39.4–43.5	—	K70	
—	40.3–41.9	43.6–46.6	43.0–46.5	K72	
—	42.0–45.9	46.7–51.1	46.6–50.9	K73	
—	46.0–50.9	51.2–56.3	51.0–55.9	K74	
—	51.0–52.9	56.4–61.1	56.0–59.1	K75	
—	53.0–57.7	61.2–64.9	59.2–68.7	K76	
—	57.8–60.0	65.0–71.9	—	K77	
—	—	72.0–80.7	68.8–80.7	K78	
—	—	80.8–92.7	80.8–92.7	K85	
—	—	92.8–100.0	92.8–103.9	K86	
—	—	—	104.0–113.5	K87	
—	—	—	113.6–127.9	K89	
—	—	—	128.0–143.9	K92	
—	—	—	144.0–163.9	K94	
—	—	—	164.0–180.0	K96	

Overload Relay Heater Tables

Full Load Motor Amps, 3-Phase, Trip Class 10 – Tables 332, 335

Selection

Table 332 for Class 14, 17, 18, 22, 25, 26, 30, 32, 83, 84, 87 (3-Phase)

Full Load Amps					Heater Catalog No	List Price \$
Size 00, 0, 1	Size 1½	Size 2, 2½	Size 3, 3½	Size 4		
1.52–1.65	1.52–1.65	—	—	—	K21	
1.66–1.79	1.66–1.79	—	—	—	K22	
1.80–1.94	1.80–1.94	—	—	—	K23	
1.95–2.15	1.95–2.15	—	—	—	K24	
2.16–2.37	2.16–2.37	—	—	—	K26	
2.38–2.56	2.38–2.56	—	—	—	K27	
2.57–2.87	2.57–2.87	—	—	—	K28	
2.88–3.13	2.88–3.13	—	—	—	K29	
3.14–3.37	3.14–3.37	—	—	—	K31	
3.38–3.72	3.38–3.72	—	—	—	K32	
3.73–4.00	3.73–4.00	—	—	—	K33	
4.01–4.35	4.01–4.35	—	—	—	K34	
4.36–4.99	4.36–4.99	—	—	—	K36	
5.00–5.38	5.00–5.38	—	—	—	K37	
5.39–5.79	5.39–5.79	—	—	—	K39	
5.80–6.43	5.80–6.43	—	—	—	K41	
6.44–6.83	6.44–6.83	—	—	—	K42	
6.84–7.83	6.84–7.83	—	—	—	K43	
7.84–8.23	7.84–8.23	—	—	—	K49	
8.24–9.59	8.24–9.59	—	—	—	K50	
9.60–9.90	9.60–9.90	—	—	—	K52	
10.0–10.7	10.0–10.7	—	—	—	K53	
10.8–11.6	10.8–11.6	12.1–12.7	—	—	K54	
11.7–12.3	11.7–12.3	12.8–13.5	—	—	K55	
12.4–13.4	12.4–13.4	13.6–14.6	—	—	K56	
13.5–14.2	13.5–14.2	14.7–15.9	—	—	K57	
14.3–15.1	14.3–15.1	16.0–16.9	—	—	K58	
15.2–17.5	15.2–17.5	17.0–18.2	—	—	K60	
17.6–18.7	17.6–18.7	18.3–19.5	—	—	K61	
18.8–20.0	18.8–20.0	19.6–20.9	—	—	K62	
20.1–21.5	20.1–21.5	21.0–23.1	—	—	K63	
21.6–23.9	21.6–23.9	23.2–25.4	—	—	K64	
24.0–25.8	24.0–25.8	25.5–27.9	—	—	K67	
—	25.9–29.5	—	—	—	K68	
—	—	28.0–30.5	—	—	K69	
—	29.6–32.7	30.6–33.5	36.8–40.0	—	K70	
—	32.8–36.0	33.6–37.2	40.1–42.4	—	K72	
—	—	37.3–40.7	42.5–46.3	—	K73	
—	—	40.8–43.0	46.4–49.6	—	K74	
—	—	43.1–47.9	49.7–52.3	49.7–52.3	K75	
—	—	48.0–52.7	52.4–57.5	52.4–57.5	K76	
—	—	52.8–58.3	57.6–63.9	57.6–63.0	K77	
—	—	58.4–60.0	64.0–67.9	63.1–68.1	K78	
—	—	—	68.0–74.3	68.2–74.3	K83	
—	—	—	74.4–77.9	74.4–79.9	K85	
—	—	—	78.0–83.1	80.0–87.4	K86	
—	—	—	83.2–91.4	87.5–90.0	K87	
—	—	—	91.5–99.9	90.1–100.0	K88	
—	—	—	100.0–108.0	100.1–108.0	K89	
—	—	—	—	108.1–119.0	K90	
—	—	—	—	119.1–130.0	K92	
—	—	—	—	—	K94	
—	—	—	—	—	K96	

Table 335 for Class 48

Full Load Amps				Heater Catalog No	List Price \$
48DC	48GC	48HA	48JA		
1.56–1.69	—	—	—	K21	
1.70–1.84	—	—	—	K22	
1.85–1.98	—	—	—	K23	
1.99–2.19	—	—	—	K24	
2.20–2.43	—	—	—	K26	
2.44–2.63	—	—	—	K27	
2.64–2.95	—	—	—	K28	
2.96–3.21	—	—	—	K29	
3.22–3.45	—	—	—	K31	
3.46–3.81	—	—	—	K32	
3.82–4.10	—	—	—	K33	
4.11–4.46	—	—	—	K34	
4.47–5.10	—	—	—	K36	
5.11–5.49	—	—	—	K37	
5.50–6.21	—	—	—	K39	
6.22–6.76	—	—	—	K41	
6.77–7.62	—	—	—	K42	
7.63–8.07	—	—	—	K43	
8.08–9.19	—	—	—	K49	
9.20–10.0	—	—	—	K50	
10.1–11.0	—	—	—	K52	
11.1–12.0	—	—	—	K53	
12.1–12.7	—	—	—	K54	
12.8–13.5	—	—	—	K55	
13.6–14.5	—	—	—	K56	
14.6–15.7	—	—	—	K57	
15.8–16.7	—	—	—	K58	
16.8–17.9	—	—	—	K60	
18.0–19.2	18.0–19.2	—	—	K61	
19.3–20.5	19.3–20.5	23.2–25.1	—	K62	
20.6–22.5	20.6–22.5	25.2–27.3	—	K63	
22.6–24.8	22.6–24.8	27.4–30.4	—	K64	
24.9–27.6	24.9–27.6	30.5–33.3	—	K67	
27.7–30.0	—	33.4–36.5	—	K68	
—	27.7–30.1	36.6–39.3	—	K69	
—	30.2–33.1	39.4–43.5	—	K70	
—	33.2–36.7	43.6–46.6	43.0–46.5	K72	
—	36.8–40.1	46.7–51.1	46.6–50.9	K73	
—	40.2–45.5	51.2–56.3	51.0–55.9	K74	
—	45.6–47.9	56.4–61.1	56.0–59.1	K75	
—	48.0–52.7	61.2–64.9	59.2–68.7	K76	
—	52.8–55.1	65.0–71.9	—	K77	
—	55.2–60.0	72.0–80.7	68.8–80.7	K78	
—	—	80.8–92.7	80.8–92.7	K85	
—	—	92.8–100.0	92.8–103.9	K86	
—	—	—	104.0–113.5	K87	
—	—	—	113.6–127.9	K89	
—	—	—	128.0–143.9	K92	
—	—	—	144.0–163.9	K94	
—	—	—	164.0–180.0	K96	

Ordering Information

► 4th character of starter or contactor catalog number indicates model.

AC Coils — For Class 14, 17, 18, 22, 25, 26, 30, 32, 36, 37, 40, 43, 83, 84, 87, 88

	Size	Model	Volts		Catalog Number	List Price \$
			60Hz	50Hz		
	00-2½	P U (ESP200)	24 120 110-120/220-240 208 220-240 277 220-240/440-480 440-480 575-600	24 110 110/190-220 — 190-220 240 190-220/380-440 380-440 550	75D73070J 75D73070F 75D73070A 75D73070D 75D73070G 75D73070L 75D73070C 75D73070H 75D73070E	
	3, 3½	P U (ESP200)	24 120 110-120/220-240 208 220-240 277 220-240/440-480 440-480 575-600	24 110 110/190-220 — 190-220 240 190-220/380-440 380-440 550	75D73251J 75D73251F 75D73251A 75D73251D 75D73251G 75D73251L 75D73251C 75D73251H 75D73251E	
	4	G U (ESP200)	24 120 120/220-240 208 220-240 277 220-240/440-480 440-480 575-600	24 110 110/190-220 — 190-220 240 190-220/380-440 380-440 550	75D70131J 75D70131F 75D70131A 75D70131D 75D70131G 75D70131L 75D70131C 75D70131H 75D70131E	
	4, 5	V (Vacuum)	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	3RT1966-5AB31 3RT1966-5AF31 3RT1966-5AM31 3RT1966-5AP31 3RT1966-5AU31 3RT1966-5AV31 3RT1966-5AR31 3RT1966-5AT31	
	5	P	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	3RT1965-5AB31 3RT1965-5AF31 3RT1965-5AM31 3RT1965-5AP31 3RT1965-5AU31 3RT1965-5AV31 3RT1965-5AR31 3RT1965-5AT31	
	6	P V (Vacuum)	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	23-26 110-127 200-220 220-240 240-277 380-420 440-480 575-600	3RT1975-5AB31 3RT1975-5AF31 3RT1975-5AM31 3RT1975-5AP31 3RT1975-5AU31 3RT1975-5AV31 3RT1975-5AR31 3RT1975-5AT31	
	7	H	100-250 150-500	100-250 150-500	75ZAF750-70 75ZAF750-71	
	8	H	100-250	100-250	75ZAF1650-70 ^①	

① Set of 2 coils. Recommend to change printed circuit board when changing coils. 49ZP1650 see page 9/132.

Replacement Parts

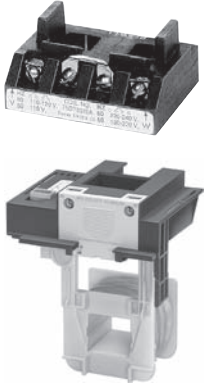
Starters and Contactors – DC Coils, Late Break Aux Contacts, Rectifiers, Contact Kits

Selection

Ordering Information


- 4th character of starter or contactor catalog number indicates model.
- DC Coils for Size 00-4 require Late Break Interlock.

DC Coils — For Class 14, 17, 18, 22, 25, 26, 30, 32, 40, 43


	Size	Model	Volts DC	Catalog Number	List Price \$
	00–2½	P U (ESP200)	12	75D73070R	
			24	75D73070S	
			32	75D73070T	
			48	75D73070U	
			125	75D73070V	
			250	75D73070W	
	3, 3½	P U (ESP200)	12	75D73251R	
			24	75D73251S	
			32	75D73251T	
			48	75D73251U	
			125	75D73251V	
			250	75D73251W	
	4	G U (ESP200)	48	75D70131U	
			125	75D70131V	
	4, 5	V (Vacuum)	250	75D70131W	
			23-26	3RT1966-5AB31	
			42-48	3RT1966-5AD31	
			110-127	3RT1966-5AF31	
			240-277	3RT1966-5AU31	

Note: For sizes 7 & 8 contactors the AC coils are used for DC see page 9/129.


Late Break Auxiliary Contacts

	Control Size	Model	Catalog Number	List Price \$
	00–4	P, G, S, T	49AB01LB	

Board for Size 8 Contactor

	Control Size	Model	Catalog Number	List Price
	8	H	49ZP1650	

Contact Kits – Single Pole Stationary and Movable Contacts, Contact Spring^①

Description	Size	Number of Poles in Kit	Model (4th position in part number)	Catalog Number	List Price \$
	Internal Aux Contact (00-1¾) 00 0		P, U P, U P, U	75AF14 75BF14 75CF14	
	1 1¾–1P	1	P, U P, U	75DF14 75EF14	
	2	1	P, U	75FP14	
	2½	1	P, U	75GP14	
	3	1	P, U P, U	75HF14 75IF14	
	3½	1	P, U P, U	75HF14 75IF14	
	4 4 (Vacuum)	1 3 (Bottles)	G, T V, C	75JG14 3RT1964-6V	
	5 5 (Vacuum)	3 3 (Bottles)	P V, C	3RT1966-6A 3RT1966-6V	
	6 6 (Vacuum)	3 3 (Bottles)	P V, C	3RT1976-6A 3RT1976-6V	
	14, 40	7 8	H H	49ZL750 49ZL1650	

Armature and Magnet Kits

Size	Catalog Number	List Price \$
00–2½	49AMSA2	
3–3½	49AMSA3	
4	49AMSA4	

① On 3-phase controls, all 3-poles should be replaced - 3 kits required.

Replacement Parts

Starters and Contactors – Coil VA Ratings and Overload Relays

Selection

Coil VA Ratings

Device Type	Contactors Size	Amps	Volts	Number of Poles	Total Inrush VA	Total Sealed VA
NEMA Starter	00 thru 2 1/2	—	—	—	218	25
	3 thru 3 1/2	—	—	—	310	26
	4	—	—	—	510	51
	5	—	—	—	590	6.7
	6	—	—	—	830	9.2
	7	—	—	—	850	12
	8	—	—	—	1900	48
	4,5,6 (Vacuum)	—	—	—	630	7.4
Lighting Contactor Mechanically Held (CLM)	—	20	—	2-12	625	6
	—	30	—	2-5	410	40
	—	60	—	2-3	410	40
	—	60	—	4-5	600	40
	—	100 - 200	—	2-3	900	200
	—	100 - 200	—	4-5	1300	130
	—	300 - 400	—	3	1600	550
Lighting Contactor Electrically Held Held (LC)	—	30	ALL	2-12	248	28
Lighting Contactor Electrically Held Held (LE)	—	20	ALL	3 and 4	31.7	4.8
	—	30	ALL	3 and 4	87	9.4
	—	60	ALL	3	166	12.6
	—	100	ALL	3	300	21
	—	200	ALL	3	300	5.6
	—	300	ALL	3	590	6.7
	—	400	ALL	3	830	9.2

Overload Relays^{①②} – For Class 14, 17, 18, 22, 25, 26, 30, 32, 83, 84, 87

Size	Half Size	Model	Number Poles	Ambient Comp Bimetal			
				Catalog Number (1) NC	List Price \$	Catalog Number (1) NO/NC	List Price \$
00-1	—	P	1 3	48DC18AA3 48DC38AA3		48DC39AA3	
1P	—	P	1	48EC18AA3			
—	1 1/4	P	3	48EC38AA3		48EC39AA3	
2	—	P	1 3	48GC18AA3 48GC38AA3		48GC39AA3	
—	2 1/2	P	1 3	48GC18AA3 48GC38AA3		48GC39AA3	
3	—	P	3	48HC38AA3			
—	3 1/2	P	3	48HC38AA3			
4	—	G	3	48JC38AA3			

For Starter and Contactor replacement parts not found in this section, please refer to Field Modification kits found starting on page 9/103.

① For replacement Solid State overload relays, please see the Overload Relay section found starting on page 9/64.





② Includes overload mounting plate to be coupled to contactor mounting plate.

Replacement Parts

Lighting and Heating Contactors, Type LC, LE, CLM, CMF, CMN

• Revised •
07/20/15



Selection

Power Pole Kits	Class	Enclosure type	Contactor Size (Amp)	Description	Catalog No.
	LC	Open, 1, 12, 4/4X	30	Single power pole Double power pole	49LCPPIA 49LCPPIA
Replacement Coil Kits	Class	Enclosure type	Description	Catalog No.	
	LC	30	24V 60Hz / 20V 50Hz 115-120V 60Hz / 110V 50Hz 200-208V 60Hz 230-240V 60Hz / 220V 50Hz 277V 60Hz / 240V 50Hz 347V 60Hz 460-480V 60Hz / 440V 50Hz 575-600V 60Hz / 550V 50Hz	75LCC024A 75LCC120A 75LCC208A 75LCC240A 75LCC277A 75LCC347A 75LCC480A 75LCC600A	
	LE	20, 30 60 100	NA 24VAC 50/60Hz 110VAC 50Hz / 120VAC 60Hz 208VAC 50/60Hz 220VAC 50Hz / 240VAC 60Hz 277VAC 60Hz 347VAC 60Hz 480VAC 60Hz 600VAC 60Hz 24VAC 50/60Hz 110VAC 50Hz / 120VAC 60Hz 208VAC 50/60Hz 220VAC 50Hz / 240VAC 60Hz 277VAC 60Hz 347VAC 60Hz 480VAC 60Hz 600VAC 60Hz	NA 3RT19355AC21 3RT19355AK61 3RT19355AM21 3RT19355AP61 3RT19355AU61 3RT19355AV61 3RT19355AT61 3RT19455AC21 3RT19455AK61 3RT19455AM21 3RT19455AP61 3RT19455AU61 3RT19455AV61 3RT19455AT61	
Replacement Contact Kits	Class	Enclosure type	Description	Catalog No.	
	LC	30	NA	NA	
	LE	20, 30 60 100 200 300 400	NA 1 contact kit includes 3 moving and 6 fixed contacts.	NA 3RT1935-6A 3RT1945-6A 3RT1956-6A 3RT1965-6A 3RT1975-6A	

AC Coils 20 Amps^②

Type	Contactor Size	Number of Poles	120V, 60Hz 110V, 50Hz	List Price \$	240V, 60Hz 208V, 50Hz	List Price \$	277V 50/60Hz	List Price \$
CLM	20 Amp	2-12	CLM4097341		CLM4097342		CLM4097343	

AC Coils 30-400 Amps^③

 CLMC4C120  CLMGU3C120	Type	Contactor Size	Number of Poles	Catalog Number							List Price \$
				24V AC	120V AC	208V AC	220/240V AC	277V AC	480V AC	600V AC	
	CLMT C	30 Amp	2-3-Pole	CLMC4C024	CLMC4C120	CLMC4C208	CLMC4C240	CLMC4C277	CLMC4C480	CLMC4C600	
			4-Pole	CLMC4C024	CLMC4C120	CLMC4C208	CLMC4C240	CLMC4C277	CLMC4C480	CLMC4C600	
			5-Pole	CLMC5C024	CLMC5C120	CLMC5C208	CLMC5C240	CLMC5C277	CLMC5C480	CLMC5C600	
	CLMT D	60 Amp	2-3-Pole	CLMD3C024	CLMD3C120	CLMD3C208	CLMD3C240	CLMD3C277	CLMD3C480	CLMD3C600	
			4-Pole	CLMD5C024	CLMD5C120	CLMD5C208	CLMD5C240	CLMD5C277	CLMD5C480	CLMD5C600	
			5-Pole	CLMD5C024	CLMD5C120	CLMD5C208	CLMD5C240	CLMD5C277	CLMD5C480	CLMD5C600	
	CLMT E	100, 200 Amp	2-3-Pole	CLME3C024	CLME3C120	CLME3C208	CLME3C240	CLME3C277	CLME3C480	CLME3C600	
			4-Pole	CLME5C024	CLME5C120	CLME5C208	CLME5C240	CLME5C277	CLME5C480	CLME5C600	
5-Pole			CLME5C024	CLME5C120	CLME5C208	CLME5C240	CLME5C277	CLME5C480	CLME5C600		
CLMT G Latching Coil Unlatch Coil	300/400 Amp	2-3-Pole	—	CLMGL3C120	CLMGL3C208	CLMGL3C240	CLMGL3C277	CLMGL3C480	CLMGL3C600		
		2-3-Pole	—	CLMGU3C120	CLMGU3C208	CLMGU3C240	CLMGU3C277	CLMGU3C480	CLMGU3C600		

Control Module Rectifier^③

Type	Device	Contactor Size	Number of Poles	Catalog Number	List Price \$
CLM	CLM4C to CLM4F	30-200 Amps	All	CLMKCMR	

① Product Category: IEC.

② Coil kits for 20 amp CLM contactors include the coil clearing auxiliary contact.

③ For 30-200 amp CLM contactors, in the event that either the coil or the control module fails, it is recommended that both be replaced.

• Revised •
07/20/15

Replacement Parts

Lighting Contactors, CLM, CMB, CMF & CMN

Selection

Ordering Information

- **For CLM:** 5th character of contactor catalog number indicates Frame Size.
- **For CMB, CMF, CMN:** 4th character of contactor catalog number indicates Frame Size.

Main Contacts 20 Amp Lighting Contactors

Type	Contact Size	Number of Poles	Location	Catalog Number	List Price \$
CLM	20 Amp	2	Top or Bottom	CLM4097331	
		3	Top	CLM4097332	
		4	Top or Bottom	CLM4097333	
		6	Top or Bottom	CLM4097334	

Main Contacts 30–400 Amp Lighting Contactors

Type	Frame Size	Contact Size	Number of Poles	Catalog Number	List Price \$
CLM	C	30 Amp	2	CLMCCK02	
			3	CLMCCK03	
			4	CLMCCK04	
			5	CLMCCK05	
	D	60 Amp	2	CLMDCK02	
			3	CLMDCK03	
			4	CLMDCK04	
			5	CLMDCK05	
	E	100 Amp	2	CLMECK02	
			3	CLMECK03	
			4	CLMECK04	
			5	CLMECK05	
	F	200 Amp	2	CLMFCK02	
			3	CLMFCK03	
			4	CLMFCK04	
			5	CLMFCK05	
	G	300 Amp	2	CLMGCK02	
			3	CLMGCK03	
	H	400 Amp	2	CLMHCK02	
			3	CLMHCK03	

Auxiliary Contact Blocks 20 Amp Lighting Contactors^②

Type	Contact Size	Contacts	Catalog Number	List Price \$
CLM	20 Amp	1 Form C NO, NC Contact 2 Form C NO, NC Contacts	CLM4097291 CLM4097292	

Auxiliary Contact Blocks 30–400 Amp Lighting Contactors

Type	Frame Size	Contact Size	Contact Configuration	Catalog Number	List Price \$
CLM	C to F ^①	30–200 Amps	1 NO and 1 NC 2 NC 2 NO 1 Coil Clearing NO and NC	CLMFCAK11 CLMFCAK02 CLMFCAK20 CLMFCK11	
	G to H ^①	300–400 Amps	1 NO and 1 NC 2 NC 2 NO 1 Coil Clearing NO and NC	CLMHCAK11 CLMHCAK02 CLMHCAK20 CLMHCK11	

① Maximum 1 block per contactor.


② Maximum 2 blocks per contactor.

Selection

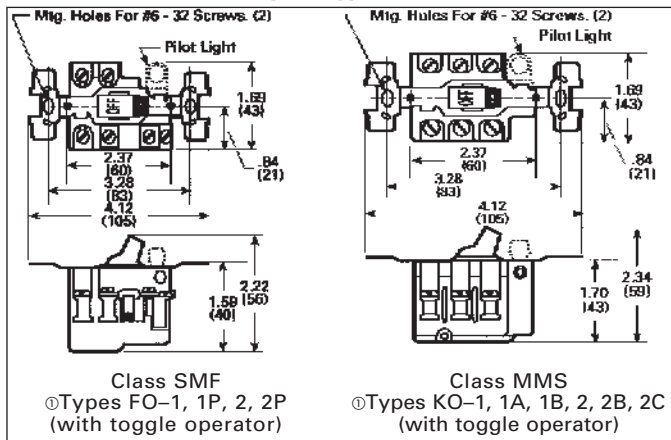
Replacement Handle Assemblies and Disconnect Mechanisms Enclosure Types 1, 3R, 4, 4X Stainless Steel & 12

Class	Disconnect (Amps)	Enclosure Size	Handle Assembly Only		Handle Assembly and Disconnect Mechanism	
			Catalog Number	List Price \$	Catalog Number	List Price \$
17, 25, 32, 84, 87, CM, LE	30, 60 & 100	All Standard and Extra-wide Sizes	75D73944015		75D68257103	
37, 88	30 & 60		75D73944018		75D68257048	
17, 25, 32, 84	200		75D73944015		75D68257105	
37, 88, CM, LE	200		75D73944015		75D68257063	
87	200		75D73944023		75D68257068	
17, 25, 37, 87, 88, CM, LE	400 & 600		75D73944027		75D68257078	
Class	Motor Circuit Interrupter (Amps)	Enclosure Size	Handle Assembly Only		Handle Assembly and Disconnect Mechanism	
			Catalog Number	List Price \$	Catalog Number	List Price \$
18, 26, 32, CM, LE	3 - 125	(24"H x 11"W x 8"D), (24"H x 20"W x 8"D)	75D73944025		75D68257080	
18, 26, 32	100 - 125	(36"H x 24"W x 8"D)	75D73944025		75D68257073	
18, 26, 32	150 & 250	All Standard Sizes	75D73944028		75D68257089	
18, 26, 37, 87, 88, CM	300 - 600		75D73944027		75D68257078	
87	3 - 125		75D73944025		75D68257080	
87	150		75D73944028		75D68257089	
87	250		75D73944011		75D68257077	
37, 88	30 - 125		75D73944025		75D68257073	
37, 84, 88, CM	150 - 250		75D73944011		75D68257077	
84	3 - 125		75D73944025		75D68257074	

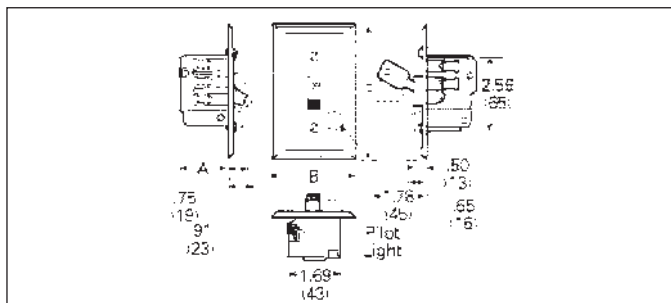
Quarter Turn Assemblies

Description		Class	Enclosure Type	Catalog Number	List Price \$
	Quarter-Turn Latch	17, 18, 25, 26, 32, 87 & 88	1, 3/3R & 12	75D46260004	
			4 & 4X	75D46260005	

Class SMF and MMS Open Type

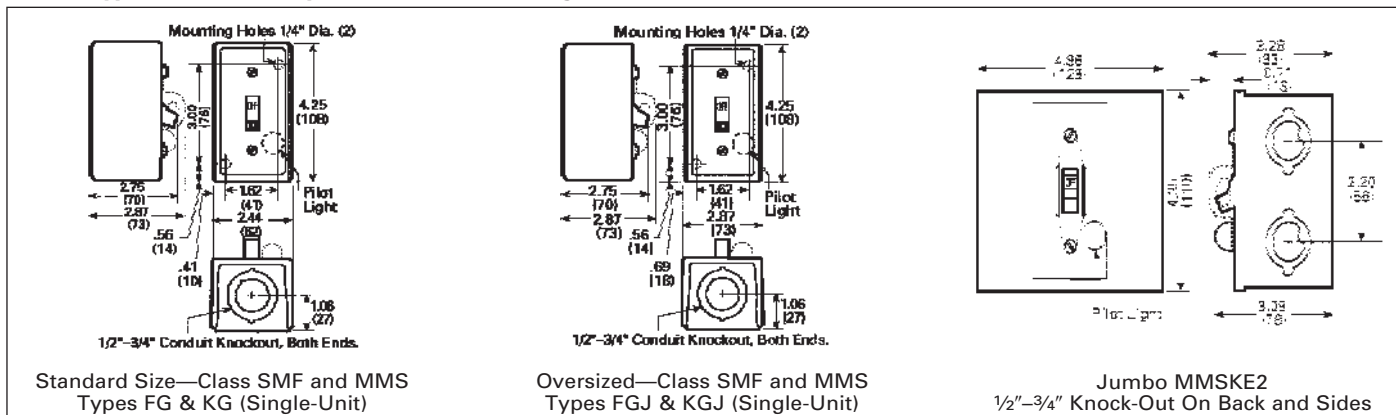


NEMA Type 1B General Purpose Flush Mounting



Device	Type of Operator	Type	Dimensions in Inches (mm)		
			A	B	C
Class SMF Fractional HP Starter	Toggle	FF1, 1P, 2, 2P	1.44 (37)	2.75 (70)	4.50 (114)
		FS1, 1P, 2, 2P	1.44 (37)	3.50 (89)	5.25 (133)
		FSJ1P, 2P	1.44 (37)	3.50 (89)	5.25 (133)
	Key	FF3, 3P, 4, 4P	1.44 (37)	2.75 (70)	4.50 (114)
		FS3, 3P, 4, 4P	1.44 (37)	3.50 (89)	5.25 (133)
		FSJ3P, 4P	1.44 (37)	3.50 (89)	5.25 (133)
Class MMS Motor Starting Switch	Toggle	KF1, 1A, 1B, 2, 2B, 2C	1.75 (44)	2.75 (70)	4.50 (114)
		KS1, 1A, 1B, 2, 2B, 2C	1.75 (44)	3.50 (89)	5.25 (133)
		KSJ1A, 1B, 2B, 2C	1.75 (44)	3.50 (89)	5.25 (133)
	Key	KF3, 3A, 3B, 4, 4B, 4C	1.75 (44)	2.75 (70)	4.50 (114)
		KS3, 3A, 3B, 4, 4B, 4C	1.75 (44)	3.50 (89)	5.25 (133)
		KSJ3A, 3B, 4B, 4C	1.75 (44)	3.50 (89)	5.25 (133)

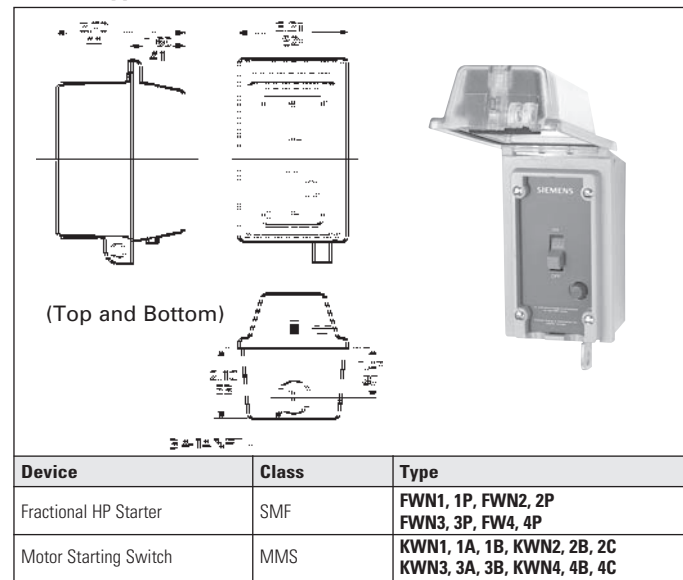
NEMA Type 1 General Purpose Surface Mounting Enclosures



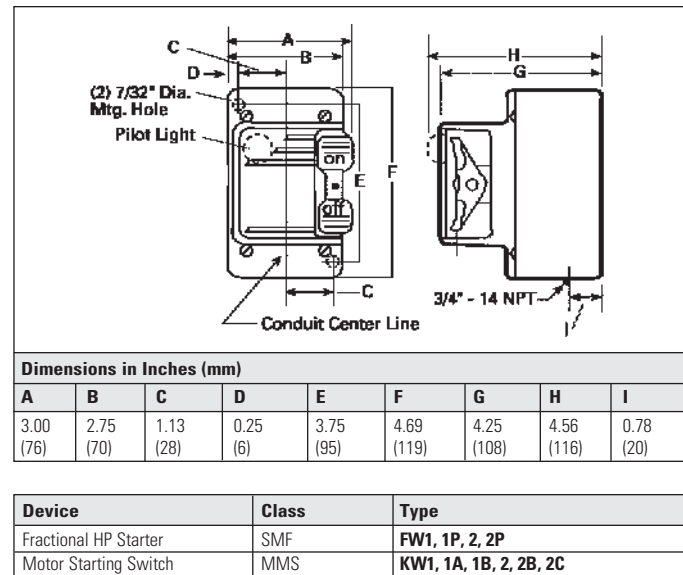
Note: Dimensions for reference, not for construction.
Dimensions are in inches (mm).

① Dimensions typical for key operator devices.

NEMA Type 3R, 4 and 12



NEMA Type 4 Watertight Die Cast Zinc Enclosure



Manual Control

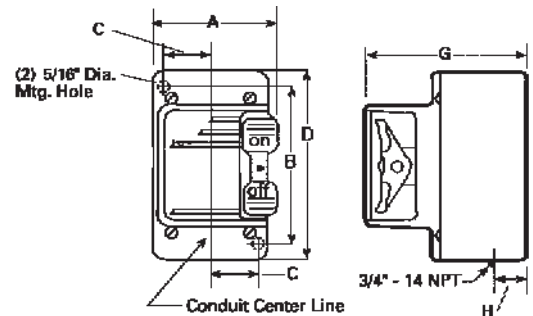
Class SMF, MMS

Dimensions

NEMA Type 7 and 9 Cast Aluminum Enclosure

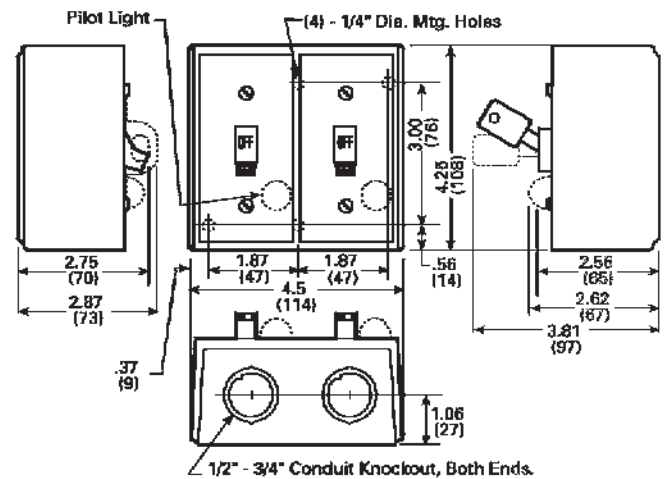
Dimensions in Inches (mm)					
A	B	C	D	G	H
4.00 (101)	5.75 (146)	1.38 (35)	6.36 (161)	4.38 (111)	1.20 (30)

Device	Class	Type
Fractional HP Starter	SMF	FR1, FR2
Motor Starting Switch	MMS	KR1, KR2



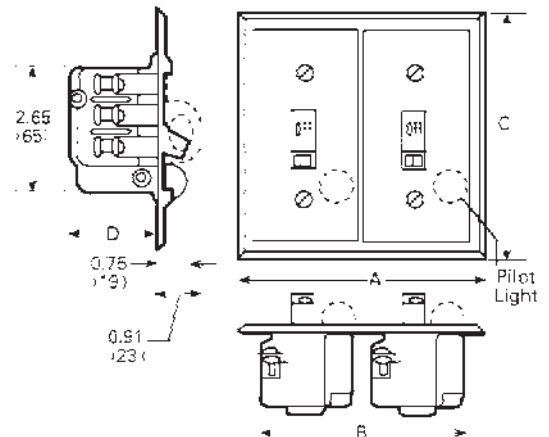
NEMA Type 1 General Purpose Enclosure For Two Unit Devices

Device	Type of Operator	Class	Type
One Starter	Toggle	SMF	FG02, 02P
	Key	SMF	FG04P
Two Starters	Toggle	SMF	FG222, 222P
	Key	SMF	FG44P
One Starter and One Sel. Switch ^①	Toggle	SMF	FG71, 71P, 72, 72P
	Key	SMF	FG74P
Reversing Switch ^②	Toggle	MRS	KG11, 11A, 11B, 22, 22A, 22B, 22C
Two Speed Starter	Toggle	SMF	FG11, 11P, 22, 22P
Two Speed Switch	Toggle	MMS	KG11, 11A, 11B, 22, 22B, 22C



NEMA Type 1B General Purpose Flush Mounting For Two Unit Devices

Device ^③	Type of Operator	Class	Type	A	B	C	D
Two Starters	Toggle	SMF	FF22, 22P	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
			FS22P	4.56 (116)	3.50 (89)	4.50 (114)	1.44 (37)
	Key	SMF	FF44P	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
			FS44P	4.56 (116)	3.50 (89)	4.50 (114)	1.44 (37)
One Starter and One Selector Switch ^④	Toggle	SMF	FF71, 71P, 72, 72P	5.25 (133)	0.75 (19)	5.25 (133)	2.00 (51)
			FS71P, 72P	4.56 (116)	3.50 (89)	4.50 (114)	2.00 (51)
	Key	SMF	FF74P	5.25 (133)	3.75 (95)	5.25 (133)	2.00 (51)
			FS74P	4.56 (116)	3.50 (89)	4.50 (114)	2.00 (51)
Reversing Switch	Toggle	MRS	KF11, 11A, 11B KF22, 22A 22B, 22C	5.25 (133)	3.75 (95)	5.25 (133)	1.75 (44)
Two Speed Switch	Toggle	SMF	FF11, 11P, 22, 22P	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)
Two Speed Switch	Toggle	MMS	KF11, 11A, 11B 22, 22B, 22C	5.25 (133)	3.75 (95)	5.25 (133)	1.44 (37)

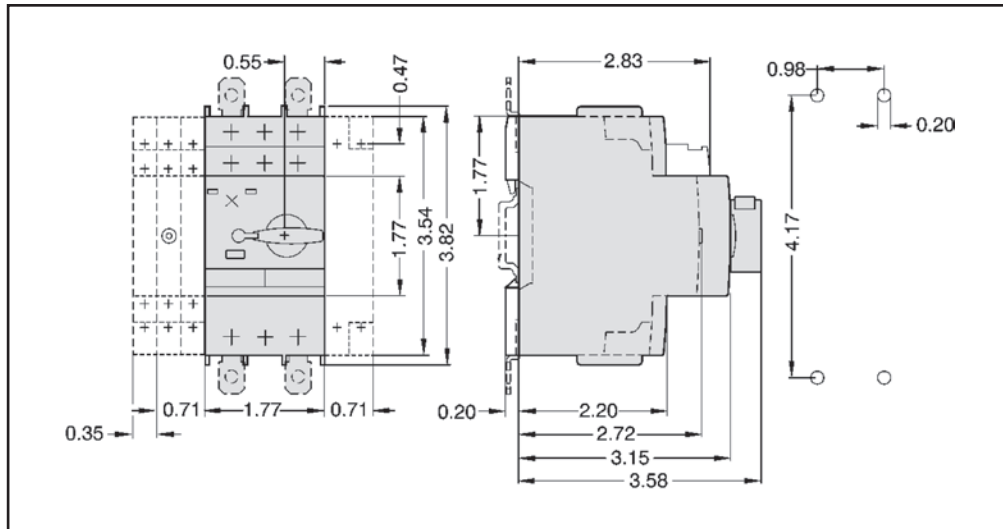


Note: Dimensions for reference, not for construction.
Dimensions are in inches (mm).

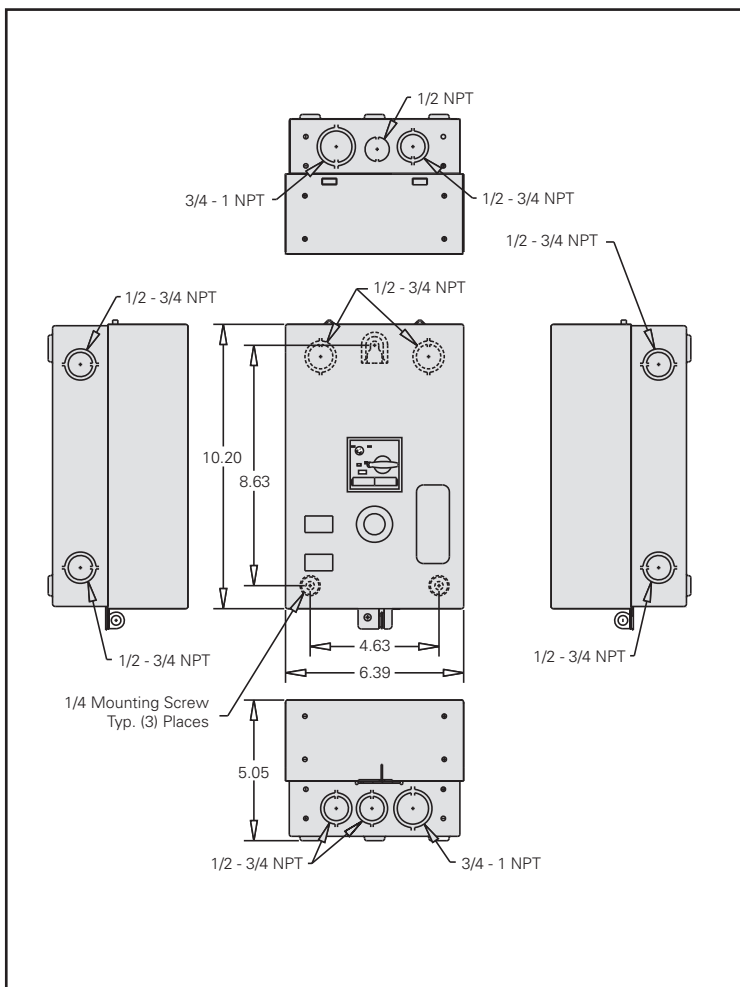
- ① Selector switch is on the left, increases overall depth to 3.50 in. (89 mm).
② Only one pilot light (located on right) is used on MRS switches.

- ③ Dimensions include factory wired power connections.
④ Selector switch is on the left, extends 1.62 in. (41 mm) from mounting surface.

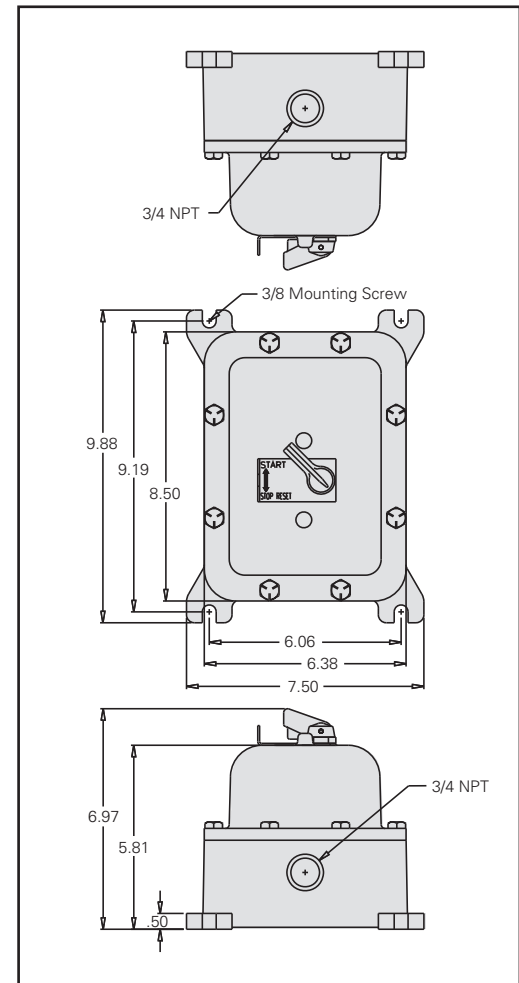
3RV102



Class 11 - NEMA 1 Enclosure



Class 11 - NEMA 7 & 9, 3 & 4, and NEMA 7 & 9 Enclosure

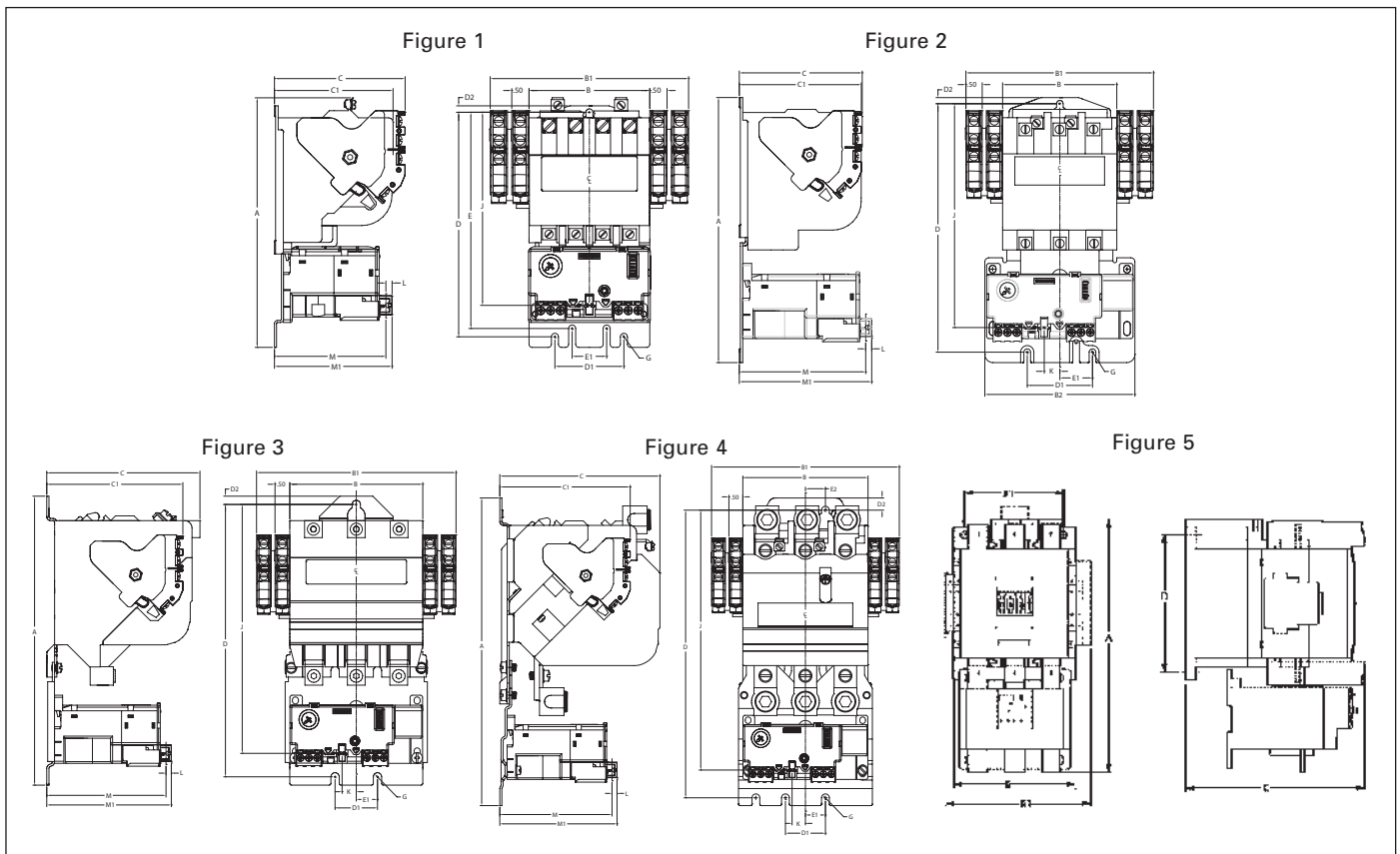


Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

Heavy Duty Motor Starters

Solid State Overload, Class 14

Dimensions



Open Type Solid State Overload

Size	Figure	Outline Dimensions						Mounting Dimensions						Mounting Screw	Reset Dimensions				
		A	B	B1	B2	C	C1	D	D1	D2	E	E1	E2	G	J	K	L	M	M1
00-1¼	1	7.44 (189)	3.50 (89)	5.75 (146)	—	3.75 (95)	3.50 (89)	6.50 (165)	2.00 (51)	0.19 (5)	6.27 (159)	1.00 (25)	—	#10	5.60 (142)	—	0.18 (5)	3.23 (82)	3.41 (87)
2-2½	2	8.13 (207)	3.50 (89)	5.75 (146)	4.60 (117)	4.00 (102)	3.77 (96)	7.62 (194)	2.00 (51)	0.19 (5)	—	1.00 (25)	—	#10	6.87 (174)	0.48 (12)	0.18 (5)	3.88 (99)	4.06 (103)
3-3½	3	9.78 (248)	4.50 (114)	6.75 (171)	—	5.19 (132)	4.66 (118)	9.22 (234)	1.44 (37)	0.28 (7)	—	0.72 (18)	—	0.25 (6)	8.43 (214)	0.48 (12)	0.18 (5)	4.04 (103)	4.22 (107)
4	4	11.06 (281)	4.50 (114)	6.75 (171)	—	5.75 (146)	4.66 (118)	10.34 (263)	1.44 (37)	0.44 (11)	—	0.72 (18)	0.72 (18)	0.25 (6)	9.35 (237)	0.48 (12)	0.18 (5)	4.04 (103)	4.22 (107)
5	5	12.76 (324)	5.71 (145)	6.89 (175)	—	8.54 (217)	—	7.09 (180)	4.72 (120)	—	—	—	—	0.35 (9)	—	—	—	—	—
6	6	13.03 (331)	6.30 (160)	7.48 (190)	—	9.29 (236)	—	7.09 (180)	5.12 (130)	—	—	—	—	0.35 (9)	—	—	—	—	—

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

Heavy Duty Motor Starters & Contactors

Ambient Compensated Bimetal Class 14

Dimensions

Figure 1

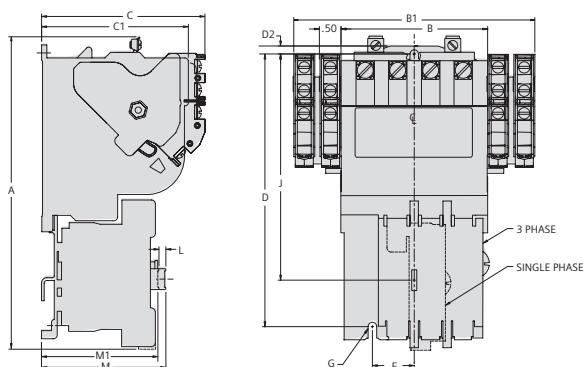


Figure 2

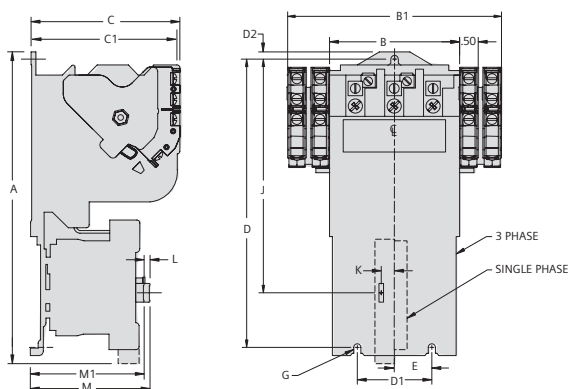


Figure 3

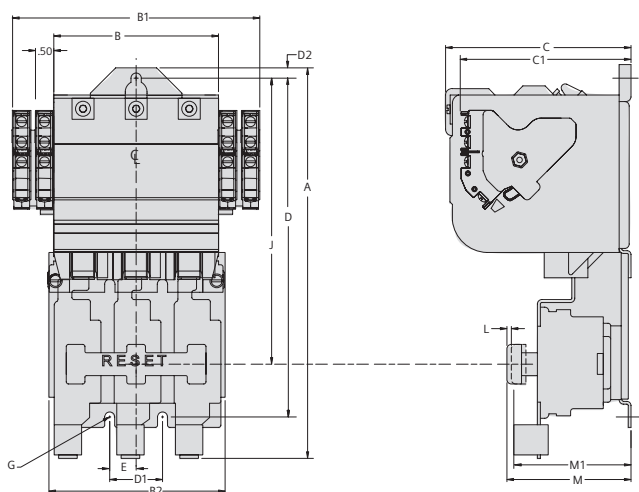
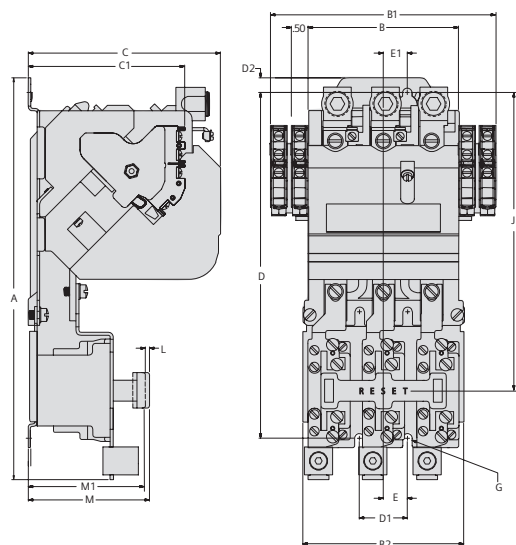


Figure 4



Open Type Ambient Compensated Bimetal Overload

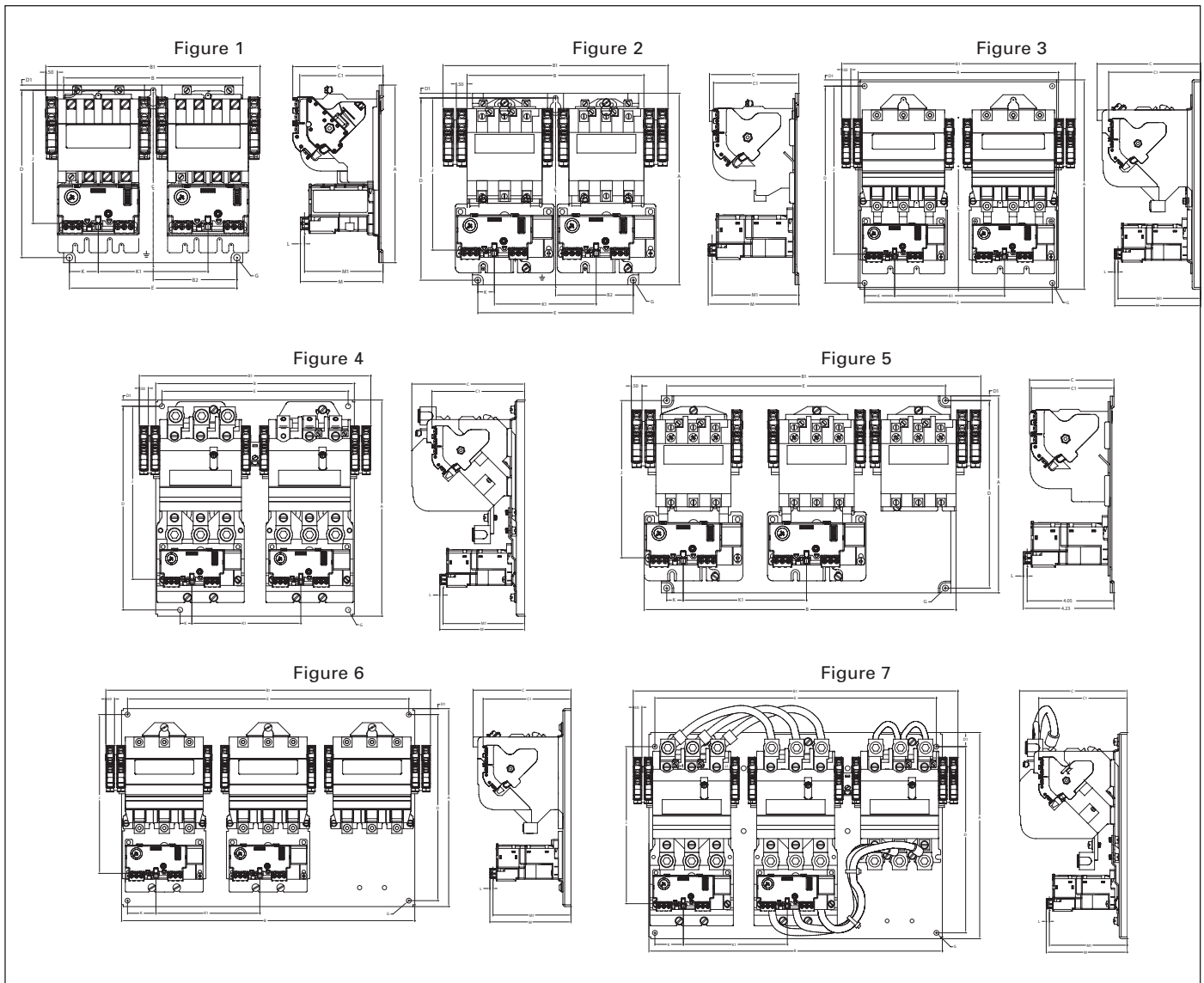
Size	Figure	Outline Dimensions					Mounting Dimensions					Mounting Screw	Reset Dimensions				
		A	B	B1	C	C1	D	D1	D2	E	E1	G	J	K	L	M	M1
00-1¼	1	7.45 (189)	3.50 (89)	5.75 (146)	3.89 (99)	3.50 (89)	6.50 (165)	—	0.19 (4.8)	1.00 (25)	—	#10	5.39 (137)	—	0.16 (4)	2.97 (75)	2.81 (71)
2-2½	2	8.38 (213)	3.50 (89)	5.75 (146)	4.00 (102)	3.77 (96)	7.75 (197)	2.00 (51)	0.19 (4.8)	1.00 (25)	—	#10	6.28 (160)	0.36 (9)	0.16 (4)	3.22 (82)	3.06 (78)
3-3½	3	10.66 (271)	4.50 (114)	6.75 (171)	5.06 (129)	4.66 (118)	9.25 (235)	1.44 (37)	0.28 (7)	0.72 (18)	—	0.25 (6)	7.81 (198)	—	0.12 (3)	3.39 (86)	3.27 (83)
4	4	12.02 (305)	4.50 (114)	6.75 (171)	5.75 (146)	4.66 (118)	10.34 (263)	1.44 (37)	0.44 (11)	0.72 (18)	0.72 (18)	0.25 (6)	8.78 (223)	—	0.12 (3)	3.63 (92)	3.51 (89)

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

Reversing & Multispeed Heavy Duty Starters

Solid State Overload Class 22, 30

Dimensions



Class 22 Reversing & Class 30 2 Speed/2 Winding

Size	Figure	Outline Dimensions						Mounting Dimensions			Mounting Screw	Reset Dimensions					
		A	B	B1	B2	C	C1	D	D1	E		J	K	K1	L	M	M1
00-1½	1	7.69	7.75	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.77	1.25	4.75	0.18	3.58	3.40
2-2½	2	8.94	8.25	10.50	3.62	4.17	3.98	8.50	0.22	7.25	#10	7.10	0.77	4.75	0.18	4.23	4.05
3-3½	3	11.44	10.94	12.75	—	5.65	5.03	10.75	0.34	10.25	#10	9.18	1.64	6.00	0.18	4.69	4.51
4	4	11.91	10.94	12.75	—	6.22	5.12	11.22	0.34	10.25	0.25	9.53	0.65	6.00	0.18	4.68	4.50

Class 30 2 Speed/1 Winding

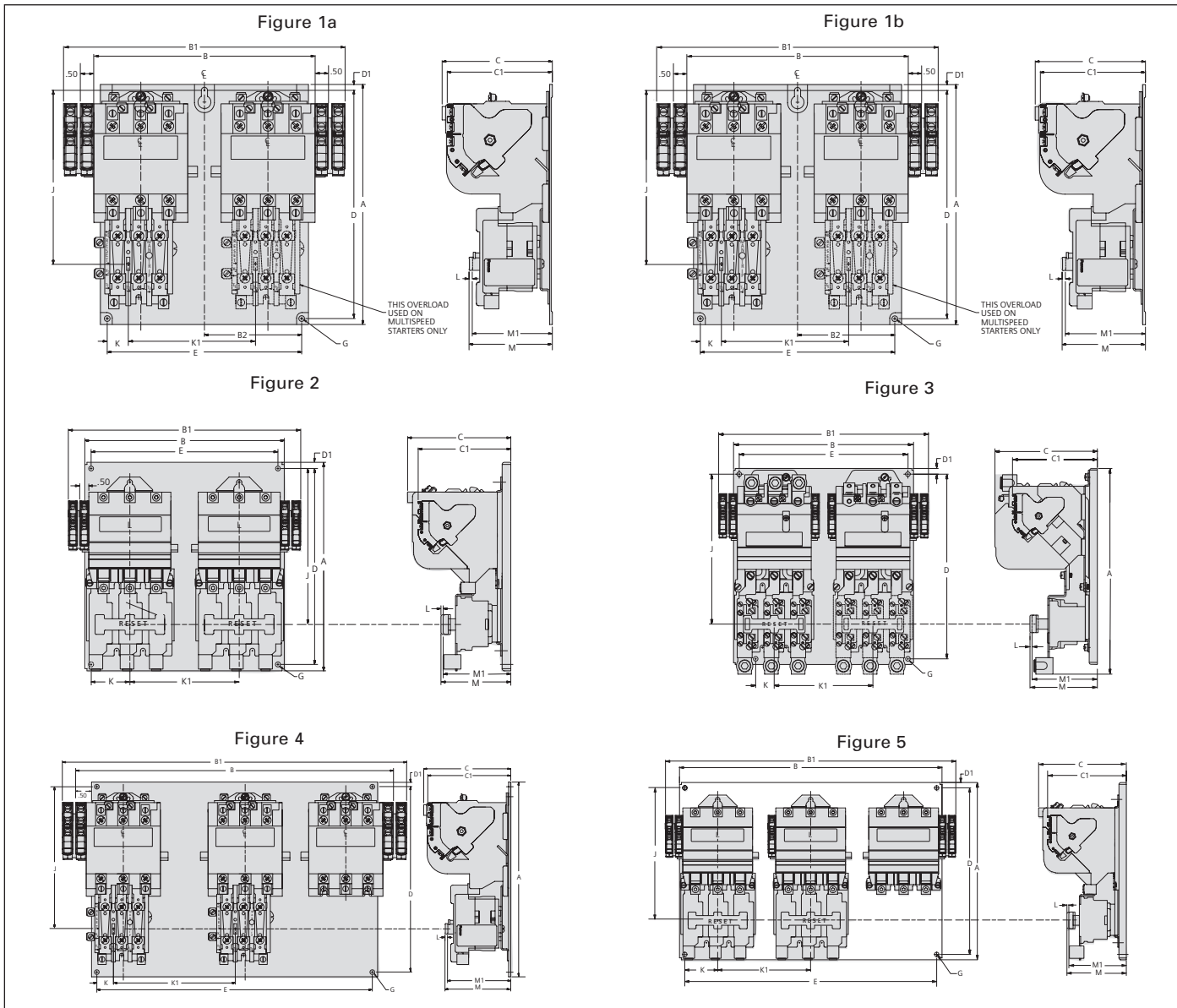
Size	Figure	Outline Dimensions						Mounting Dimensions			Mounting Screw	Reset Dimensions					
		A	B	B1	B2	C	C1	D	D1	E		J	K	K1	L	M	M1
00-1½	1	7.69	7.75	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.77	1.25	4.75	0.18	3.58	3.40
2-2½	5	9.19	14.55	16.30	—	3.94	3.85	8.75	0.22	13.00	#10	7.33	0.77	5.75	0.18	4.23	4.05
3-3½	6	11.44	16.94	18.75	—	5.65	5.07	10.75	0.34	16.25	#10	9.18	1.64	6.00	0.18	4.68	4.50
4	7	11.91	16.94	17.75	—	6.22	5.12	10.75	0.82	16.25	#10	9.06	1.64	6.00	0.18	4.68	4.50

Note: Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.
Dimensions are in inches (mm).

Reversing & Multispeed Heavy Duty Starters

Ambient Compensated Bimetal Overload Class 22, 30

Dimensions



Class 22 Reversing & Class 30 2 Speed/2 Winding with Bimetal Overload

Size	Figure	Outline Dimensions						Mounting Screw			Mounting Dimensions	Reset Dimensions					
		A	B	B1	B2	C	C1	D	D1	E		J	K	K1	L	M	M1
00-1½	1a	7.69	8.25	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.60	1.25	4.75	0.16	3.12	3.07
2-2½	1b	8.94	8.25	10.50	3.62	4.17	3.98	8.50	0.22	7.25	#10	6.46	0.79	4.75	0.16	3.10	3.05
3-3½	2	11.44	10.94	12.94	—	5.66	5.08	10.75	0.34	10.25	#10	8.56	2.12	6.00	0.12	3.83	3.71
4	3	12.50	10.94	12.75	—	6.22	5.16	11.22	0.34	10.25	0.25	9.11	2.12	6.00	0.12	4.09	3.97

Class 30 2 Speed/1 Winding with Bimetal Overload

Size	Figure	Outline Dimensions						Mounting Screw			Mounting Dimensions	Reset Dimensions					
		A	B	B1	B2	C	C1	D	D1	E		J	K	K1	L	M	M1
00-1½	1a	7.69	8.25	10.50	3.62	3.92	3.61	7.25	0.22	7.25	#10	5.60	1.25	4.75	0.16	3.12	3.07
2-2½	4	9.19	14.56	16.25	—	4.11	3.92	8.75	0.22	13.00	0.25	6.71	0.78	5.75	0.16	3.10	3.05
3-3½	5	11.44	16.94	18.75	—	5.66	5.08	10.75	0.34	16.25	0.25	8.56	2.12	6.00	0.12	3.83	3.71

Note: Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.
Dimensions are in inches (mm).

Heavy Duty Contactors

Class 40

Dimensions

Full Voltage Open Type NEMA Contactor Size 00-8

Figure 1

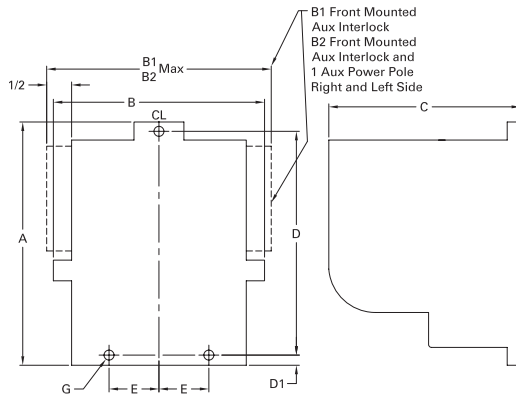


Figure 2

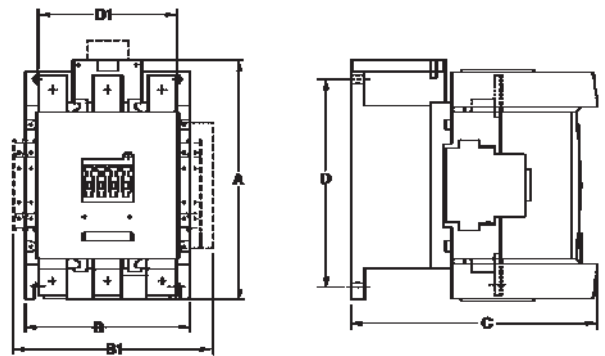


Figure 3

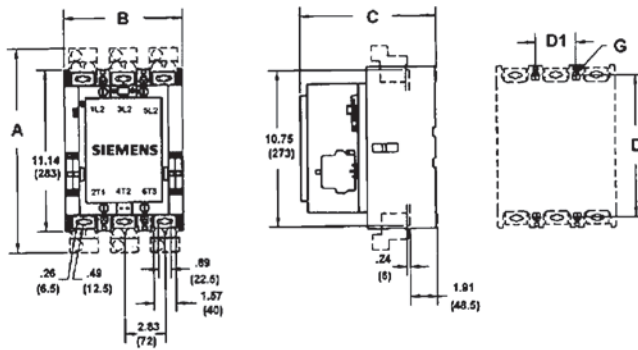
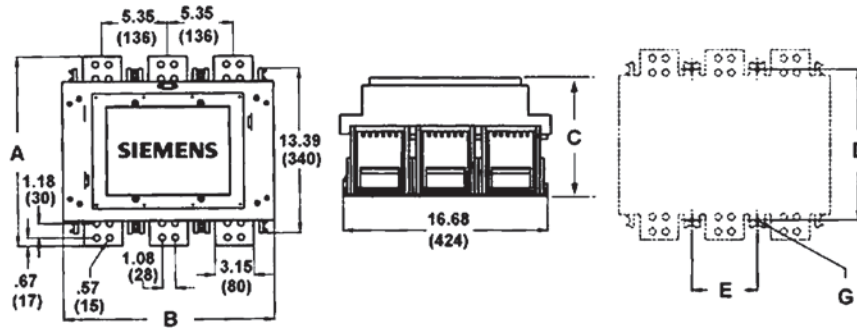


Figure 4



Open Type

Size	3rd Character of Catalog No.①	Outline Dimensions						Mounting Dimensions			Mounting Screw
		Fig	A	B	B1	B2	C	D	D1	E	
00-1¼	C, D, E	1	4.31 (110)	3.94 (100)	4.25 (108)	4.75 (121)	3.75 (70)	3.94 (100)	0.19 (5)	1.00 (25)	#10
2-2½	F, G	1	4.88 (124)	3.94 (100)	4.25 (108)	—	4.00 (102)	4.50 (114)	0.19 (5)	1.00 (25)	#10
3-3½	H, I	1	6.13 (156)	5.13 (130)	5.50 (140)	—	5.06 (129)	5.63 (143)	0.25 (6)	0.75 (19)	0.25 (6)
4	J	1	7.81 (198)	5.19 (132)	5.50 (140)	—	5.75 (146)	6.56 (167)	0.81 (21)	0.75 (19)	0.5 (13)
5	L	2	8.27 (210)	5.71 (145)	6.89 (175)	—	8.54 (217)	7.09 (180)	4.72 (120)	—	0.35 (9)
6	M	2	8.43 (214)	6.3 (160)	7.48 (190)	—	9.29 (236)	7.09 (180)	5.12 (130)	—	0.35 (9)
7	N	3	14.05 (357)	8.27 (210)	—	—	9.53 (242)	9.80 (249)	2.83 (72)	—	0.25 (6)
8	P	4	15.41 (392)	17.23 (438)	—	—	10.56 (268)	12.28 (312)	—	5.35 (136)	0.35 (9)

Note: Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.
Dimensions are in inches (mm).

① 3rd character of catalog number identifies contactor rating.

Figure 1

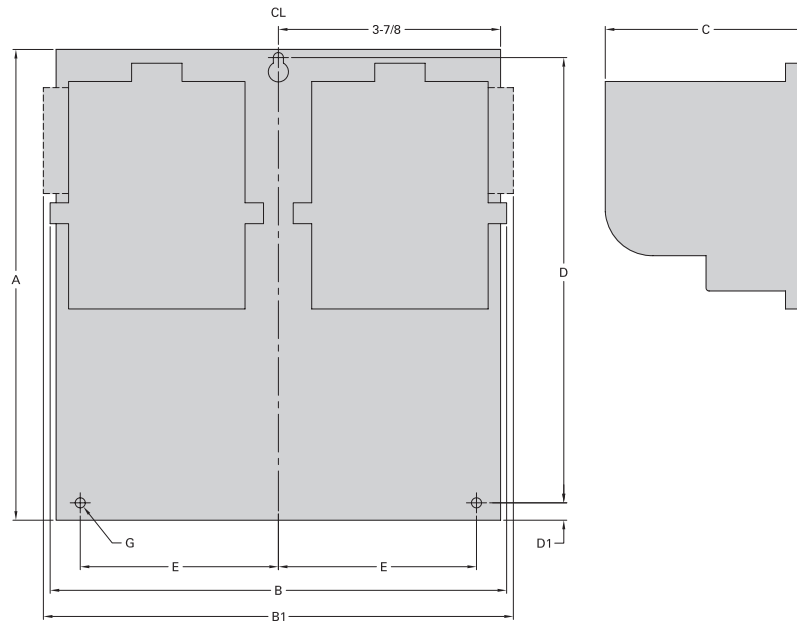
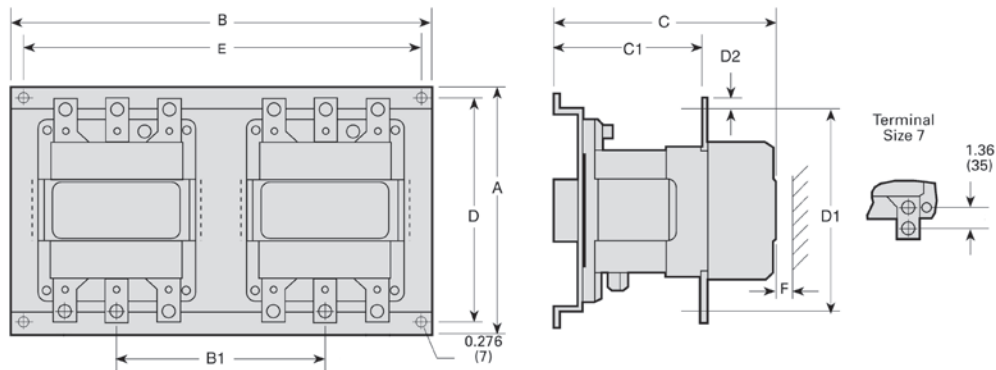


Figure 2



Open Type Horizontal Mounted

Size	Fig.	Outline Dimensions					Mounting Dimensions				Mounting Screw
		A	B	B1	C	C1	D	D1	E	F	
00-1¼	1	7.69 (195)	7.75 (197)	9.25 (235)	3.88 (98)	—	7.25 (184)	0.25 (6)	3.63 (92)	—	#10
2, 2½	1	8.94 (227)	7.75 (197)	9.25 (235)	4.56 (116)	—	8.5 (216)	0.25 (6)	3.63 (92)	—	#10
3-3½	1	11.44 (291)	10.94 (278)	11.50 (292)	5.19 (132)	—	10.75 (273)	0.38 (6)	5.13 (130)	—	0.25
4	1	8.50 (216)	10.94 (278)	11.50 (292)	6.25 (159)	—	7.81 (198)	0.38 (6)	5.13 (130)	—	0.25
5	2	18.07 (459)	14.20 (361)	—	9.44 (240)	—	17.20 (437)	—	9.61 (244)	—	—
6	2	11.61 (295)	18.88 (480)	9.45 (240)	10.85 (276)	7.44 (189)	10.44 (265)	10.71 (272)	17.72 (450)	1.18 (30)	—

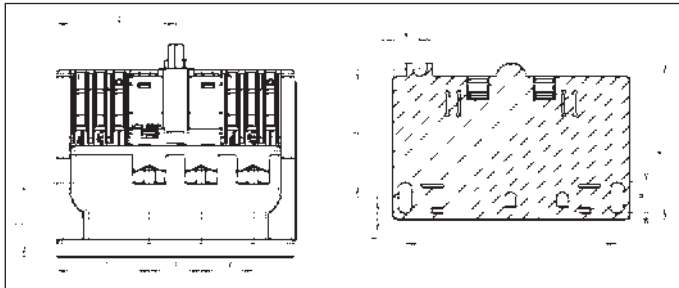
Note: Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.
Dimensions are in inches (mm).

Overload Relays & Current Transformers

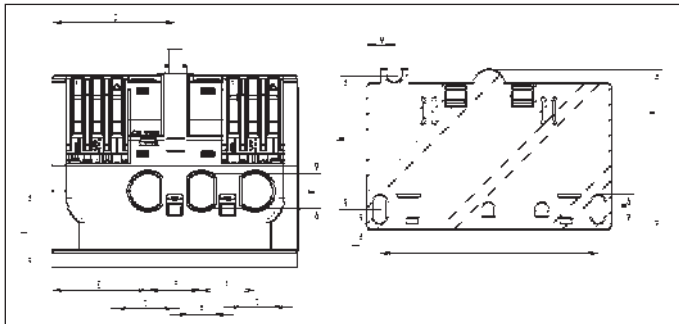
Solid State Overload

Dimensions

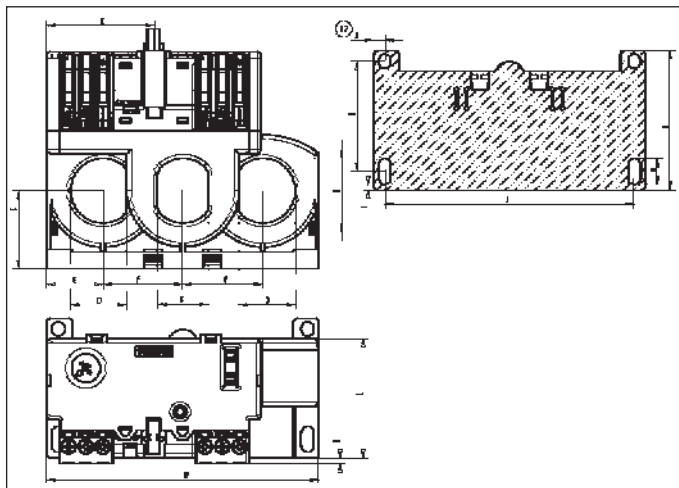
Dimensions "A" Frame—ESP200 Solid State Overload



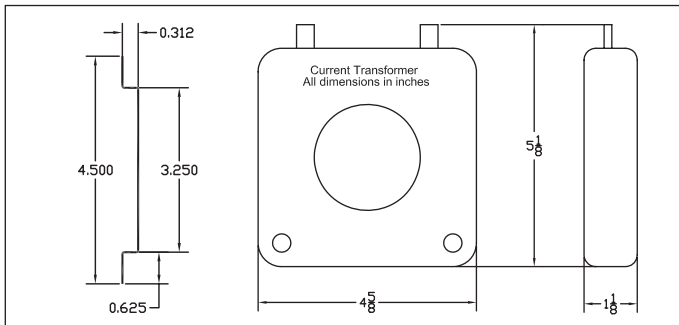
Dimensions "A1" Frame—ESP200 Solid State Overload



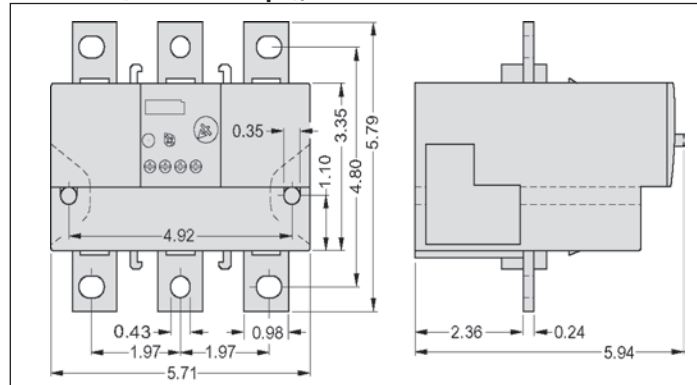
Dimensions "B" Frame—ESP200 Solid State Overload



Current Transformers (all CT's have the same dimensions)



Overload (55 - 630 Amps), SIRIUS 3RB20



Dimensions	Frame Size A		Frame Size A1		Frame Size B	
	mm	in.	mm	in.	mm	in.
A	80	3.15	80	3.15	100.4	3.95
B	12.6	0.5	12.6	0.5	8.6	0.34
C	27.7	1.1	28	1.10	32.6	1.28
D	44.85	1.77	44.85	1.77	44.85	1.77
E	34.9	1.37	34.9	1.37	23.5	0.93
F	19.6	0.77	19.6	.077	33.5	1.32
G	48.95	1.93	48.95	1.93	46.23	1.82
H	10.7	0.42	10.7	0.42	10.9	0.43
I	2.3	0.09	2.3	0.09	2.4	0.09
J	80	3.15	80	3.15	104.6	4.12
K	53.9	2.12	53.9	2.12	58.6	2.31
L	66.0	2.6	55.9	2.20	50	1.97
M	89.7	3.53	89.7	3.53	114	4.49
N	10.18	0.40	10.18	0.40	4.7	0.19
O	—	—	10.77	0.42	23.6	0.93
P	—	—	8.62	0.34	21.1	0.83
R	—	—	12.9	0.51	27.1	1.07
S	9.5	0.37	—	—	2.45	0.1
T	5.2	0.21	5.2	0.21	5.2	0.21

Note: When mounted on a plate, torque screws to 11 lb.in. (1.2 Nm).

Overload Relays

Panel Mounted Class 48 — Bimetal

Dimensions

1
2
3
4
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6
7
8
9

Figure 1

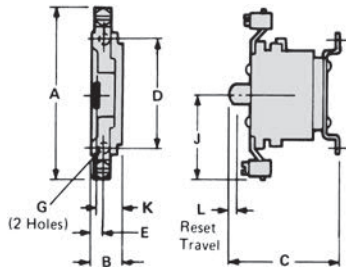


Figure 2

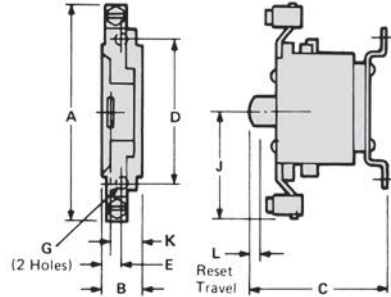


Figure 3

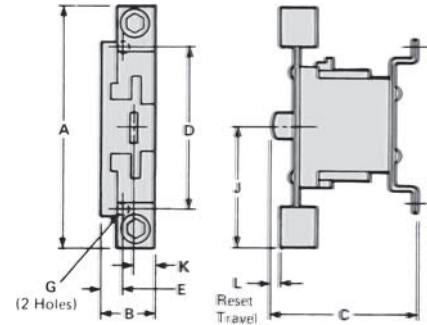


Figure 4

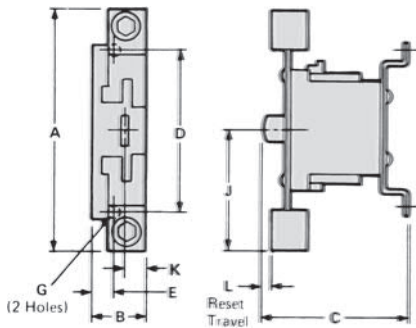


Figure 5

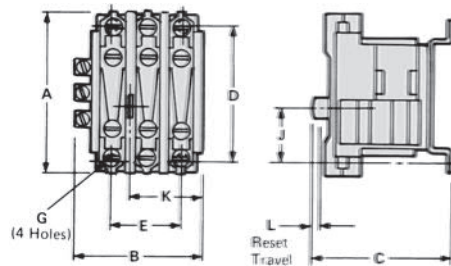


Figure 6

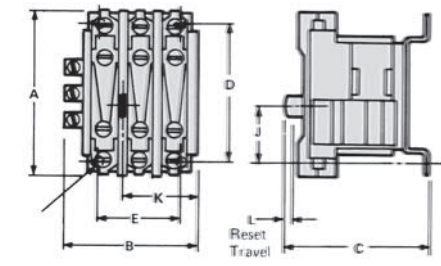


Figure 7

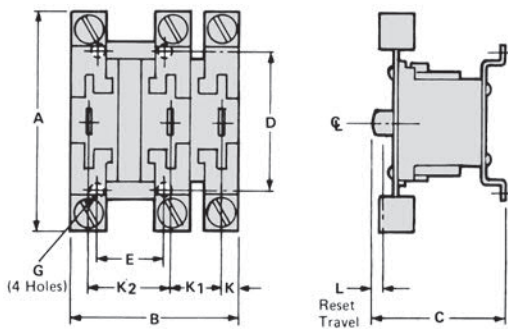
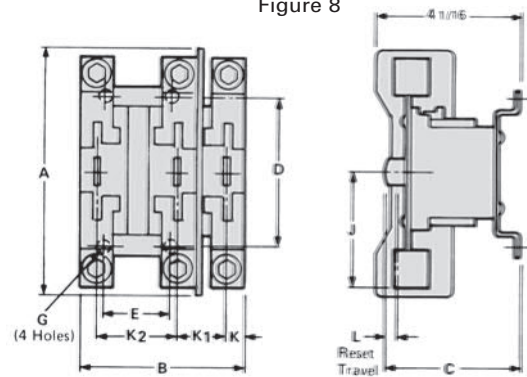


Figure 8



Description	Amp Rating	Fig	Outline Dimensions			Mounting Dimensions		Reset Dimensions			Mounting Screw G	Max Wire Size	Approx Ship Wt Lbs (Kg)	Ref Dwg
			A	B	C	D	E	J	K	L				
1-Pole Bimetal	25	1	3 1/2 (89)	7/8 (22)	3 3/16 (81)	3 (76)	1/2 (13)	1 3/4 (44)	3/4 (19)	1/8 (3)	#10	8	2 (1)	D51820
Bimetal	60	2	4 1/8 (124)	7/8 (22)	3 3/16 (81)	3 (76)	1/2 (13)	2 1/8 (52)	3/4 (19)	1/8 (3)	#10	1	2 (1)	D51830
Ambient	100	3	4 1/8 (124)	1 1/4 (32)	3 3/16 (90)	3 1/2 (89)	5/16 (14)	2 1/8 (52)	1/2 (13)	1/8 (3)	#10	00	3 (1)	D51833
Compensated	180	4	5 15/16 (151)	1 1/4 (32)	3 3/16 (90)	3 1/2 (89)	5/16 (14)	3 (76)	1/2 (13)	1/8 (3)	#10	250 MCM	4 (2)	D52206

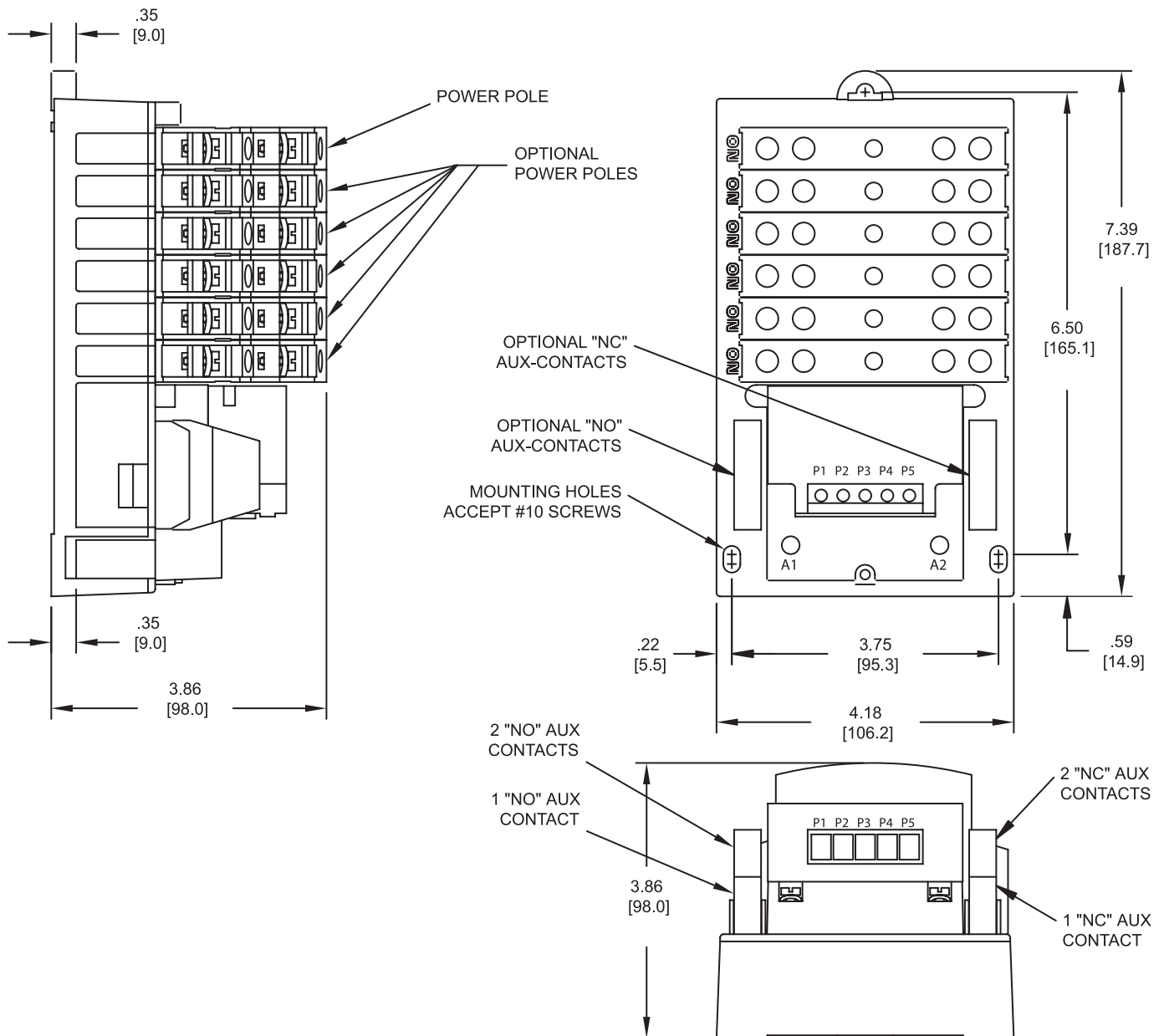
Description	Amp Rating	Fig	Outline Dimensions			Mounting Dimensions		Reset Dimensions					Mtg Screw G	Max Wire Size	Approx Ship Wt Lbs (Kg)	Ref Dwg
			A	B	C	D	E	J	K	K1	K2	L				
3-Pole Bimetal	30	5	3 3/8 (92)	3 1/8 (78)	3 3/8 (79)	3 (76)	1 1/2 (38)	1 1/4 (32)	1 13/16 (46)	—	—	3/16 (5)	#10	8	3 (1)	D54791
Bimetal	60	6	3 3/8 (98)	3 1/8 (78)	3 3/8 (79)	3 (76)	1 1/2 (38)	1 1/4 (32)	1 13/16 (46)	—	—	3/16 (5)	#10	2	3 (1)	D54823
Ambient	100	7	4 1/8 (124)	4 1/8 (113)	3 3/16 (90)	3 1/2 (89)	1 1/4 (41)	2 1/8 (62)	5/8 (14)	1 15/16 (49)	2 (51)	3/8 (3)	#10	00	4 (2)	D51868
Compensated	180	8	6 1/2 (165)	4 1/8 (113)	3 3/16 (90)	3 1/2 (89)	1 1/4 (41)	3 (76)	5/8 (14)	1 15/16 (49)	2 (51)	3/8 (3)	#10	250 MCM	5 (2)	D52038

Note: Dimensions for reference, not for construction.
Dimensions in inches (mm).

Lighting & Heating Contactors

Class LC Open Contactors

Dimensions



Note:

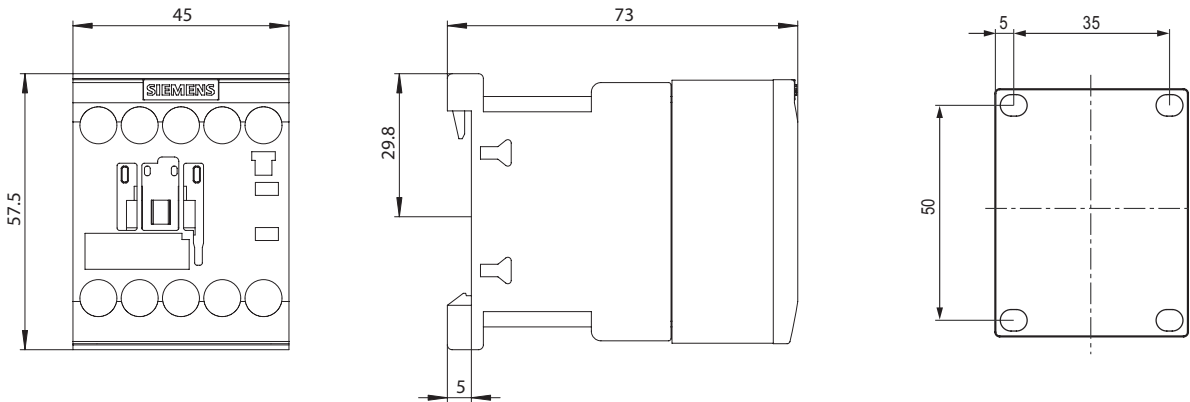
- 1) Mounting Dimensions remain the same for 1 to 12 Poles
- 2) Line and Load terminals are inter-changeable
- 3) Up to 2NO and 2NC auxiliary contacts can be added onto the base product
- 4) Same Power Pole can be configured as NO type or NC type

Lighting & Heating Contactors

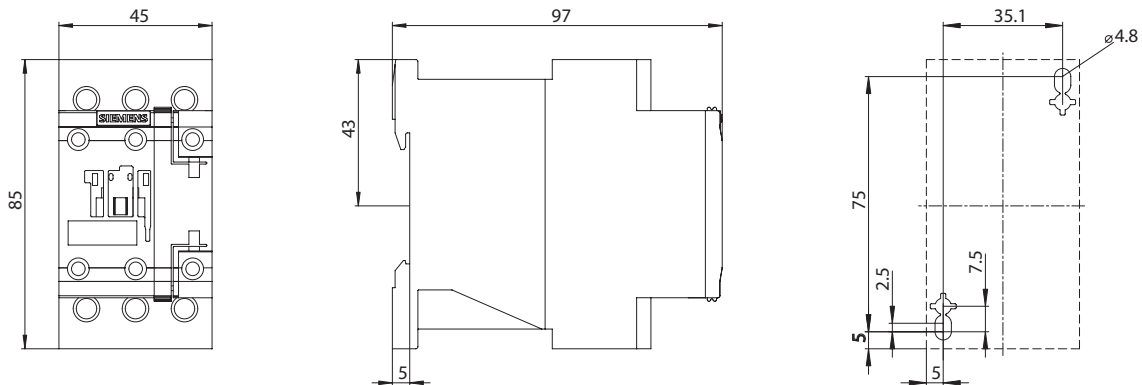
Open Contactors, Class LE

Dimensions

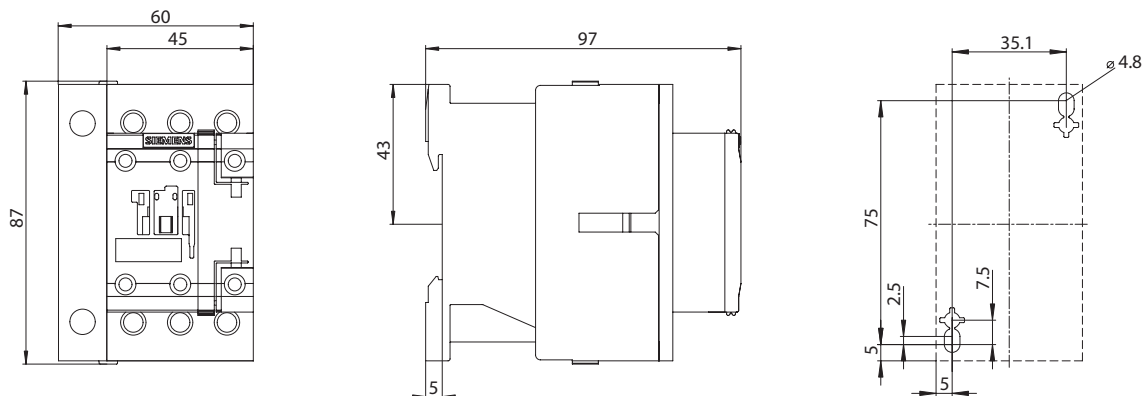
LEN00B (20A 3 Pole and 4 Pole)



LEN00C003 (30A 3 Pole)



LEN00C004 (30A 4 Pole)



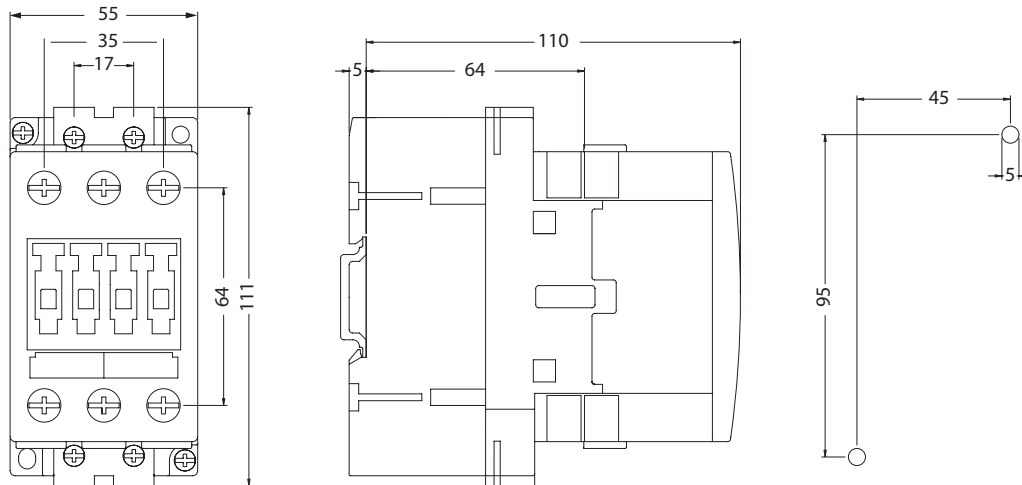
Lighting & Heating Contactors

Open Contactors, Class LE

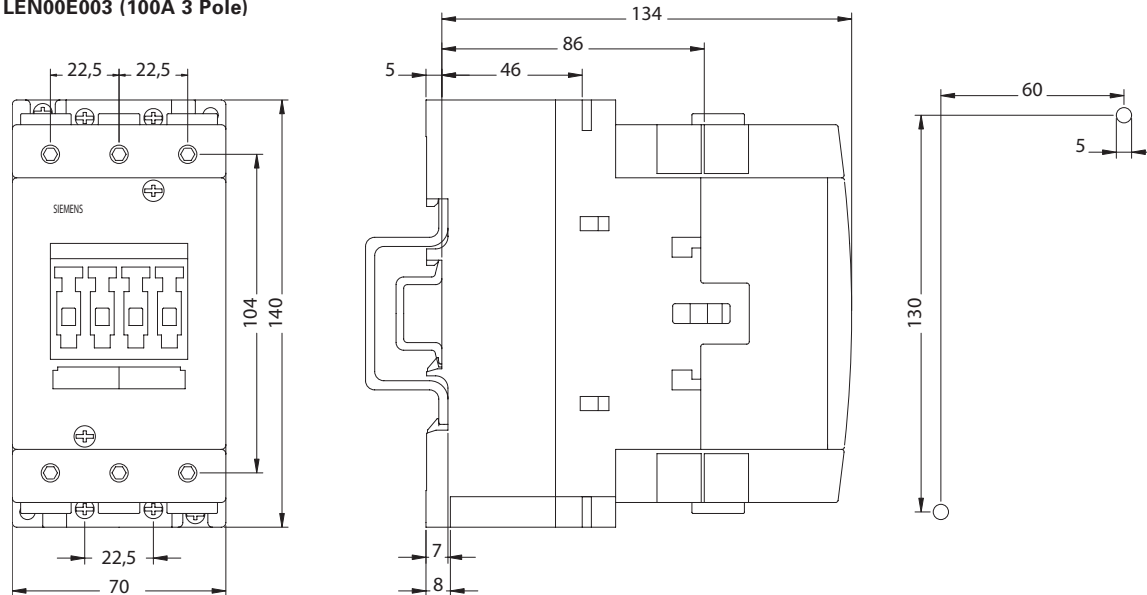
• Revised •
07/20/15

Dimensions

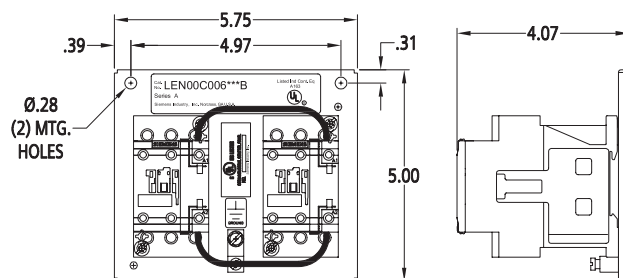
LEN00D003 (60A 3 Pole)



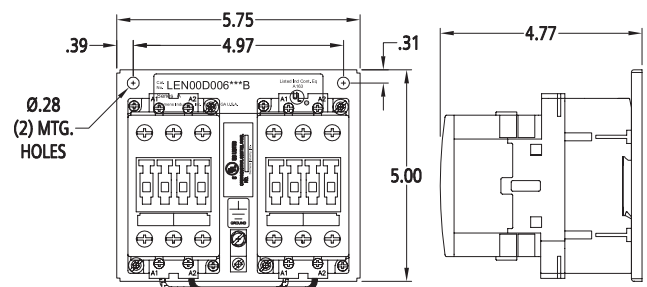
LEN00E003 (100A 3 Pole)



LEN00C006 (30A 6 Pole)



LEN00D006 (60A 6 Pole)



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Lighting & Heating Contactors

Open Contactors, Class LE

Dimensions

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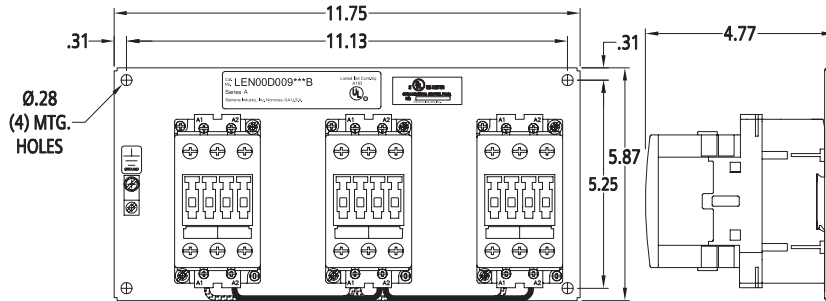
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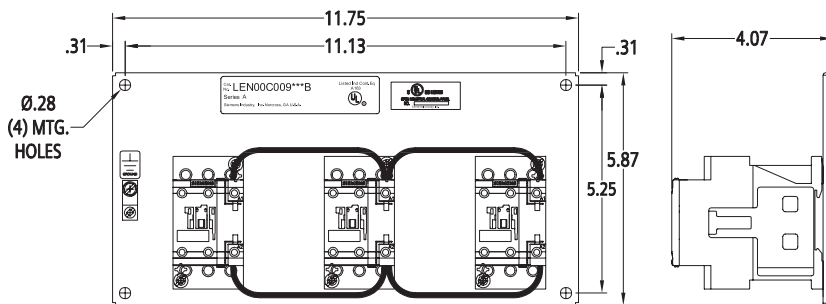
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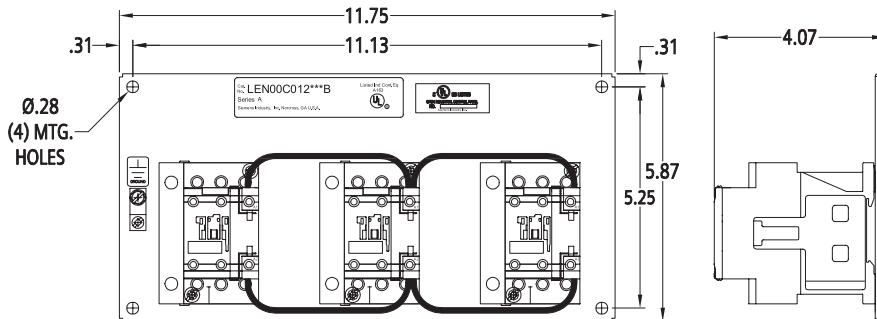
LEN00C009 (30A 9 Pole)



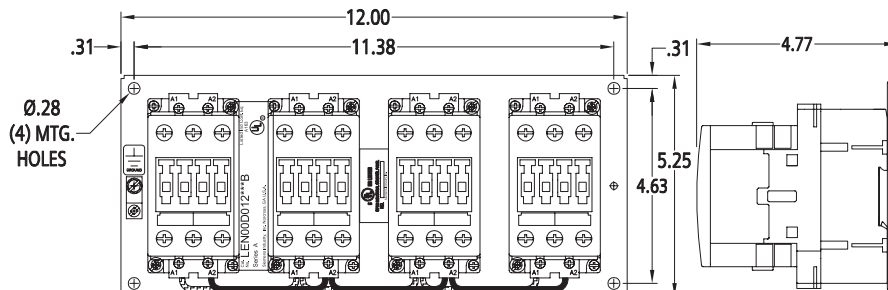
LEN00D009 (60A 9 Pole)



LEN00C012 (30A 12 Pole)



LEN00D012 (60A 12 Pole)

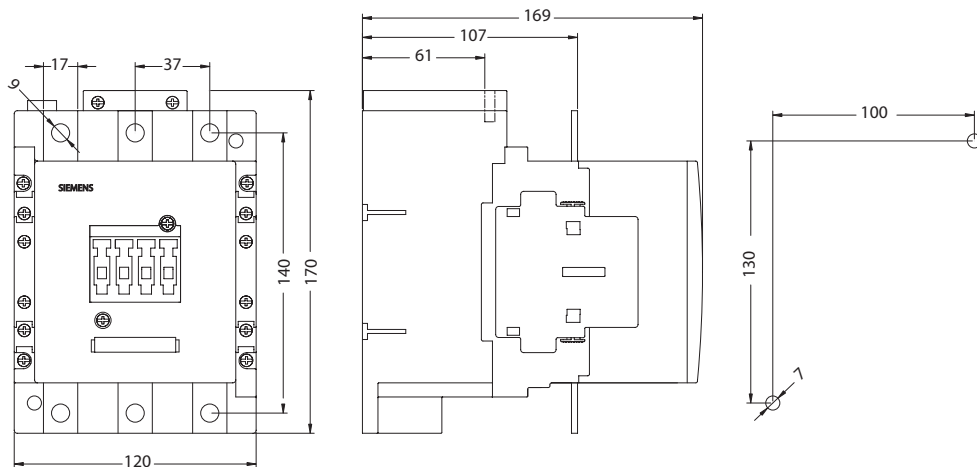


Lighting & Heating Contactors

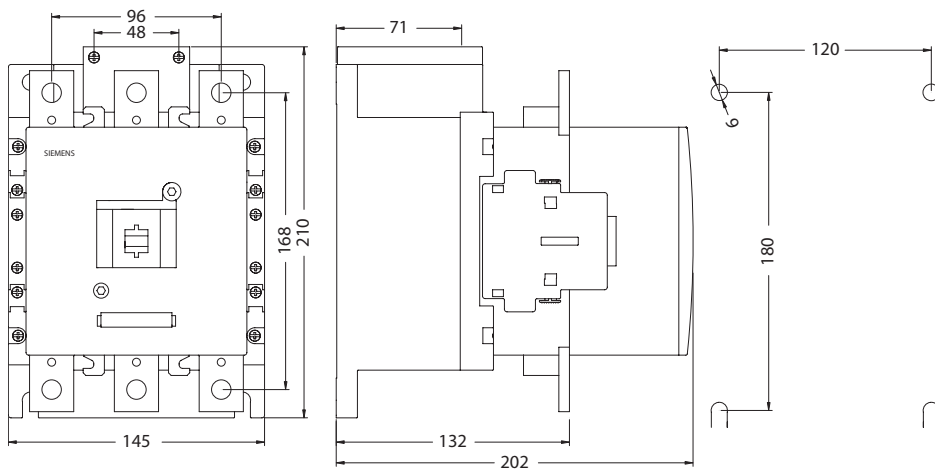
Open Contactors, Class LE

Dimensions

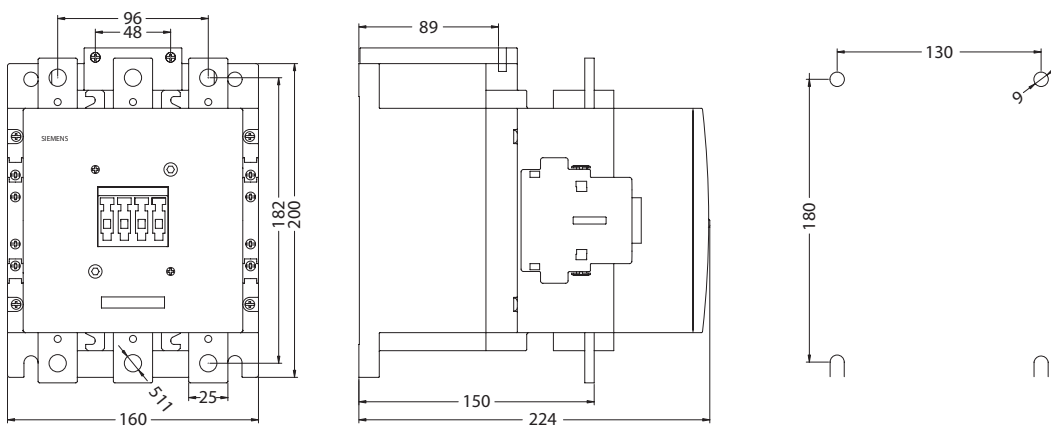
LEN00F003 (200A 3 Pole)



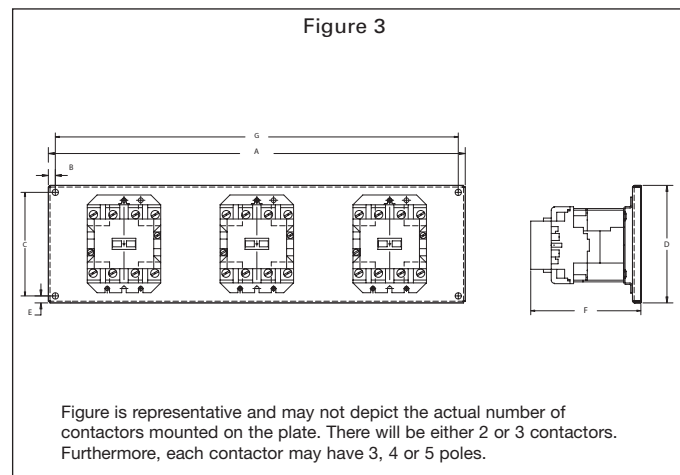
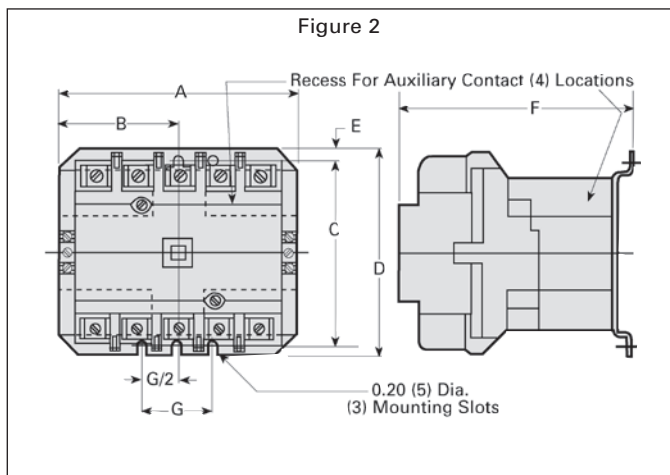
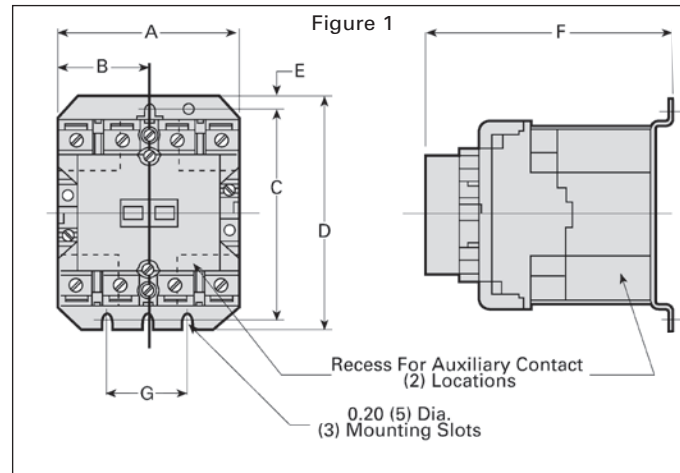
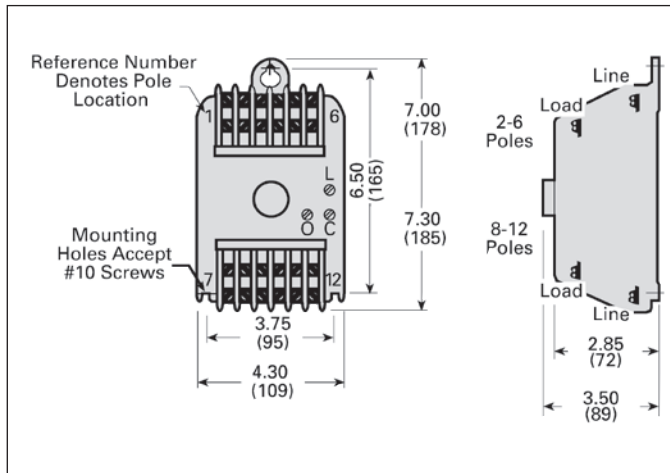
LEN00G003 (300A 3 Pole)



LEN00H003 (400A 3 Pole)



CLM Contactor, 20 Amp



Open Type Lighting and Heating Contactors

Class	Figure Number	Amp Rating	Number of Poles	A	B	C	D	E	F	G
CLM	1	30	2-4	3.31 (84)	1.65 (42)	3.95 (100)	4.38 (111)	0.23 (6)	4.61 (117)	1.50 (38)
		30	5	4.19 (106)	2.09 (53)	3.95 (100)	4.38 (111)	0.23 (6)	4.61 (117)	1.50 (38)
	2	60	2, 3	3.31 (84)	1.65 (42)	3.95 (100)	4.38 (111)	0.23 (6)	4.94 (125)	1.50 (38)
		60	4, 5	5.06 (129)	2.53 (64)	3.95 (100)	4.38 (111)	0.23 (6)	4.94 (125)	1.50 (38)
		100	2, 3	4.62 (117)	2.31 (59)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
		100	4, 5	7.25 (184)	3.62 (92)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
		200	2, 3	4.62 (117)	2.31 (59)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
		200	4, 5	7.25 (184)	3.62 (92)	6.00 (152)	6.62 (168)	0.38 (10)	6.75 (171)	1.88 (48)
	3	30	6, 8	8.00 (196)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	4.86 (119)	7.38 (181)
		30	9, 10, 12	11.75 (289)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	4.86 (119)	11.13 (273)
		60	6	8.00 (196)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	5.19 (127)	7.38 (181)
		60	8, 9, 10	11.75 (289)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	5.19 (127)	11.13 (273)
		60	12	16.75 (410)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	5.19 (127)	16.13 (395)
		60	12	16.75 (410)	0.31 (8)	5.25 (129)	5.87 (144)	0.31 (8)	5.19 (127)	16.13 (395)

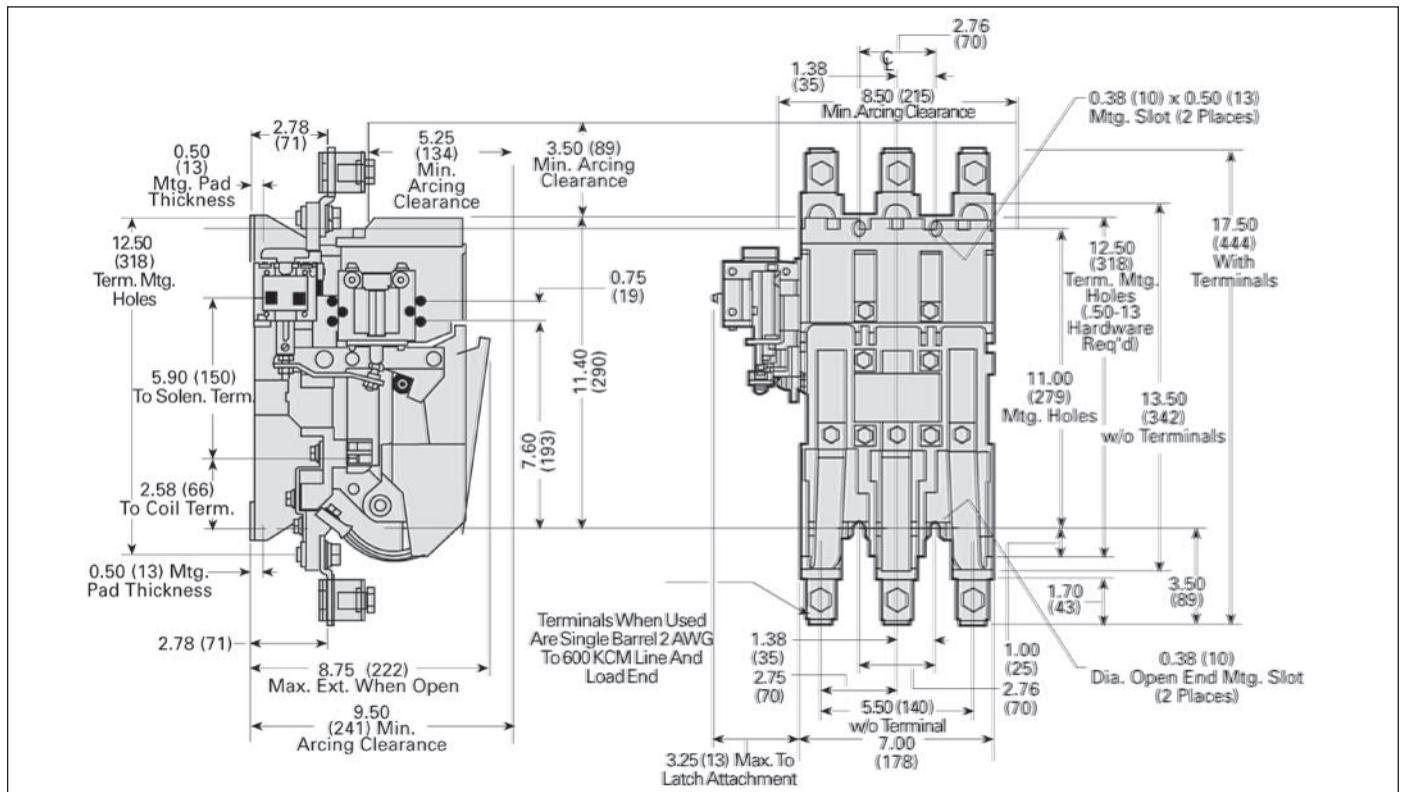
Note: Dimensions for reference, not for construction.
Dimensions in inches (mm).

Lighting Control

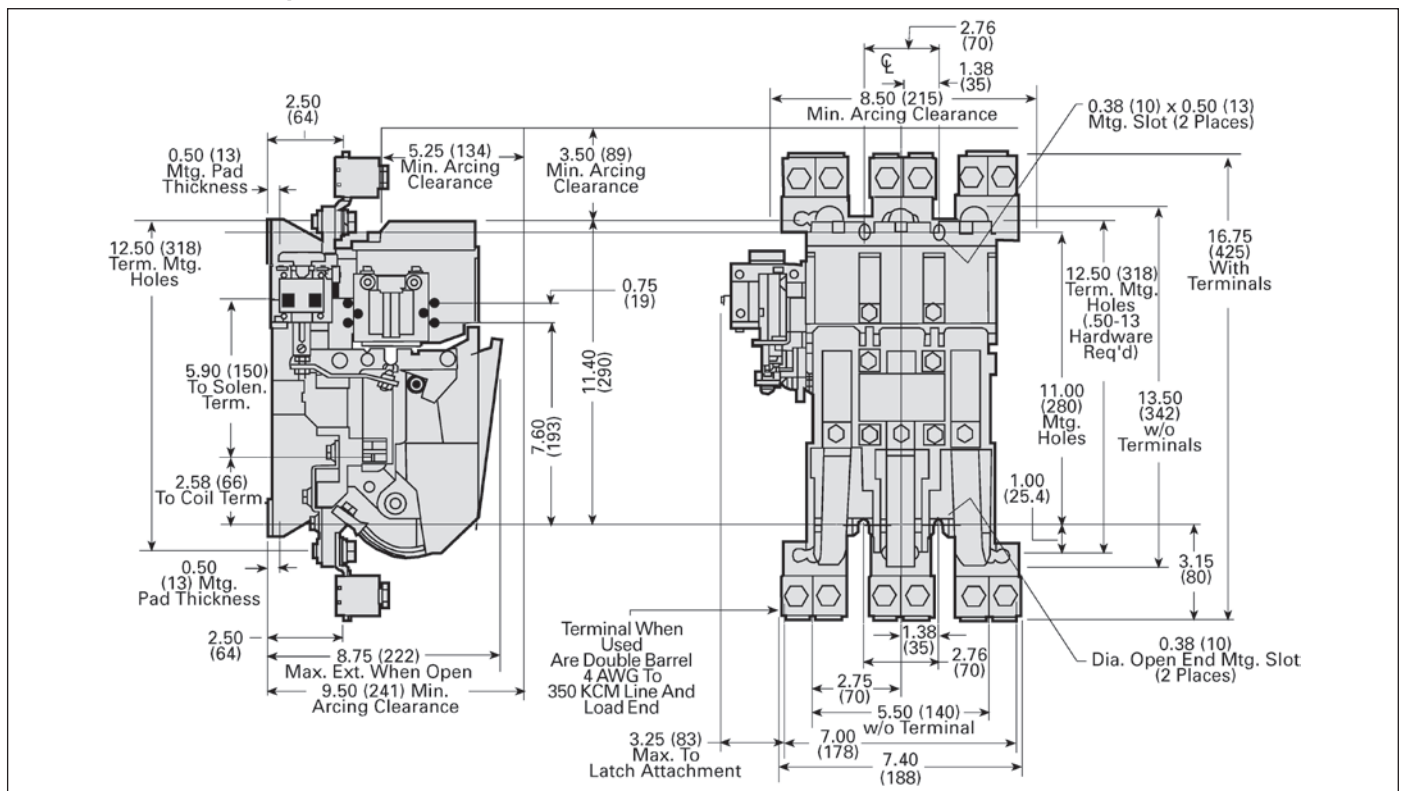
Mechanically Latched 300 and 400 Amps, Class CLM

Dimensions

CLM Contactors 300 Amp



CLM Contactors 400 Amp



Note: Dimensions for reference, not for construction.
Dimensions in inches (mm).

• Revised •
10/25/15

Industrial Control Power Transformers

Class MT

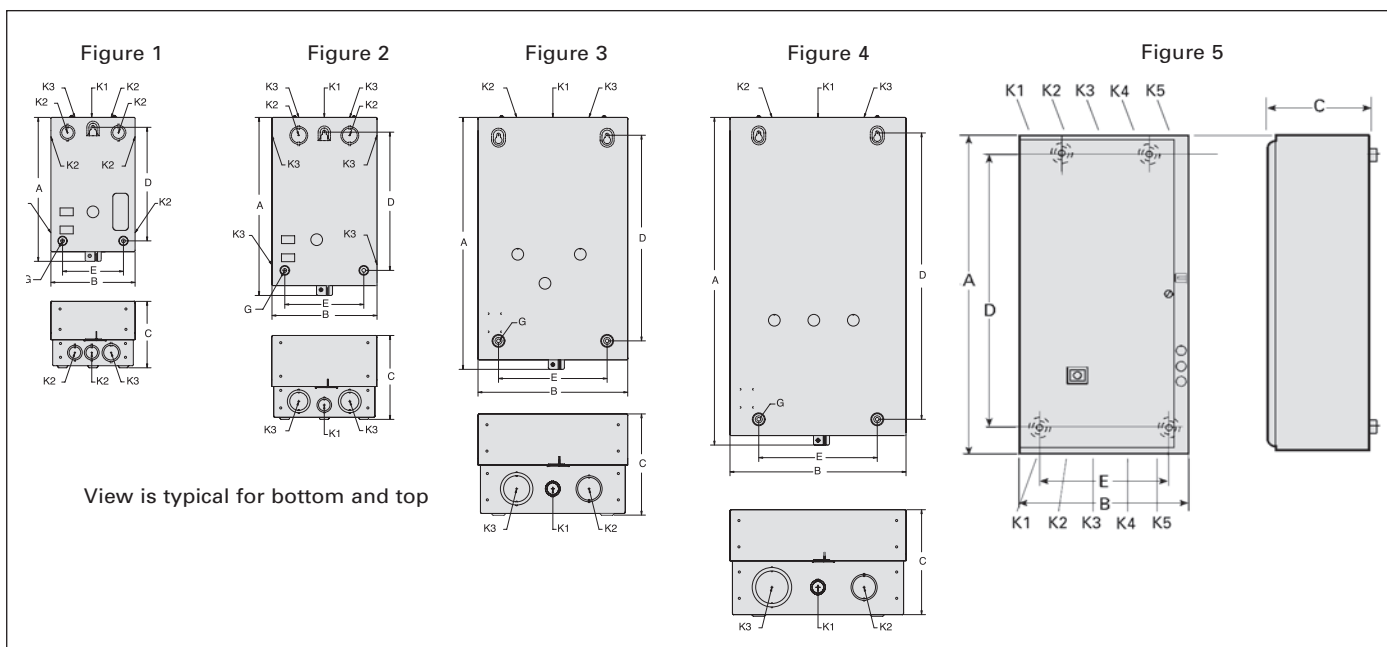
Dimensions

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For the latest CAD or PDF dimension drawings, look on our website at
[http://www.industry.usa.siemens.com/automation/us/en/industrial-controls/
products/control-circuit-components/control-power-transformers/
Pages/dimensional-drawings.aspx](http://www.industry.usa.siemens.com/automation/us/en/industrial-controls/products/control-circuit-components/control-power-transformers/Pages/dimensional-drawings.aspx)

Dimensions

For the latest CAD or PDF dimension drawings, look on our website at
[http://www.industry.usa.siemens.com/automation/us/en/industrial-controls/
products/control-circuit-components/control-power-transformers/
Pages/dimensional-drawings.aspx](http://www.industry.usa.siemens.com/automation/us/en/industrial-controls/products/control-circuit-components/control-power-transformers/Pages/dimensional-drawings.aspx)



NEMA 1 General Purpose Enclosure (Standard width for use with or without CPT)^①

Size	Max CPT Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs (Kg)	Ref Dwg
			A	B	C	D	E		K1	K2	K3	K4	K5		
00-1½	w/o CPT	1	10 ³ / ₂ (279)	6 ¹ / ₂ (163)	5 ¹ / ₂ (128)	8 ⁷ / ₂ (209)	4 ⁵ / ₈ (117)	¼	½	½-¾	¾-1	—	—	10 (5)	D68870
2-2½	w/o CPT	2	13 ¹ / ₂ (344)	7 ³ / ₂ (202)	6 ³ / ₈ (162)	10¼ (260)	6 (152)	¼	½-¾	¾-1	1-1¼	—	—	15 (7)	D68870
3-3½	(100VA)	3	19½ (486)	11½ (289)	7 ¹ / ₁₆ (195)	15½ (397)	8¼ (210)	¼	½-¾	1-1¼	1½-2	—	—	26 (12)	D68870
4	(300VA)	4	24½ (632)	13¾ (340)	8 ⁵ / ₈ (206)	21¼ (552)	9 (229)	¼	½-¾	1¼-1½	2-2½	—	—	37 (17)	D68870
5	(300VA)	5	40 (1016)	20 (508)	11 (279)	37½ (956)	15¼ (387)	¼	2-3	1¼-1½	½-¾	1¼-1½	2-3	135 (36)	D65608
6, 7	(300VA)	5	48 (1219)	20 (508)	12½ (317)	45½ (1148)	10 (254)	¼	2-2½	1¼-1½	½-¾	1¼-1½	2-2½	150 (44)	D65608013
8		5	79 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)							275 (125)	D56032006

NEMA 1 General Purpose Enclosure (Extra wide for use with CPT)^①

Size	Max CPT Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs (Kg)	Ref Dwg
			A	B	C	D	E		K1	K2	K3	K4	K5		
00-1½	(200VA)	3	19½ (486)	11½ (289)	7 ¹ / ₁₆ (195)	15½ (397)	8¼ (210)	¼	½-¾	1-1¼	1½-2	—	—	26 (12)	D68870
2-2½	(200VA)	3	19½ (486)	11½ (289)	7 ¹ / ₁₆ (195)	15½ (397)	8¼ (210)	¼	½-¾	1-1¼	1½-2	—	—	26 (12)	D68870
3-3½	(250VA)	4	24½ (632)	13¾ (340)	8 ⁵ / ₈ (206)	21¼ (552)	9 (229)	¼	½-¾	1-1¼-1½	2-2½	—	—	37 (17)	D68870

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

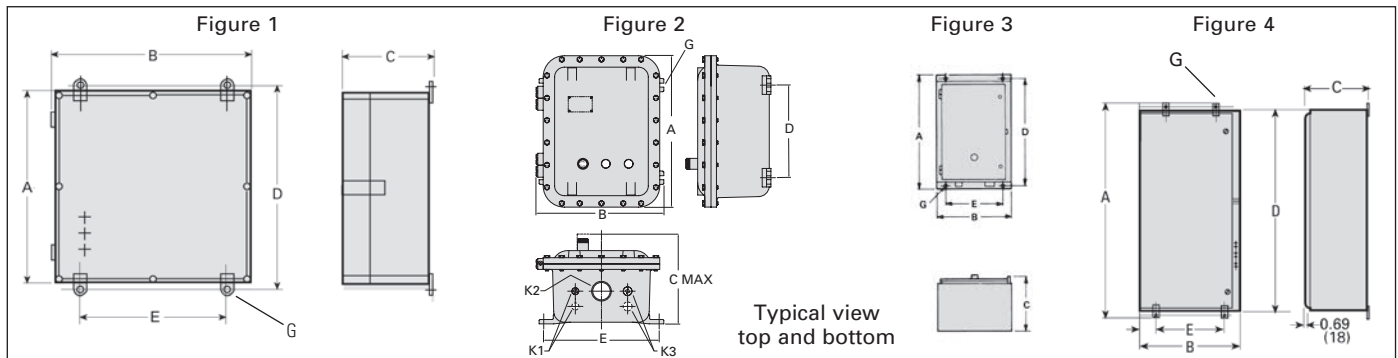
^① Clamshell enclosure Size 00 - 4; Standard width and Extra wide.

Heavy Duty Motor Starters & Contactors

Enclosed, Class 14, 40

• Revised •
07/20/15

Dimensions



NEMA 4X Fiberglass Enclosures (Standard width for use with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-2½	1	14.620 (371)	11.880 (302)	6.890 (175)	15.000 (381)	9.750 (248)	¼	—	—	—	11 (4.9)	24-139-861-001
3-4	1	23.780 (604)	23.780 (604)	6.890 (175)	24.125 (612.7)	21.250 (539.7)	¼	—	—	—	28 (12.7)	24-139-861-003

NEMA 7/9/3/4 Hazardous Location Enclosure (Standard width for use with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-1¼ w/o CPT	2	15.250 (387)	10.688 (272)	10.000 (254)	8.500 (216)	9.125 (132)	¾	½	1½	¾	33 (14.9)	24-139-865-002
2-2½ (0-1¼ w/ CPT)	2	17.750 (451)	14.688 (373)	10.375 (264)	10.625 (270)	13.250 (337)	¾	½	2	¾	60 (27.0)	24-139-865-003
3	2	17.750 (451)	14.688 (373)	10.375 (264)	10.625 (270)	13.250 (337)	¾	½	2	¾	60 (27.0)	24-139-865-003
3½-4	2	28.688 (729)	17.750 (451)	11.750 (298)	18.375 (467)	15.750 (400)	½	½	3	¾	140 (63.5)	24-139-865-004
5	2	48.875 (1038)	22.875 (581)	14 7/8 (377)	29 (373)	21½ (533)	¾	½	3	¾	352 (159)	24-139-865-006

NEMA 7/9/3/4 Hazardous Location Enclosure (Extra wide for use with CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-2½ ^①	2	17.750 (451)	14.688 (373)	10.375 (264)	10.625 (270)	13.250 (337)	¾	½	2	¾	60 (27.0)	24-139-865-003

NEMA 12/3/3R Industrial Use Enclosure (Standard width for use without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-1¼	3	13.000 (330)	7.750 (197)	5.438 (138)	12.250 (311)	5.000 (127)	¼	—	—	—	12 (5)	D41547
2-2½	3	16.000 (406)	8.125 (206)	6.063 (154)	15.250 (387)	5.000 (127)	¼	—	—	—	18 (8)	D41547
3-4	3	26.000 (660)	13.125 (333)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	49 (22)	D41552

NEMA 12/3/3R Industrial Use Enclosure (Extra wide for use with CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-1¼	3	13.000 (330)	12.625 (321)	5.375 (137)	12.250 (311)	10.000 (254)	¼	—	—	—	30 (14)	D17150
2-2 ½	3	16.000 (406)	13.250 (337)	6.125 (156)	15.250 (387)	11.000 (279)	¼	—	—	—	33 (15)	D17150
3-3 ½	3	26.000 (660)	13.125 (333)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	49 (22)	D41552
4	3	29.063 (738)	23.188 (589)	9.250 (235)	27.563 (700)	20.000 (508)	¾	—	—	—	64 (29)	D17150
5	4	40.000 (1016)	20.000 (508)	11.000 (279)	41.000 (1041)	10.000 (254)	¾	—	—	—		D65608007
6, 7	4	48.000 (1219)	20.000 (508)	12.500 (317)	49.000 (1244)	10.000 (254)	¾	—	—	—		D65608009
8	5	79.000 (2010)	22.000 (559)	13.000 (330)	78.000 (1981)	18.000 (457)	¾	—	—	—	275 (125)	D65632006

NEMA 4/4X Stainless Steel Enclosure (Standard width for use without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-1¼	3	13.000 (330)	7.750 (197)	5.438 (138)	12.250 (311)	5.000 (127)	¼	—	—	—	17.5 (8)	D41546
2-2½	3	16.000 (406)	8.125 (206)	6.063 (154)	15.250 (387)	5.000 (127)	¼	—	—	—	36 (16)	D41546
3-4	3	26.000 (660)	13.125 (333)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	67 (30)	D41551

NEMA 4/4X Stainless Steel Enclosure (Extra wide for use with CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-1¼	3	13.000 (330)	12.625 (321)	5.375 (137)	12.250 (311)	10.000 (254)	¼	—	—	—	30 (14)	D41917
2-2½	3	16.000 (406)	13.250 (337)	6.000 (152)	15.250 (387)	11.000 (279)	¼	—	—	—	33 (15)	D42935
3-3½	3	26.000 (660)	18.000 (457)	7.563 (192)	25.250 (641)	10.000 (254)	¼	—	—	—	67 (30)	D41551
4	3	29.000 (737)	23.188 (589)	9.250 (235)	27.500 (699)	20.000 (508)	¾	—	—	—	64 (29)	D43292
5 (Painted)	4	40.000 (1016)	20.000 (508)	11.000 (279)	41.000 (1041)	10.000 (254)	¾	—	—	—		D65608007
6, 7 (Painted)	4	48.000 (1219)	20.000 (508)	12.500 (317)	49.000 (1244)	10.000 (254)	¾	—	—	—		D65608009
8 (Painted)	5	79.000 (2010)	22.000 (559)	13.000 (330)	78.000 (1981)	18.000 (457)	¾	—	—	—	275 (125)	D65632006

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

① Used for addition of only CPT on size 2½. If pilot devices are needed, use size 3-3½ enclosure.

Combination Heavy Duty Starters

Enclosed, Class 17, 18

Dimensions

Figure 1

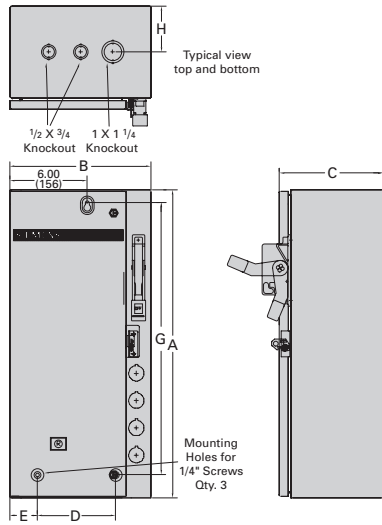


Figure 2

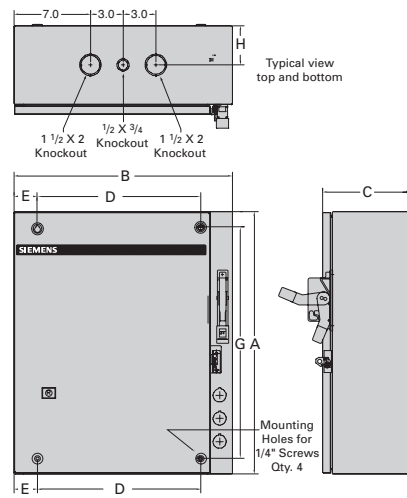


Figure 3

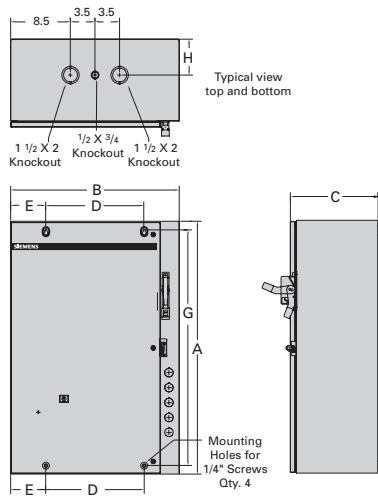
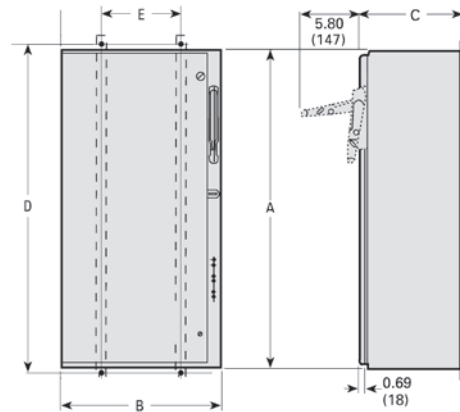


Figure 4



NEMA 1 Standard Width 0-6

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	1	24 (610)	11 (279)	8 (203)	6.125 (156)	2.125 (54)	21.00 (533)	3.50 (90)	35 (16)	D68774001
2 1/2, 3 (except 200A Disc)	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	48 (22)	D68774002
3 (200A Disc.), 3 1/2, 4	3	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	5.00 (127)	101 (46)	D68774003
5	4	72.156 (1833)	20 (508)	11.031 (280)	71 (1803)	16 (406)	—	—	250 (113)	D56032005
6	4	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

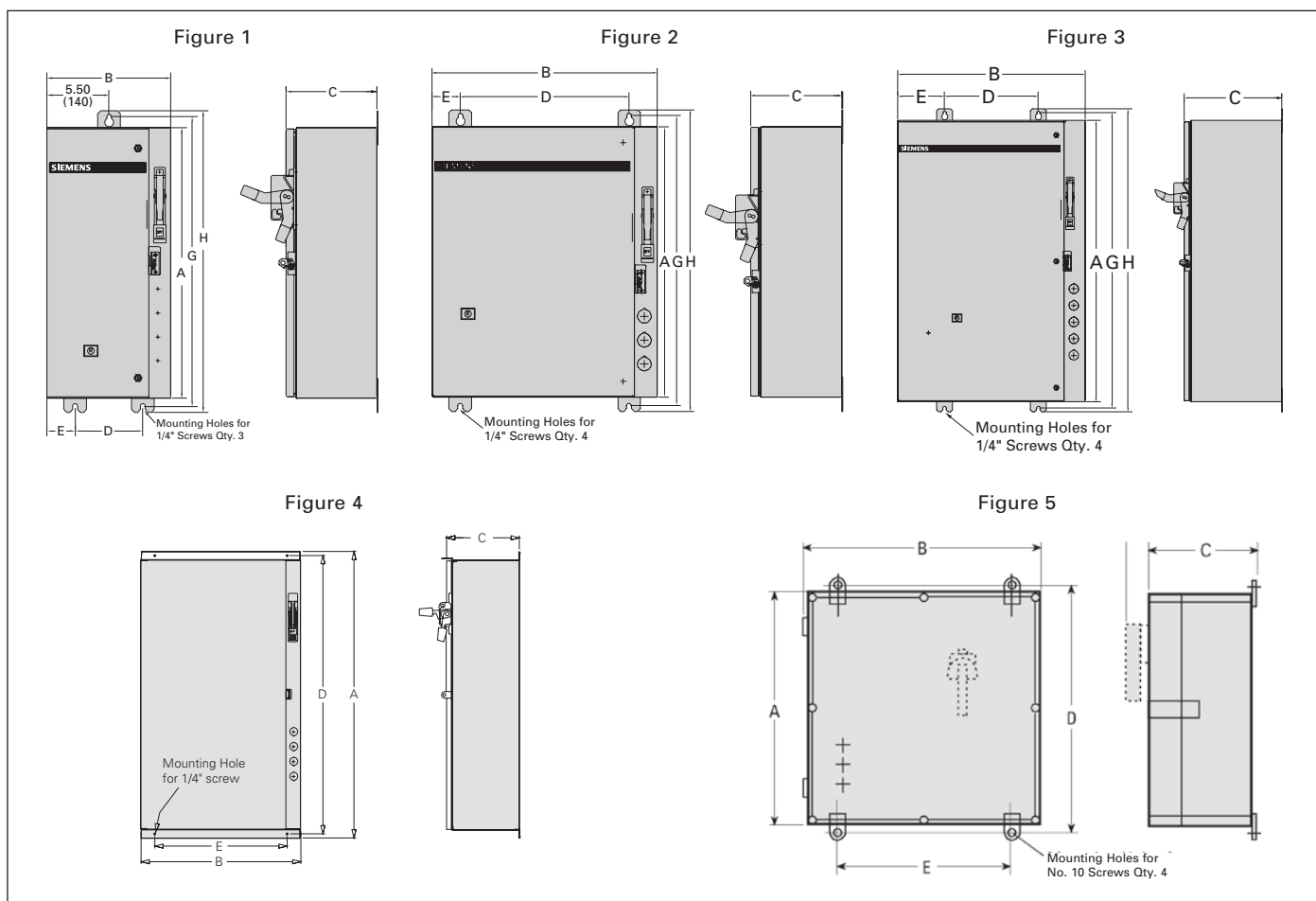
NEMA 1 Extra Wide 0-3

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	48 (22)	D68774002
2 1/2, 3	3	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	5.00 (127)	101 (46)	D68774003

Combination Heavy Duty Starters

Enclosed, Class 17, 18

Dimensions



NEMA 12/3/3R/4 (Painted), 4/4X (Stainless) Standard Width 0-6

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	1	24 (610)	11 (279)	8 (203)	6.00 (152)	2.50 (64)	25.75 (654)	26.75 (680)	35 (16)	D56033
2 1/2, 3 (except 200A Disc)	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (680)	48 (22)	D56033
3 (200A Disc.), 3 1/2, 4	3	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	101 (46)	D56033
5 (Painted)	4	72.156 (1833)	20 (508)	11.031 (280)	71 (1830)	16 (406)	—	—	250 (113)	D56032005
6 (Painted)	4	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

NEMA 12/3/3R/4 (Painted), 4/4X (Stainless) Extra Wide 0-3

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2	2	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (654)	49 (22)	D56033
2 1/2, 3	3	36 (914)	24 (610)	8 (203)	12.00 (305)	6.00 (152)	37.75 (959)	38.75 (984)	102 (46)	D56033

NEMA 4X Fiberglass Standard Width 0-4

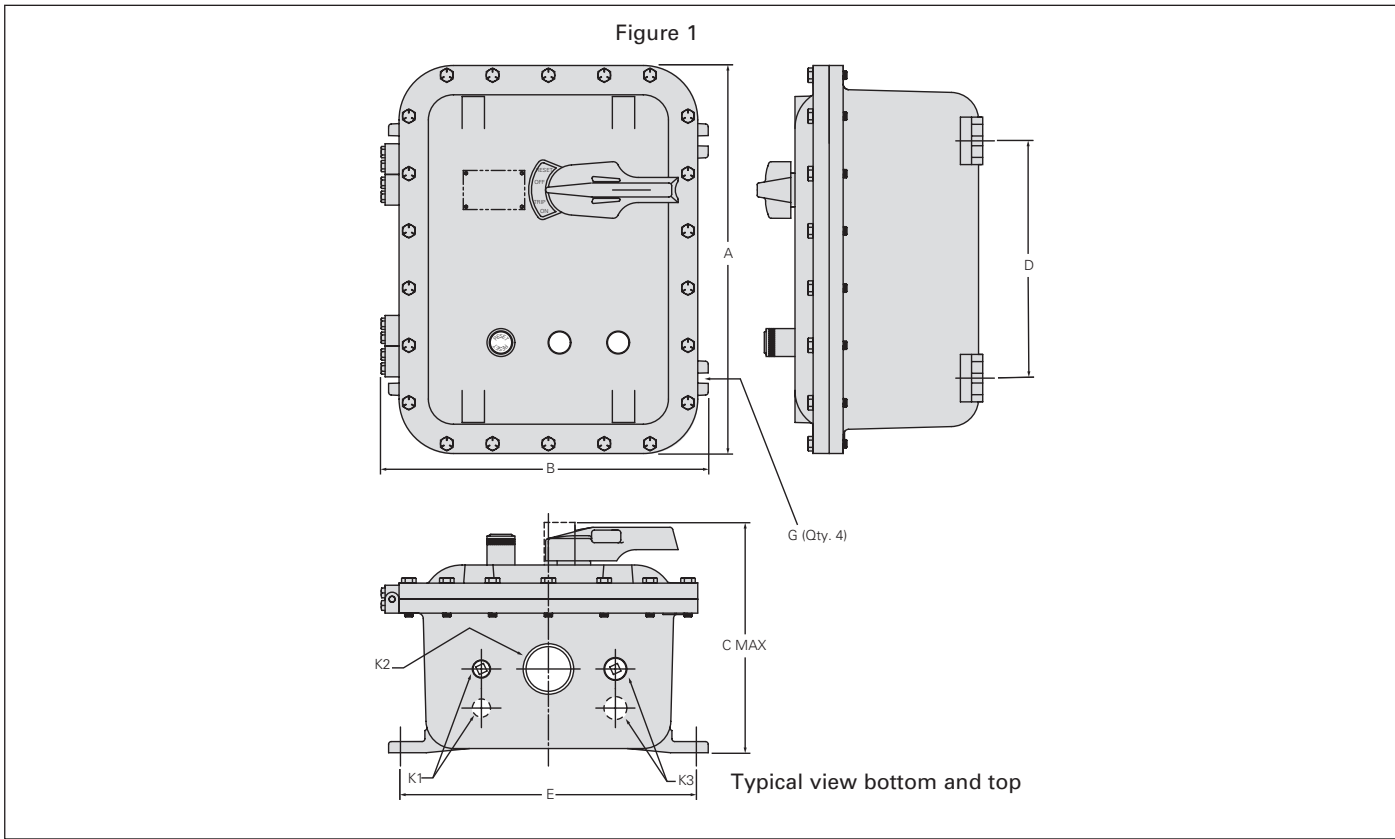
Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-1 1/4	5	23.75 (603)	14.62 (371)	7.12 (181)	24.09 (612)	12.20 (310)	—	—	42 (19)	—
2-3 1/2	5	23.75 (603)	23.75 (603)	8.50 (216)	24.06 (611)	21.30 (541)	—	—	44 (20)	—
4	5	39.37 (1000)	29.52 (750)	12.20 (310)	40.94 (1040)	27.95 (710)	—	—	55 (25)	—

Note: Dimensions in inches (mm).
Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.

Combination Heavy Duty Starters

Enclosed, Class 18

Dimensions



NEMA 7 & 9, 3, 4 Standard Width 0-4

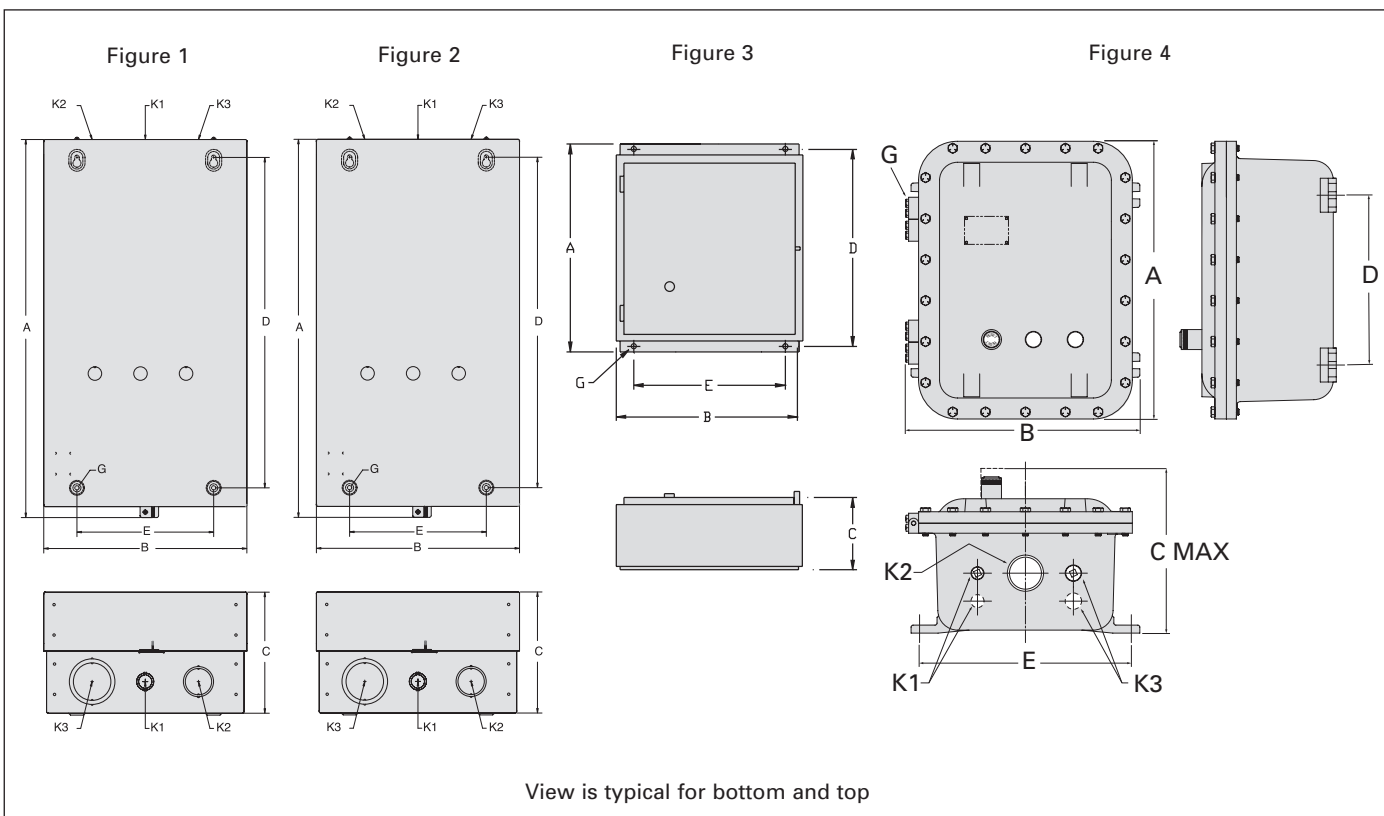
Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-1 $\frac{3}{4}$	1	17.38 (441)	14.69 (373)	10.38 (264)	10.63 (270)	13.25 (337)	$\frac{3}{8}$	$\frac{3}{4}$	2	$\frac{1}{2}$	60 (27)	24-139-865-003
2-3 $\frac{1}{2}$	1	28.25 (718)	17.75 (451)	11.19 (284)	18.38 (467)	15.75 (400)	$\frac{3}{8}$	$\frac{3}{4}$	2 $\frac{1}{2}$	$\frac{1}{2}$	160 (72)	24-139-865-004
4	1	32.25 (819)	20.00 (508)	11.50 (292)	22.50 (572)	17.75 (451)	$\frac{5}{8}$	$\frac{3}{4}$	2 $\frac{1}{2}$	$\frac{1}{2}$	250 (113)	24-139-865-005
5	1	40.875 (1038)	22.875 (581)	14.875 (378)	29 (737)	21.75 (552)	$\frac{5}{8}$	$\frac{1}{2}$	3	$\frac{3}{4}$	360 (163)	—

Note: Dimensions in inches (mm). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

Reversing Heavy Duty Starters & Contactors

Enclosed, Class 22, 43

Dimensions



NEMA 1 General Purpose Enclosure (Standard width for use with and without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mounting Screw	Conduit Size				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	K1	K2	K3	K4		
00-2½ (200 VA)	1	19⅞ (486)	11⅞ (289)	7⅞ (195)	15⅞ (397)	8¼ (210)	¼	½-¾	1-1¼	1½-2	—	30 (14)	D68870
3-4 (300 VA)	2	24⅞ (632)	13⅞ (340)	8⅞ (206)	21⅞ (552)	9 (229)	¼	½-¾	1¼-1½	2-2½	—	52 (24)	D68870
5 (300 VA)		40 (1016)	20 (508)	11 (279)	37⅞ (956)	15¼ (387)	¼	2-3	1¼-1½	½-¾	1¼-1½	135 (36)	D65608
6, 7 (300 VA)		48 (1219)	20 (508)	12½ (317)	45⅞ (1148)	10 (254)	¼	2-2½	1¼-1½	½-¾	1¼-1½	150 (44)	D65608013

NEMA 4/4X Stainless Steel Enclosure (with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	K1	K2	K3		
0-1¼	3	13 (330)	12⅞ (321)	5⅞ (137)	12¼ (311)	10 (254)	¼	—	—	—	30 (14)	D41917
2-2½	3	16 (406)	13¼ (337)	6 (152)	15¼ (387)	11 (279)	¼	—	—	—	33 (15)	D42935
3-3½ (w/o CPT)	3	25⅞ (637)	17⅞ (437)	7⅞ (187)	24⅞ (618)	14 (356)	¼	—	—	—	53 (24)	D17423
3-3½ (w/ CPT)	3	29 (737)	23⅞ (589)	9¼ (235)	27⅞ (699)	20 (508)	⅝	—	—	—	64 (29)	D43292
4												
5 (Painted)		40 (1016)	20 (508)	11 (279)	41 (1041)	10 (254)	⅝	—	—	—		D65608007
6, 7 (Painted)		48 (1219)	20 (508)	12½ (317)	49 (1244)	10 (254)	⅝	—	—	—		65608009

NEMA 7/9/3/4 Hazardous Location Enclosure (with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	K1	K2	K3		
0-2½	4	28¼ (718)	16¼ (413)	9¼ (235)	18¼ (467)	15¼ (400)	½	½	3	¾	140	24-139-865-004
3-4	4	32¼ (819)	18¼ (464)	9⅞ (243)	22½ (572)	17¼ (451)	½	½	3	¾	150	24-139-865-005

Note: Dimensions in inches (mm).
Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.

Figure 5

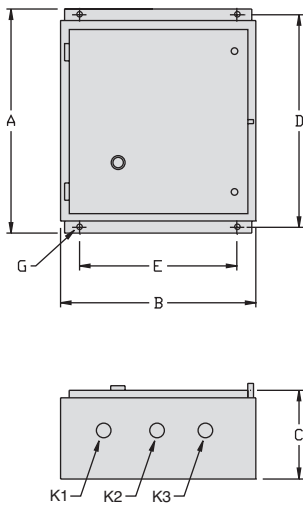


Figure 6

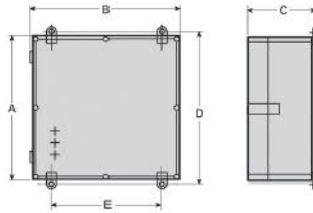
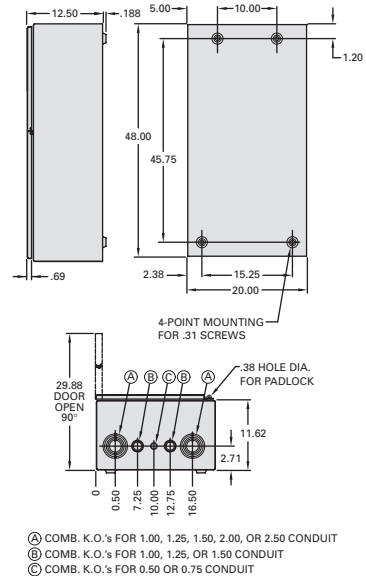


Figure 7



View is typical for bottom and top

NEMA 12/3/3R Industrial Use Enclosure (with or without CPT)

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-1 1/4	5	13 (330)	12 5/8 (321)	5 1/8 (137)	12 1/4 (311)	10 (254)	1/4	—	—	—	30 (14)	D17150
2-2 1/2	5	16 (406)	13 1/4 (337)	6 1/8 (156)	15 1/4 (387)	11 (279)	1/4	—	—	—	33 (15)	D17150
3-3 1/2 (w/o CPT)	5	25 1/16 (637)	17 9/16 (437)	7 5/8 (187)	24 3/16 (618)	14 (356)	1/4	—	—	—	53 (24)	D17150
3-3 1/2 (w/ CPT)	5	29 1/16 (738)	23 3/16 (589)	9 1/4 (235)	27 9/16 (700)	20 (508)	5/16	—	—	—	64 (29)	D17150
4	5	40 (1016)	20 (508)	11 (279)	41 (1041)	10 (254)	3/8	—	—	—	—	D65608007
6 (300 VA CPT max.)	7	48 (1219)	20 (508)	12 1/2 (318)	45 1/4 (1162)	10 (254)	1/4	—	—	—	—	—

NEMA 4X Fiberglass Enclosure (with or without CPT)

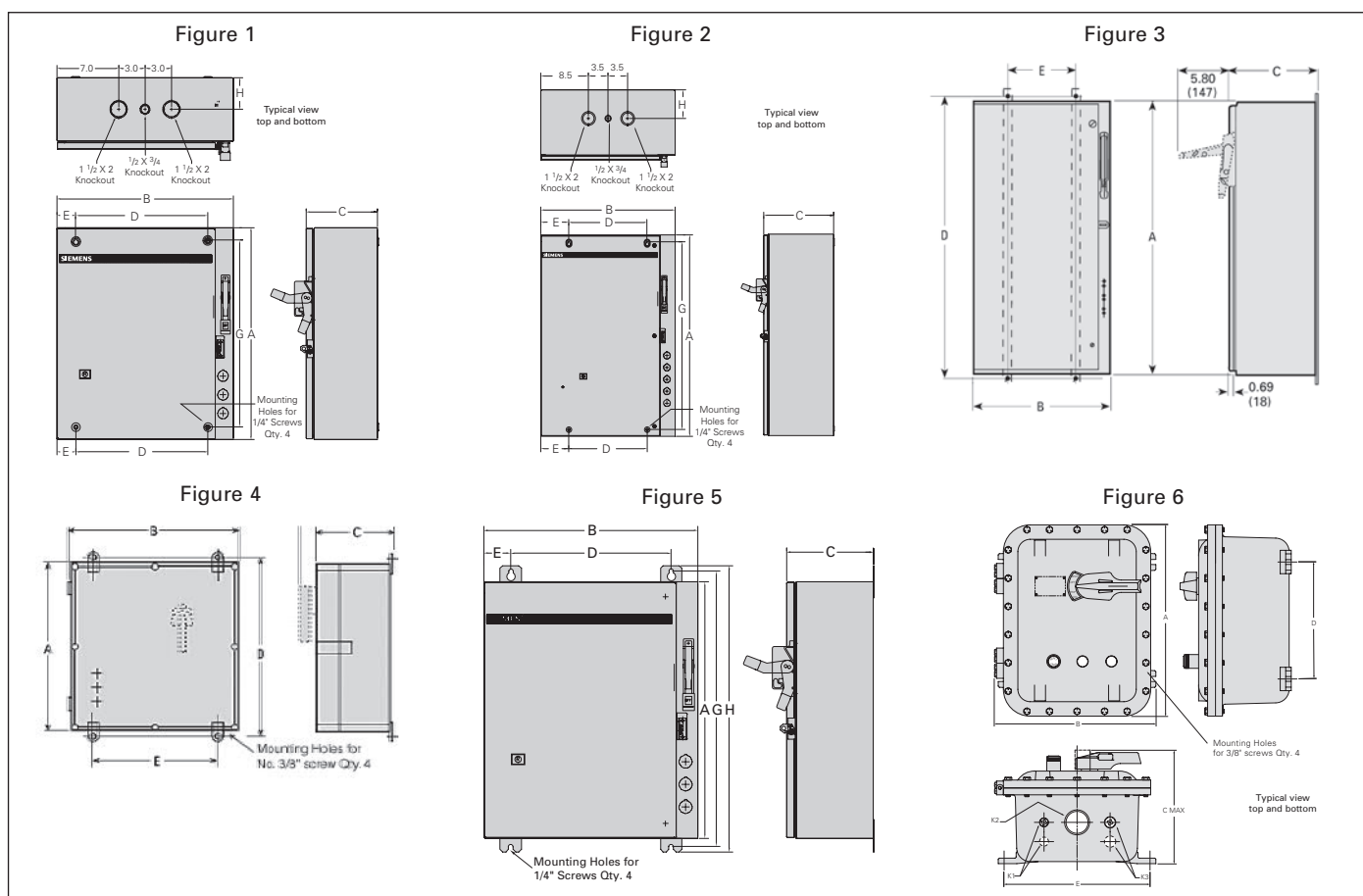
Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-2 1/2	6	23.78 (604)	14.68 (373)	6.89 (175)	22 1/2 (579)	13 3/8 (351)	1/4	—	—	—	35	—
3-4	6	23.78 (604)	23.78 (604)	6.89 (175)	22 1/2 (579)	22 1/2 (579)	1/4	—	—	—	38	—

Note: Dimensions in inches (mm).
Dimensions for reference, not for construction.
Contact sales office for dimensions not listed.

Combination Reversing Heavy Duty Starters

Enclosed, Class 25, 26

Dimensions



NEMA 1 Standard Width 0-6

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2½	1	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	60 (27)	D68774002
3-4	2	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	5.00 (127)	121 (55)	D68774003
5 (Painted)	3	72.156 (1833)	20 (508)	11.031 (280)	71 (1803)	16 (406)	—	—	250 (113)	D56032005
6 (Painted)	3	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

NEMA 12/3/3R/4 (Painted), 4/4X (Stainless) Standard Width 0-6

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-2½	5	24 (610)	20 (508)	8 (203)	15.00 (381)	3.50 (90)	25.75 (654)	26.75 (654)	63 (29)	D68774005
3-4	5	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	124 (56)	D68774006
5 (Painted)	3	72.156 (1833)	20 (508)	11.031 (280)	71 (1803)	16 (406)	—	—	250 (113)	D56032005
6 (Painted)	3	79.125 (2010)	22 (559)	13 (330)	78 (1981)	18 (457)	—	—	275 (125)	D56032006

NEMA 4X Fiberglass 0-4

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-2½	4	23.780 (604)	14.680 (373)	6.890 (175)	24.125 (612.7)	12.250 (311)	¾	—	—	—	18 (8)	24-139-861-001
3-4	4	23.780 (604)	23.780 (604)	6.890 (175)	24.125 (612.7)	21.250 (539.7)	¾	—	—	—	28 (12.7)	24-139-861-003

NEMA 7/9/3/4 Hazardous Location 0-4

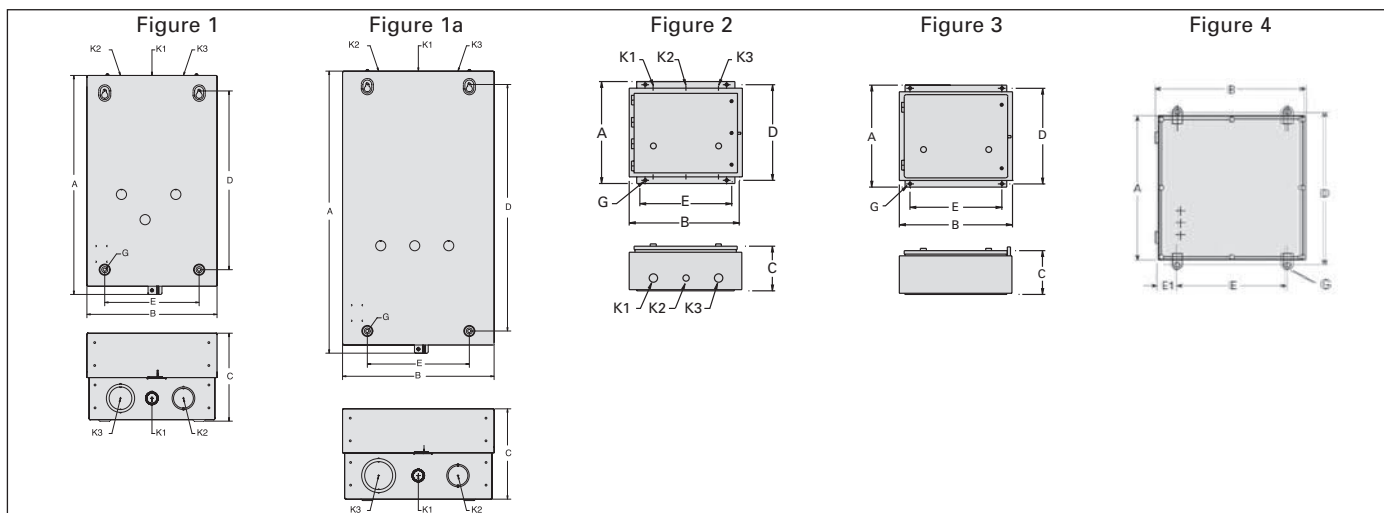
Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-2½	6	28.688 (729)	17.750 (451)	11.750 (298)	18.375 (467)	15.750 (400)	¾	½	3	¾	140 (63.5)	24-139-865-004
3-4												

Note: Dimensions in inches (mm).
 Dimensions for reference, not for construction.
 Contact sales office for dimensions not listed.

Two Speed Heavy Duty Starters

Enclosed, Class 30

Dimensions



2 Speed 1 Winding

NEMA 1 General Purpose Enclosure (Standard width for use with or without CPT)													
Size	Fig	Outline Dimensions			Mounting Dimensions			Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G		K1	K2	K3		
0-1 ¾ w/o CPT	1	19 ⅞ (486)	11 ⅜ (289)	7 ⅞ (195)	15 ⅝ (397)	8 ¼ (210)	¼	½-¾	1-1¼	1 ½-2	26 (12)	D68870	
0-1 ¾ (200 VA)	1a	24 ⅞ (632)	13 ⅜ (340)	8 ⅞ (206)	21 ¾ (552)	9 (229)	¼	½-¾	1¼-1 ½	2-2 ½	52 (24)	D68870	
2-2 ½	2	16 (406)	17.13 (435)	7.63 (194)	15.25 (387)	14 (355)	¼	½-¾	1¼-1 ½	1 ¼-1 ½	39 (20)	D42932001	
3-3 ½	2	18.31 (465)	21.19 (538)	7.38 (187)	17.56 (446)	18 (457)	¼	1¼-1 ½	½-¾	1 ½-2	60 (27)	D72956002	
4	3	29 (737)	23 ⅜ (589)	9 ¼ (235)	27 ½ (699)	20 (508)	⅝	—	—	—	61 (28)	D43292001	
NEMA 4/4X Stainless Steel Enclosure (Standard width for use with or without CPT)													
0-1 ¾ w/o CPT	3	13 (330)	12 ⅞ (321)	5 ⅜ (137)	12 ¼ (311)	10 (254)	¼	—	—	—	34 (15)	D41917000	
0-1 ¾ w/ CPT	3	16 (406)	17 ⅞ (435)	7 ⅞ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	47 (21)		
2-2 ½ w/o CPT	3	16 (406)	17 ⅞ (435)	7 ⅞ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	47 (21)		
2-2 ½ w/ CPT	3	25 ⅞ (637)	17 ⅞ (437)	7 ⅞ (187)	24 ⅞ (618)	14 (355)	¼	—	—	—	55 (25)		
3-3 ½	3	29 (737)	23 ⅞ (589)	9 ¼ (235)	27 ½ (699)	20 (508)	⅝	—	—	—	61 (28)	D43292001	
4	3	29 (737)	23 ⅞ (589)	9 ¼ (235)	27 ½ (699)	20 (508)	⅝	—	—	—	61 (28)	D43292001	
NEMA 12/3R Industrial Use Enclosure (Standard width for use with or without CPT)													
0-1 ¾ w/o CPT	3	13 (330)	12 ⅞ (321)	5 ⅜ (137)	12 ¼ (311)	10 (254)	¼	—	—	—	34 (15)		
0-1 ¾ w/ CPT	3	16 (406)	17 ⅞ (435)	7 ⅞ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	47 (21)	D17150010	
2-2 ½ w/o CPT	3	16 (406)	17 ⅞ (435)	7 ⅞ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	47 (21)	D17150010	
2-2 ½ w/ CPT	3	25 ⅞ (637)	17 ⅞ (437)	7 ⅞ (187)	24 ⅞ (618)	14 (355)	¼	—	—	—	55 (25)		
3-4	3	29 (737)	23 ⅞ (589)	9 ¼ (235)	27 ½ (699)	20 (508)	⅝	—	—	—	61 (28)	D19673000	
NEMA 4X Fiberglass Enclosure (Standard width for use with or without CPT)													
0-2 ½	4	23.780 (604)	23.780 (604)	6.890 (175)	—	—	¼	—	—	—	28 (13)	24139861003	
3-4	4	39.37 (1000)	29.53 (750)	12.60 (320)	—	—	—	—	—	—	—	24139861004	

2 Speed 2 Winding

NEMA 1 General Purpose Enclosure (Standard width for use with or without CPT)													
Size	Fig	Outline Dimensions			Mounting Dimensions			Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	K1	K2	K3			
0-2 ½ w/o CPT	1	19 ⅞ (486)	11 ⅜ (289)	7 ⅞ (195)	15 ⅝ (397)	8 ¼ (210)	¼	½-¾	1-1 ¼	1 ½-2	30 (14)	D68870	
0-2 ½ (200 VA)	1a	24 ⅞ (632)	13 ⅜ (340)	8 ⅞ (206)	21 ¾ (552)	9 (229)	¼	½-¾	1 ¼-1 ½	2-2 ½	52 (24)	D68870	
3-4 w/o CPT	1a	24 ⅞ (632)	13 ⅜ (340)	8 ⅞ (206)	21 ¾ (552)	9 (229)	¼	½-¾	1 ¼-1 ½	2-2 ½	52 (24)	D68870	
NEMA 4/4X Stainless Steel Enclosure (Standard width for use with or without CPT)													
0-1 ¾ w/o CPT	3	13 (330)	12 ⅝ (321)	5 ⅝ (137)	12 ¼ (311)	10 (254)	¼	—	—	—	34 (15)	D43292001	
0-1 ¾ w/ CPT	3	16 (406)	17 ⅞ (435)	7 ⅝ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	41 (19)		
2-2 ½ w/o CPT	3	16 (406)	13 ¼ (337)	6 (152)	15 ¼ (387)	11 (279)	¼	—	—	—	41 (19)		
2-2 ½ w/ CPT	3	16 (406)	17 ⅞ (435)	7 ⅝ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	41 (19)		
3-3 ½ w/o CPT	3	25 ⅞ (637)	17 ⅞ (187)	7 ⅝ (187)	24 ⅞ (618)	14 (355)	¼	—	—	—	55 (25)		
3-3 ½ w/ CPT	3	29 (737)	23 ⅞ (589)	9 ¼ (235)	27 ½ (699)	20 (508)	⅝	—	—	—	61 (28)		
4	3	29 (737)	23 ⅞ (589)	9 ¼ (235)	27 ½ (699)	20 (508)	⅝	—	—	—	61 (28)	D43292001	
NEMA 12/3R Industrial Use Enclosure (Standard width for use with or without CPT)													
0-1 ¾ w/o CPT	3	13 (330)	12 ⅝ (321)	5 ⅝ (137)	12 ¼ (311)	10 (254)	¼	—	—	—	34 (15)	D17150010	
0-1 ¾ w/CPT	3	16 (406)	17 ⅞ (435)	7 ⅝ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	41 (19)		
2-2 ½ w/o CPT	3	16 (406)	13 ¼ (337)	6 ⅞ (156)	15 ¼ (387)	11 (279)	¼	—	—	—	41 (19)	D17150010	
2-2 ½ w/CPT	3	16 (406)	17 ⅞ (435)	7 ⅝ (194)	15 ¼ (387)	14 (355)	¼	—	—	—	41 (19)		
3-3 ½ w/o CPT	3	25 ⅞ (637)	17 ⅞ (187)	7 ⅝ (187)	24 ⅞ (618)	14 (355)	¼	—	—	—	55 (25)	D19673000	
3-4 w/CPT	3	29 ⅞ (738)	23 ⅞ (589)	9 ¼ (235)	27 ⅞ (700)	20 (508)	⅝	—	—	—	61 (28)		
NEMA 4X Fiberglass Enclosure (Standard width for use with or without CPT)													
0-2 ½	4	23.780 (604)	23.780 (604)	6.890 (175)	—	—	¼	—	—	—	28 (13)	24139861003	
3-4	4	39.37 (1000)	29.53 (750)	12.60 (320)	—	—	—	—	—	—	—	24139861004	

Note: Dimensions in inches (mm). Dimensions for reference, not for construction. Contact sales office for dimensions not listed.

Combination Two Speed Heavy Duty Starters

Enclosed, Class 32

Dimensions

Figure 1

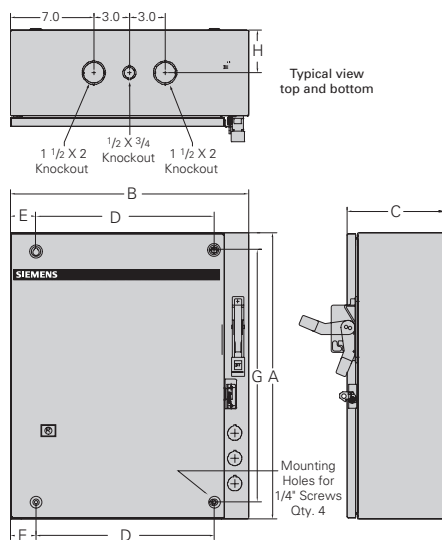


Figure 2

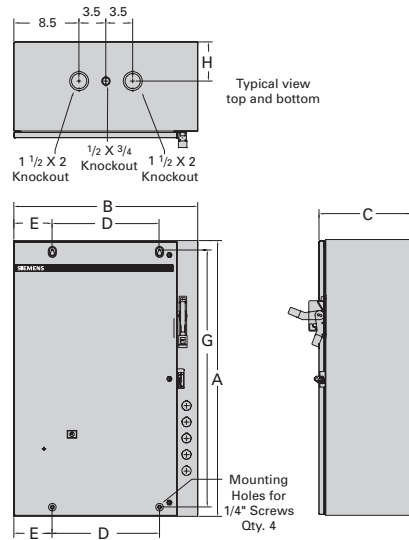


Figure 3

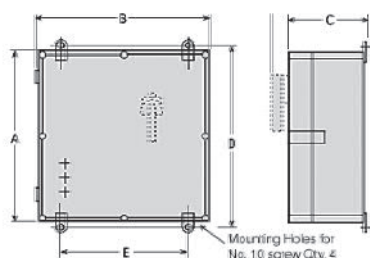
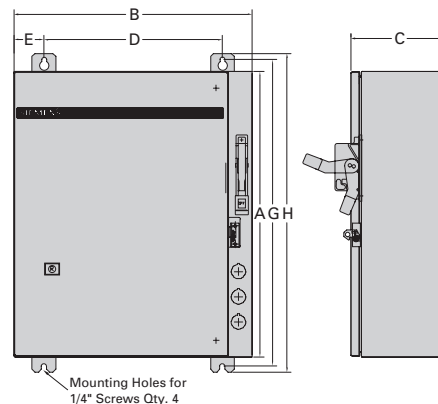


Figure 4



NEMA 1 Standard Width 0-4

Size	Figure	Outline Dimensions			Mounting Dimensions				Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E	G	H		
0-1 1/4 (1 Winding)	1	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	68 (31)	D68774
2-4 (1 Winding)	2	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	3.50 (90)	71 (32)	D68774
0-2 1/2 (2 Winding)	1	24 (610)	20 (508)	8 (203)	15.00 (381)	2.125 (54)	21.00 (533)	3.50 (90)	135 (61)	D68774
3-4 (2 Winding)	2	36 (914)	24 (610)	8 (203)	14.00 (356)	5.00 (127)	33.50 (851)	3.50 (90)	138 (63)	D68774

NEMA 12/3/3R/4 (Painted), 4/4X Stainless Standard Width 0-4

0-1 1/4 (1 Winding)	4	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (680)	68 (31)	D68774
2-4 (1 Winding)	4	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	71 (32)	D68774
0-2 1/2 (2 Winding)	4	24 (610)	20 (508)	8 (203)	15.00 (381)	2.50 (64)	25.75 (654)	26.75 (680)	135 (61)	D68774
3-4 (2 Winding)	4	36 (914)	24 (610)	8 (203)	12 (305)	6.00 (152)	37.75 (959)	38.75 (984)	138 (63)	D68774

Nema 4X Fiberglass 0-4

Size	Figure	Outline Dimensions			Mounting Dimensions		Mtg Screw	Conduit Size			Approx Ship Wt Lbs (Kg)	Ref Dwg
		A	B	C	D	E		K1	K2	K3		
0-1 1/4	3	23.780 (604)	14.680 (373)	6.890 (175)	24.125 (613)	12.250 (311)	1/4	—	—	—	18 (8)	—
2-4	3	23.780 (604)	23.780 (604)	6.890 (175)	24.125 (613)	21.250 (540)	1/4	—	—	—	28 (13)	—

Note: Dimensions in inches (mm).
 Dimensions for reference, not for construction.
 Contact sales office for dimensions not listed.

Figure 1

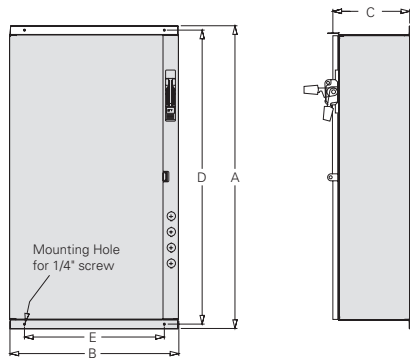
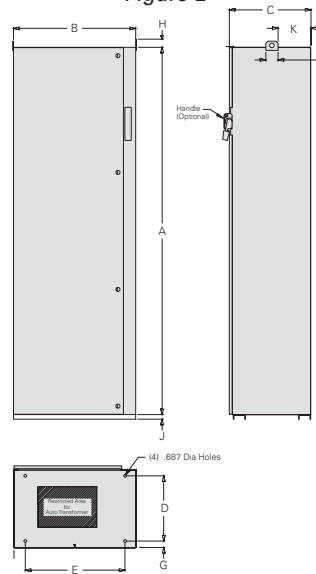


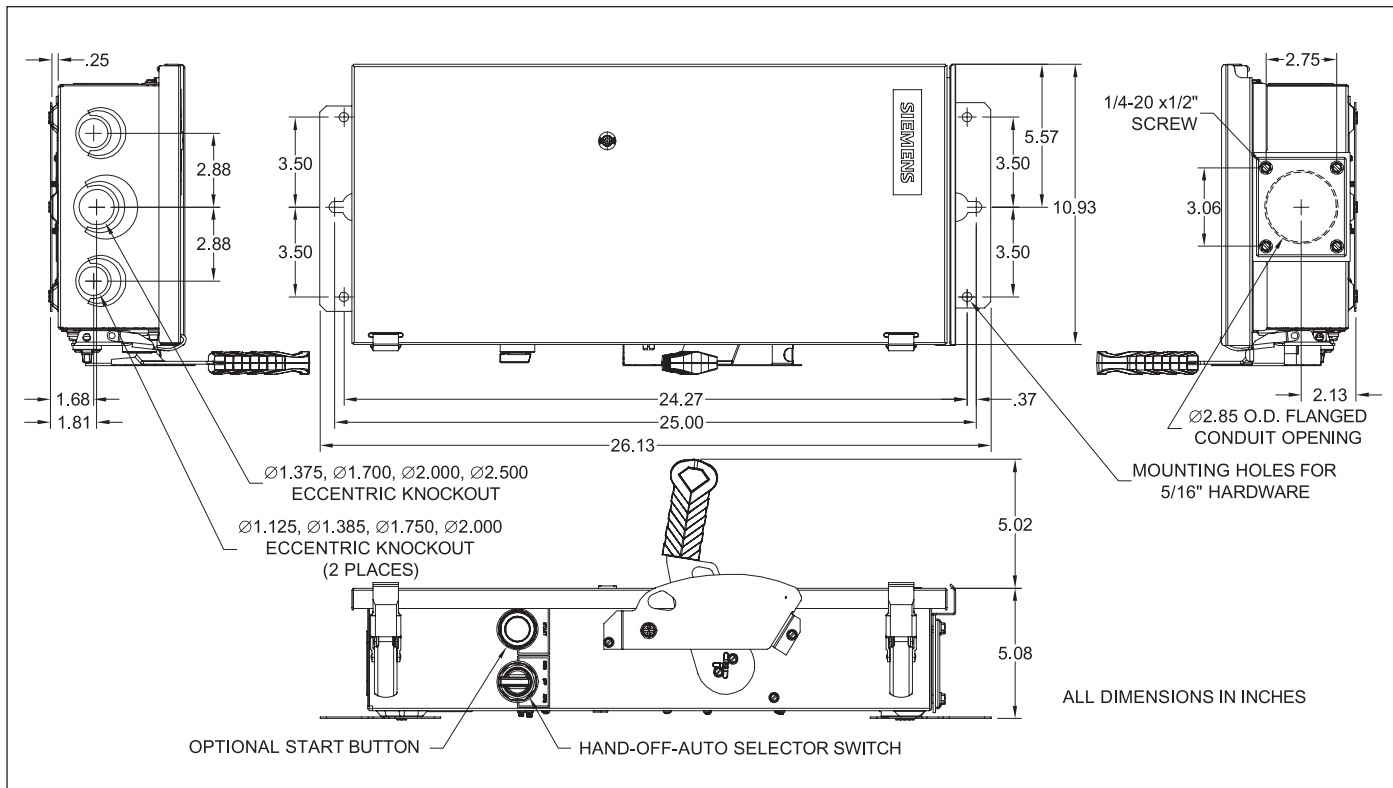
Figure 2



Class 36, 37, NEMA 1, 4, 4X, 12/3R, Combination and Non-combination

Reduced Voltage AutoTransformer Size	Part Winding & Wye Delta		Figure	A	B	C	D	E	G	H	I	J	K	L
	Disconnect	Circuit Breaker												
1 3/4-2 1/2	0-2	0-2 1/2	1	43 5/16	24 5/32	11	42 11/32	20	—	—	—	—	—	—
3-3 1/2	2 1/2-3 1/2	3-3 1/2	1	55 5/16	28 9/32	11	54 11/32	24	—	—	—	—	—	—
4	4	4	1	74 27/32	28 9/32	11	73 13/32	24	—	—	—	—	—	—
5, 6	5, 6	5, 6	2	90	29 30/31	20	16	24 7/16	2 16/21	1 23/40	—	1 1/8	8 3/40	3

Class 82

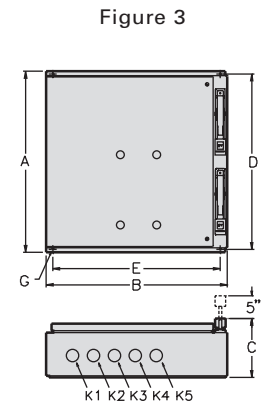
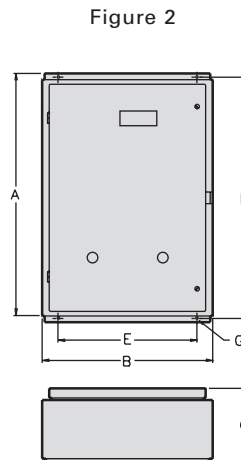
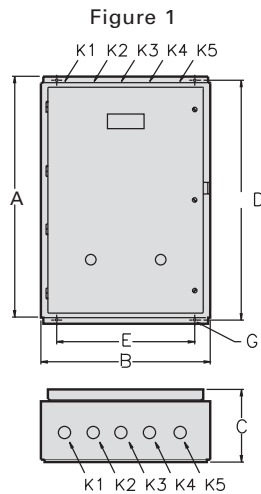


Duplex Heavy Duty Controllers

Class 83, 84

• Revised •
07/20/15

Dimensions



Class 83 Non-Combination Type

Enclosure Type	Size	Outline Dimensions				Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs
		Figure	A	B	C	D	E		K1	K2	K3	K4	K5	
NEMA 1	0-1½	1	19½	16½	6½	18¾	13	¼	1¼-1½	½-¾	½	½-¾	1¼-1½	20
	2, 2½	1	25⅞	17¾	7¾	24⅞	14	¼	1¼-1½	½-¾	½-¾	1¼-1½	1½-2	57
	3-4	1	29⅞	23⅞	9¼	27⅞	20	⅝	2-2½	1¼-1½	½-¾	1¼-1½	2-2½-3	93
NEMA 12	0-1½	2	19½	16½	6½	18¾	13	¼	—	—	—	—	—	20
	2, 2½	2	25⅞	17¾	7¾	24⅞	14	¼	—	—	—	—	—	57
	3-4	2	29⅞	23⅞	9¼	27⅞	20	⅝	—	—	—	—	—	93
NEMA 4/4X ^②	0-1½	2	19½	16½	6½	18¾	13	¼	—	—	—	—	—	20
	2, 2½	2	25⅞	17¾	7¾	24⅞	14	¼	—	—	—	—	—	57
	3-4	2	29⅞	23⅞	9¼	27⅞	20	⅝	—	—	—	—	—	93

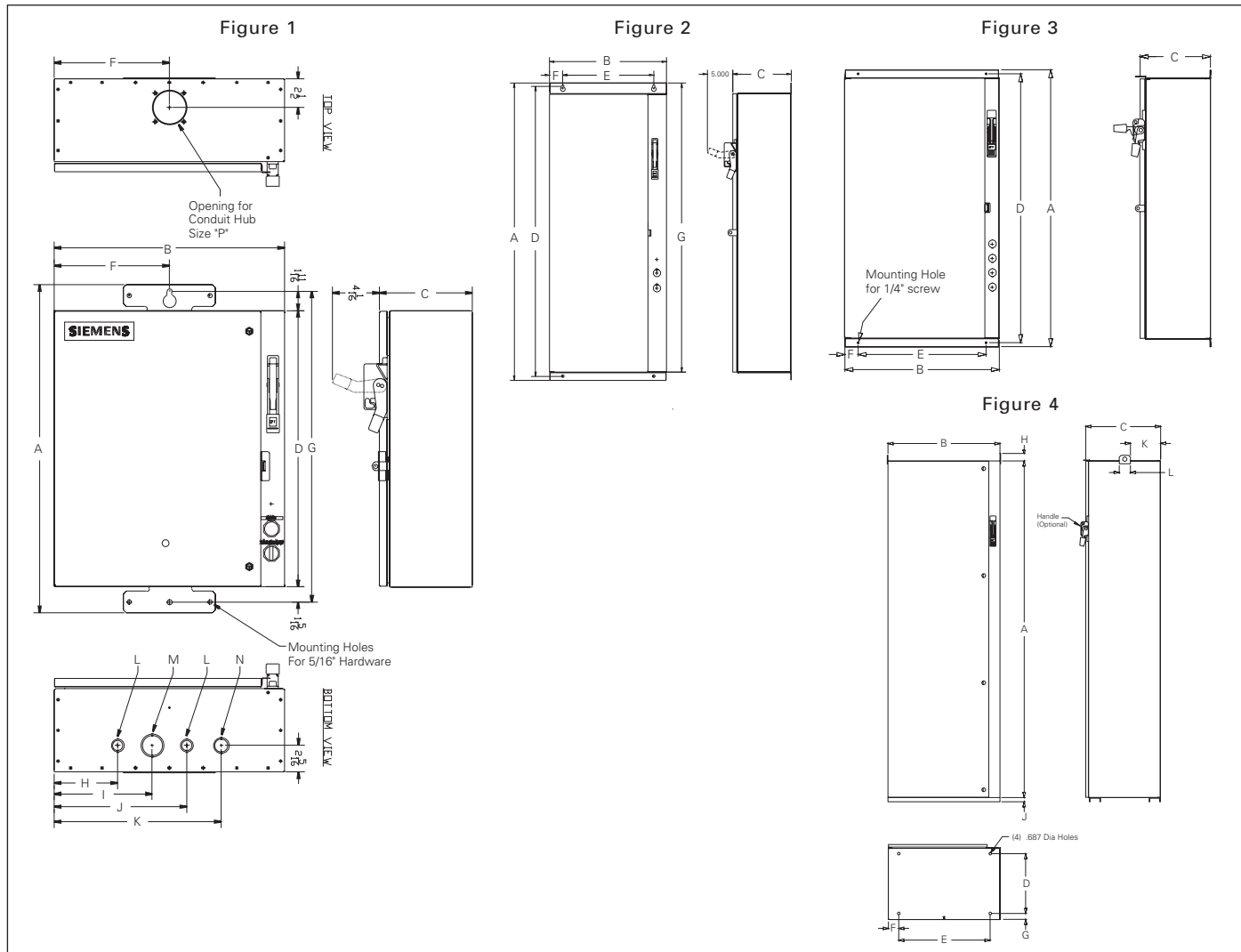
Class 84 Combination Type

Enclosure Type	Size	Outline Dimensions				Mounting Dimensions		Mounting Screw	Conduit Size					Approx Ship Wt Lbs
		Figure	A	B	C	D	E		K1	K2	K3	K4	K5	
NEMA 1	0-1½	3	34⅞	24⅞	7⅞	33	20	⅜	⅞-1⅞	⅞-1⅞	1⅞-1⅞	1⅞-1⅞	1⅞-1⅞	70
	2-4	3	56	28½	9⅞	54⅞	24¼	⅜	—	—	—	—	—	106
NEMA 4(painted) 4X, 12	0-1½	3	34⅞	24⅞	7⅞	33	20	⅜	—	—	—	—	—	70
	2-4	3	56	28½	9⅞	54⅞	24¼	⅜	—	—	—	—	—	106

① Dimensions may vary for size 3 & 4 stainless steel enclosures.

② NEMA 4 Painted, 4X Stainless Steel.

Outline Drawings



Class 87 Standard and Vacuum Starter Pump Panel

Size	Figure	A	B	C	D	E	F	G	H	I	J	K	Conduit Knockout			Hub
													L	M	N	P
1 - 2 1/2	1	28 3/2	20	8 1/16	24	—	10	27	5 1/2	8 1/2	11 1/2	14 1/2	1/2 x 3/4	1 1/4 x 1	3/4 x 1	1 1/2
3 - 4	1	40 1/2	24	8 3/32	36	—	12	39	8 7/16	11 15/16	15 7/16	—	1 31/32 x 2 15/32	7/8 x 1 1/8	—	2 1/2
5	2	72 5/32	20	11	71	16	2 1/8	70 29/32	—	—	—	—	—	—	—	—
6	2	79 1/8	22	12 15/16	78	18	2 1/8	77 7/8	—	—	—	—	—	—	—	—
4 (Vac)	2	55 31/32	24 3/8	9 22/32	54 26/32	20 1/4	2 1/8	54 23/32	26 3/16	—	5	27 14/32	—	—	—	—

Class 88 Reduced Voltage Pump Panels

RVAT Size	Part Winding & Wye Delta		Figure	A	B	C	D	E	F	H	I	J	K	L
	Fusible Disconnect	Circuit Breaker												
2-2 1/2	1-2	1-2 1/2	3	43 5/16	24 5/32	11	42 11/32	20	2 1/16	—	—	—	—	—
3-3 1/2	2 1/2-3 1/2	3-3 1/2	3	55 5/16	28 9/32	11	54 11/32	24	2 1/8	—	—	—	—	—
4	4	4	3	74 21/32	28 9/32	11	73 13/32	24	2 1/8	—	—	—	—	—
5, 6	5, 6	5, 6	4	90	30	20	16	24 7/16	2 3/4	1 1/2	—	1 1/8	8 1/16	3

Note: Dimensions in inches (millimeters). Dimensions for reference, not for construction. Contact Sales Office for dimensions not listed.

Lighting Contactors

Enclosed Contactors, Class LC and LE

• Revised •
01/26/16

Dimensions

Figure 1

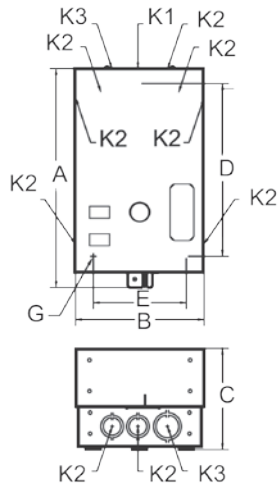


Figure 2

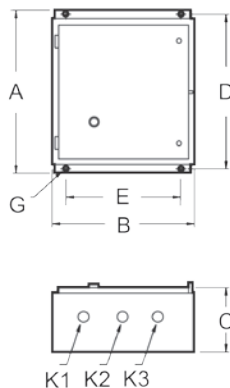
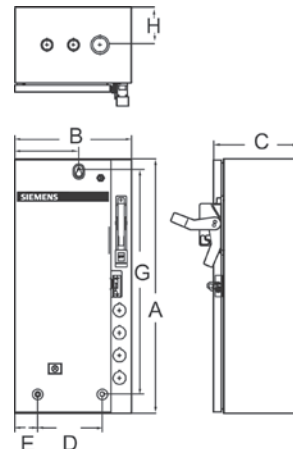


Figure 3



Enclosure Type	Contactor Rating (Class LC and LE)	Fig.	Outline Dimensions			Mounting		Conduit Size				
			A	B	C	D	E	K1	K2	K3	K4	K5
1 without CPT	LE 20/30A 3-4P	1	10.97	6.41	5.03	8.22	4.62	0.5	0.50-0.75	0.75-1	—	—
	LC 30A 2-12P, LE 60A 3P	1	13.53	7.97	6.38	10.25	6.00	0.50-0.75	0.75-1	1-1.25	—	—
	LE 30/60A 6-12P, LE 100A 3P	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	25.19	15.50	0.50-0.75	1.25-1.5	1.25-1.5	—	—
1 with CPT	LC 30A 2-12P, LE 20A 3-4P, LE 30A 3-9P, LE 60A 3-9P, LE 100A 3P	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	LE 30/60A 12P	1	24.88	13.38	8.12	21.75	9.00	0.50-0.75	1.25-1.5	2-2.5	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	25.19	15.50	—	1.25-1.5	1.25-1.5	—	—
12/3R & 4/4X without CPT	LE 20A 3-4P, LE 30/60A 3-9P, LE 100A 3P, LC 30A 2-12P	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	LE 30/60A 12P	2	26.00	13.12	7.56	25.25	10.00	—	—	—	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	23.19	15.50	—	—	—	—	—
12/3R & 4/4X with CPT	LE 20/30A 3-4P, LE 60A 3P	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	LC 30A 2-12P	2	16.00	17.13	7.63	15.25	11.00	—	—	—	—	—
	LE 30/60A 6-12P, LE 100A 3P	2	26.00	13.12	7.56	15.25	14.00	—	—	—	—	—
	LE 200-400A 3P	2	26.00	17.62	12.50	25.19	15.50	—	—	—	—	—

Enclosure Type	Type (Class LE)	Contactor Rating	Fig.	Outline Dimensions		
				A	B	C
1, 12 & 4/4X with and without CPT	Fusible and Non-fusible Disconnect	20-60A	3	24	11	8
		100A	3	24	20	8
		200A	3	46	20	10
		300A	3	76	22	13
	Circuit Breaker	20-100A	3	24	11	8

Dimensions are in inches.

1) G designates 0.25" mounting screw.

2) Enclosures shown in figure 1 have lift-off covers. All other enclosures have hinged covers.

Figure 1

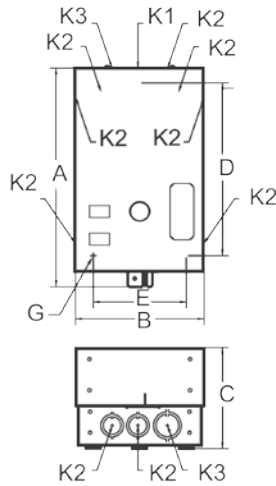


Figure 2

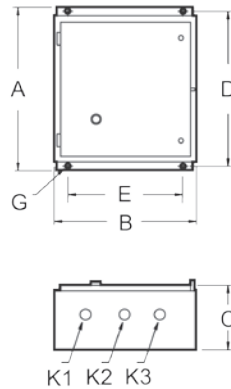
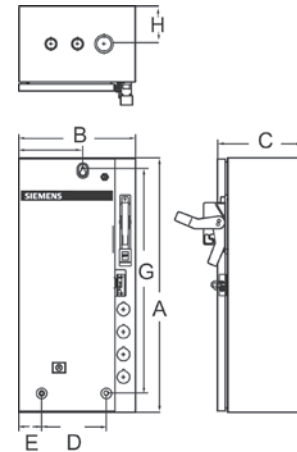


Figure 3



Enclosure Type	Contactor Rating (Class CLM)	Fig.	Outline Dimensions			Mounting		Conduit Size				
			A	B	C	D	E	K1	K2	K3	K4	K5
1 without CPT	30-60A (2-5p)	1	10.97	6.41	5.03	8.22	4.62	0.5	0.50-0.75	0.75-1	—	—
	20A (2-12p)	1	13.53	7.97	6.38	10.25	6.00	0.50-0.75	0.75-1	1-1.25	—	—
	30-60A (6-12p)	2	16.00	17.12	7.62	15.25	14.00	0.50-0.75	1.25-1.5	1.25-1.5	—	—
	100A (2-5p)	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	200A (2-5p)	1	24.88	13.38	8.12	21.75	9.00	0.50-0.75	1.25-1.5	2.5	—	—
	300-400A (2-5p)	2	48.00	20.00	12.50	45.19	10.00	2.00-2.50	1.25-1.5	0.5-0.75	1.25-1.5	2-2.5
1 with CPT	20A (2-12p), 30A (2-5p)	1	19.12	11.38	7.69	15.62	8.25	0.50-0.75	1-1.25	1.5-2	—	—
	30-60A (6-12p)	2	16.00	17.12	7.62	15.25	14.00	0.50-0.75	1.25-1.5	1.25-1.5	—	—
	100-200A (2-5p)	2	26.00	17.62	12.50	25.19	15.50	—	1.25-1.5	1.25-1.5	—	—
	300-400A (2-5p)	2	48.00	20.00	12.50	45.19	10.00	2.00-2.50	1.25-1.5	0.5-0.75	1.25-1.5	2-2.5
12/3R & 4/4X without CPT	20A (2-12p), 30A (2-12p), 60A (2-10p)	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	100A (2-5p)	2	16.00	13.00	9.50	15.12	11.00	—	—	—	—	—
	60A (12p)	2	19.00	22.00	8.00			—	—	—	—	—
	200A (2-5p)	2	26.00	17.62	12.50	23.19	15.50	—	—	—	—	—
	300A-400A (3p)	2	48.00	20.00	12.50	49.00	10.00	—	—	—	—	—
12/3R & 4/4X with CPT	20A (2-12p), 30A (2-5p)	2	16.00	13.25	6.12	15.25	11.00	—	—	—	—	—
	30A (6-12p)	2	16.00	17.12	7.62	15.25	14.00	—	—	—	—	—
	60-100A (2-5p)	2	16.00	13.00	9.50	15.12	11.00	—	—	—	—	—
	60A (6-12p)	2	19.00	22.00	8.00			—	—	—	—	—
	200A (3p)	2	26.00	17.62	12.50	25.19	15.50	—	—	—	—	—
	300-400A (3p)	2	48.00	20.00	12.50	49.00	10.00	—	—	—	—	—

Enclosure Type	Type (Class CM)	Contactor Rating	Fig.	Outline Dimensions		
				A	B	C
1, 12 & 4/4X with and without CPT	Fusible and Non-fusible Disconnect	20-60A	3	24	11	8
		100A	3	24	20	8
		200A	3	46	20	10
		300A	3	76	22	13
	Circuit Breaker	20-100A	3	24	11	8

Dimensions are in inches.

1) G designates 0.25" mounting screw.

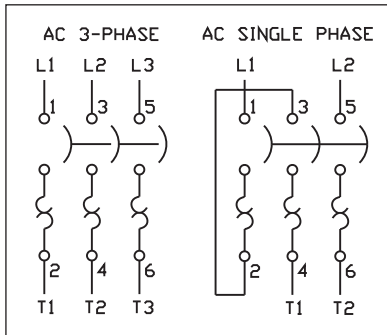
2) Enclosures shown in figure 1 have lift-off covers. All other enclosures have hinged covers.

Manual Control

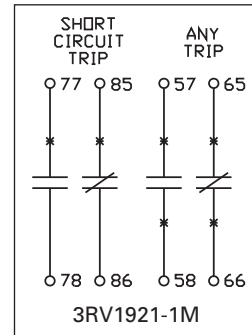
Class 11 - 3RV, SMF, MMS

Wiring Diagrams

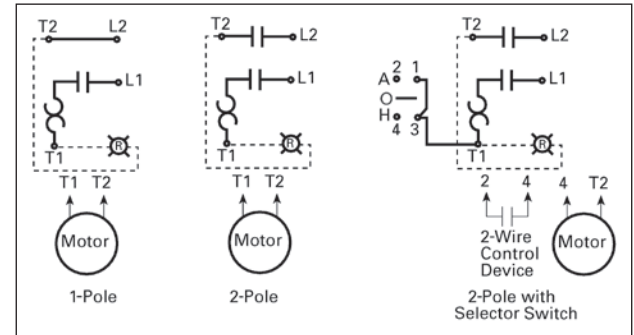
Class 11 - 3RV



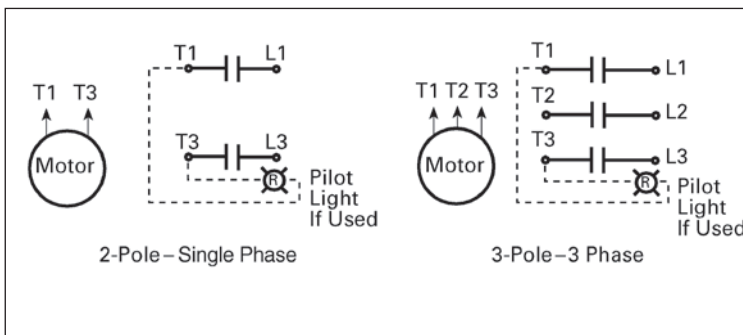
Signaling Contact for Class 11 - 3RV



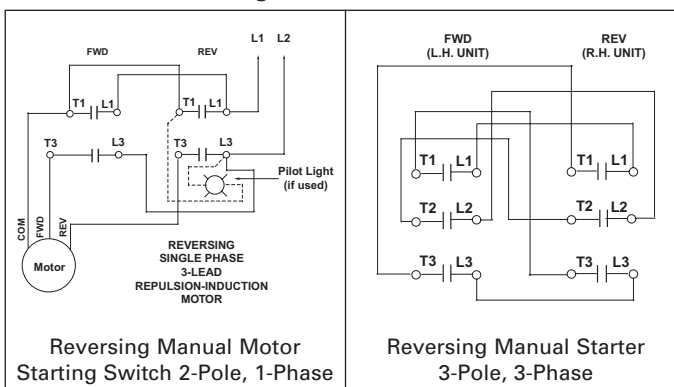
Typical Wiring Diagrams—Class SMF



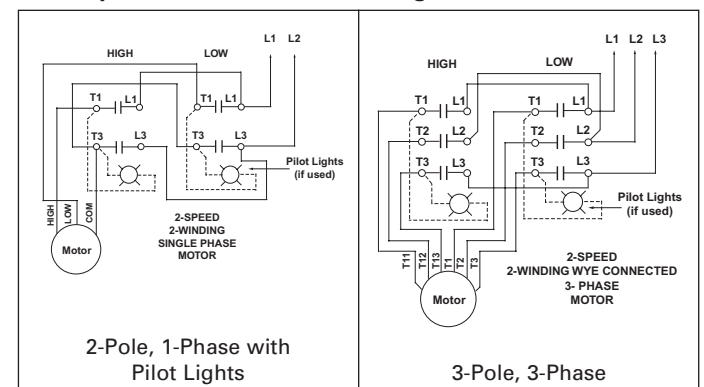
Typical Wiring Diagrams—MMS



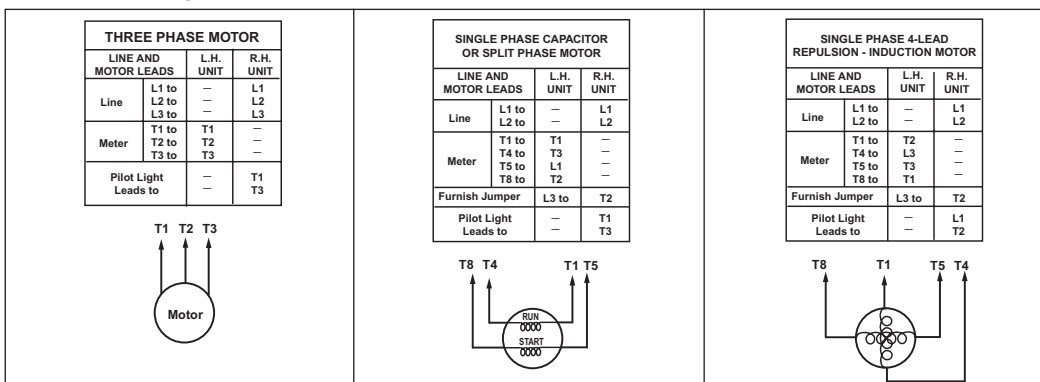
AC Reversing Manual Starter and Manual Motor Starting Switches



AC 2-Speed Manual Motor Starting Switches

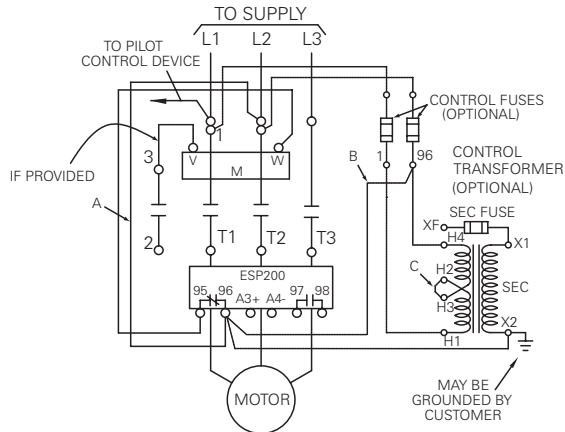


3-Pole Reversing Switches

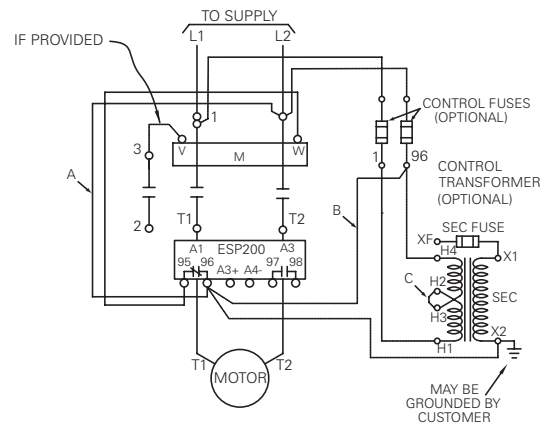


3-Phase and Single Phase Magnetic Starters

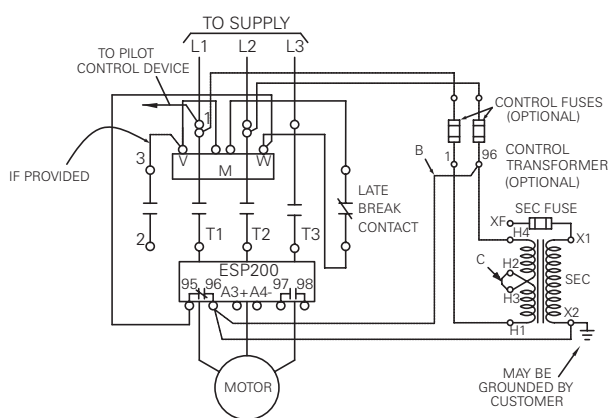
Three Phase Magnetic Starter, Size 00-4



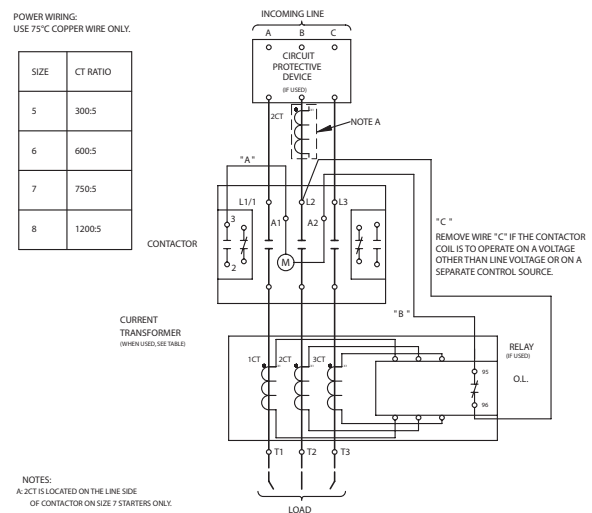
Single Phase Magnetic Starter^②



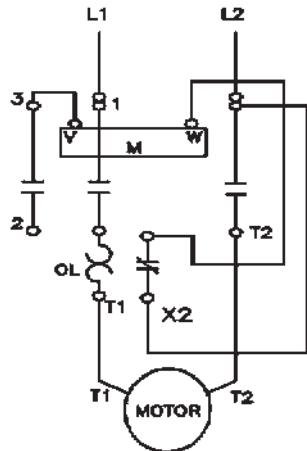
Three Phase Magnetic Starter with DC Coil, Sizes 00-4



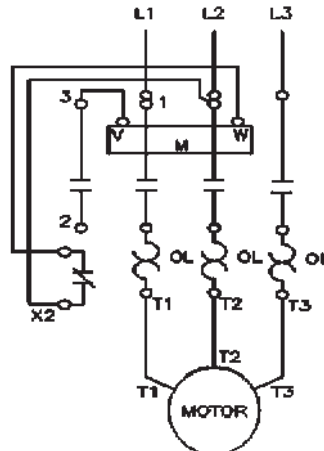
Solid State Overload 3-Phase Sizes 5-8



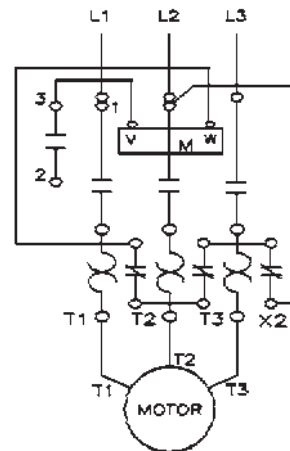
Ambient Compensated Single Phase Sizes 00-2 1/2



Ambient Compensated 3-Phase Sizes 00-2 1/2



Ambient Compensated 3-Phase Sizes 3-4



① Warning: The ESP200 Starter and Single Phase Motor must be wired as shown above. For L1, L2 do not use the middle terminal or hole.

② Full Load Amps (FLA): Adjustment of the ESP200 solid state overload relay accommodates the single phase motor.

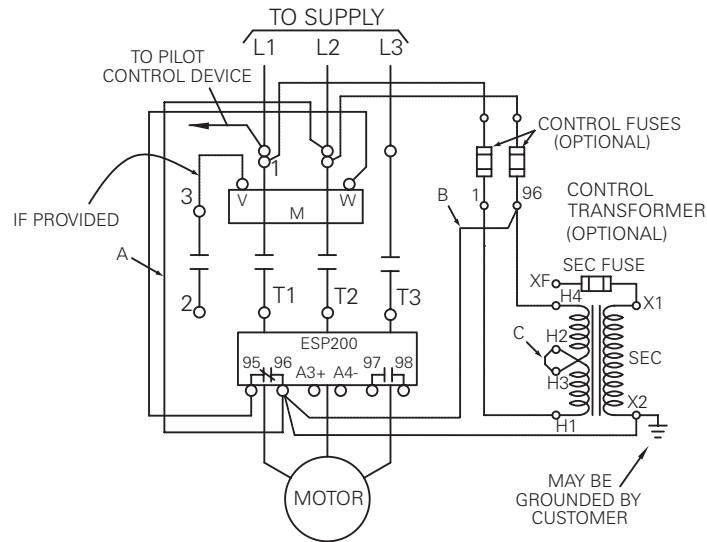
Combination Heavy Duty Starters

Class 17, 18

Wiring Diagrams

3-Phase

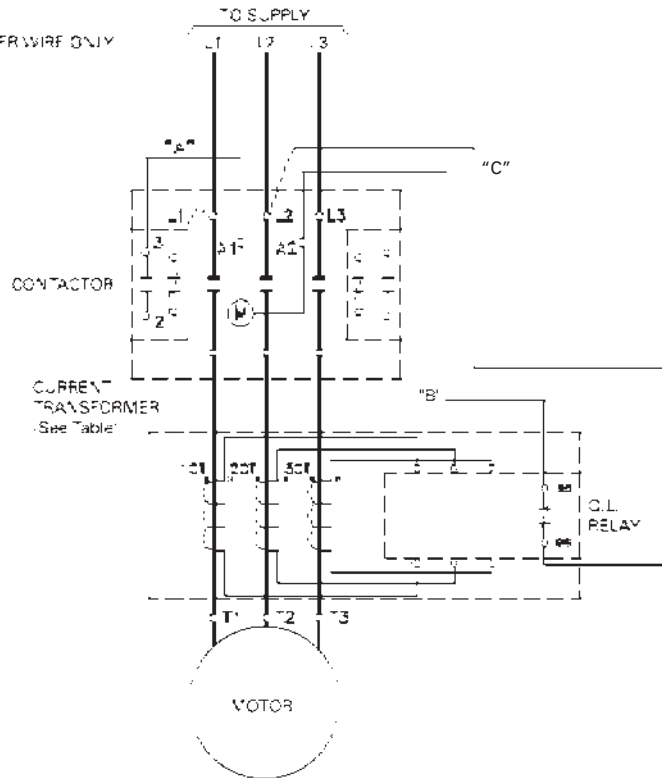
Size 00-4^①



Size 5-8^②

POWER WIRING
USE 75°C COPPER WIRE ONLY

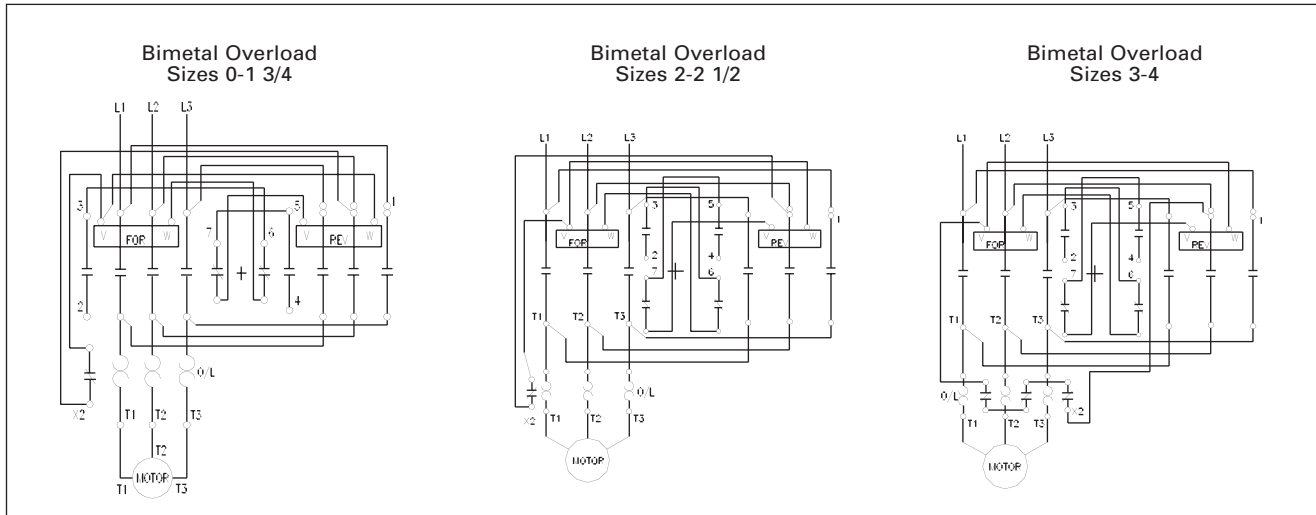
SIZE	CT RATIO
5	300:5
6	600:5
7	750:5
8	1200:5



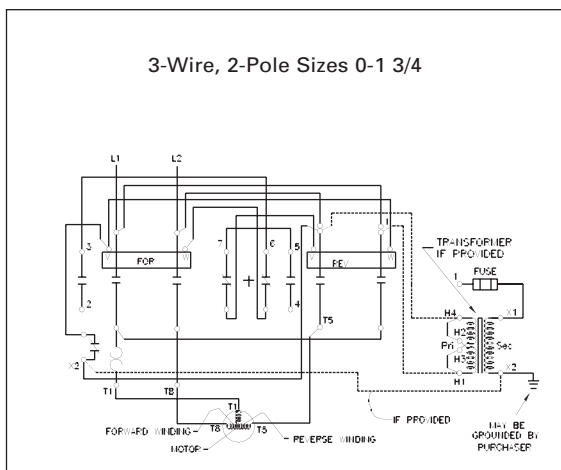
^① Remove wire "C" if control transformer is used. For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse line terminals.

^② Remove wire "C" if the contactor coil is to operate on a voltage other than line voltage or in a separate control source.

3-Phase Ambient Compensated Overload



Single Phase Ambient Compensated Overload



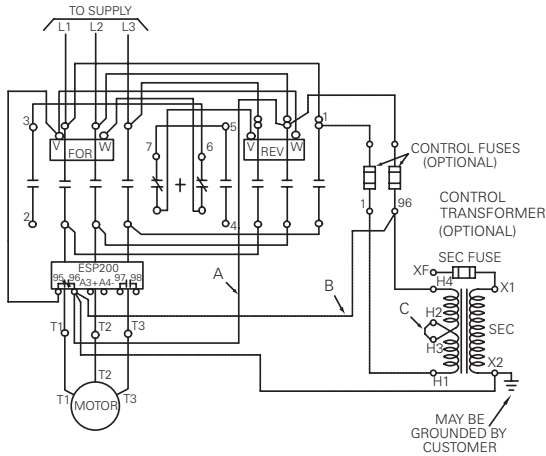
Reversing Heavy Duty Starters

Class 22

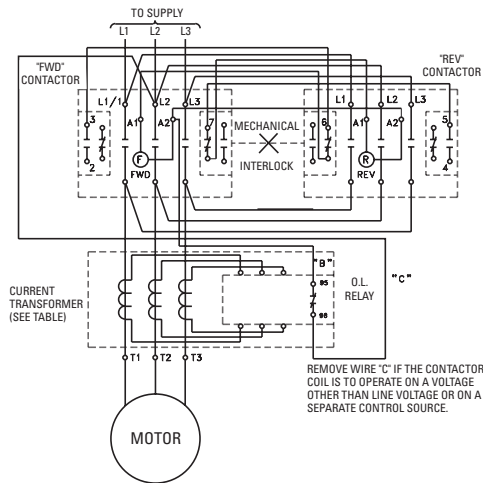
Wiring Diagrams

3-Phase Solid State Overload

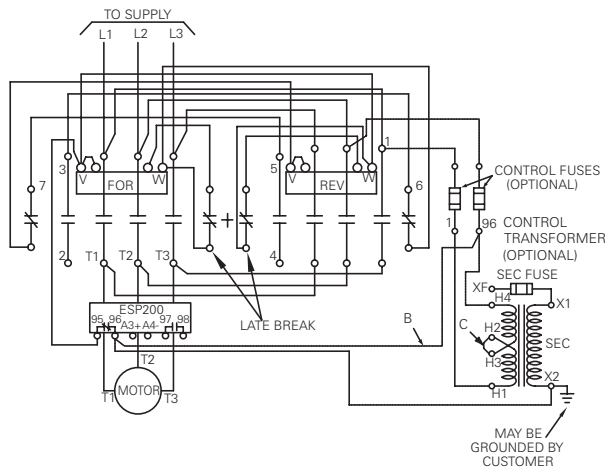
3-Phase Reversing Magnetic Starter
Sizes 00-1½



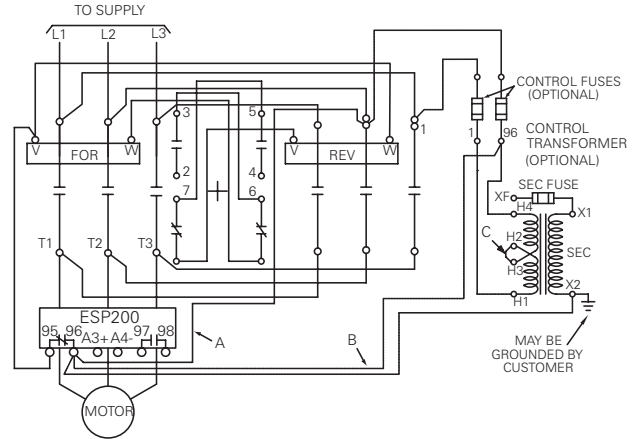
Solid State Overload
Sizes 5-6



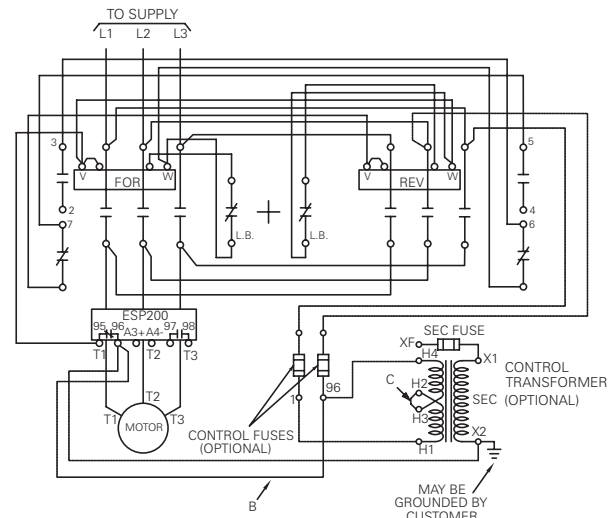
3-Phase Reversing Magnetic Starter
with DC Coil, Sizes 00-1½



3-Phase Reversing Magnetic Starter
Sizes 2-4

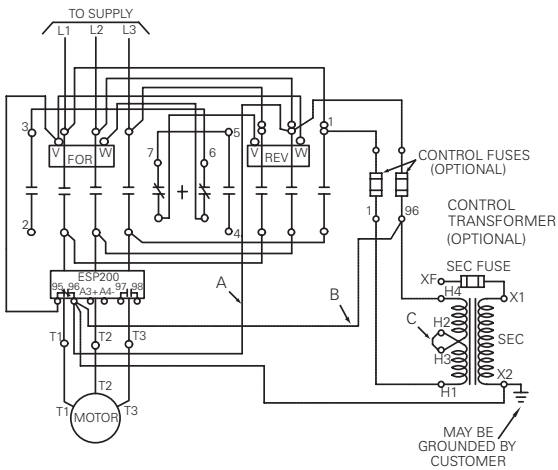


3-Phase Reversing Magnetic Starter
with DC Coil, Sizes 2-4

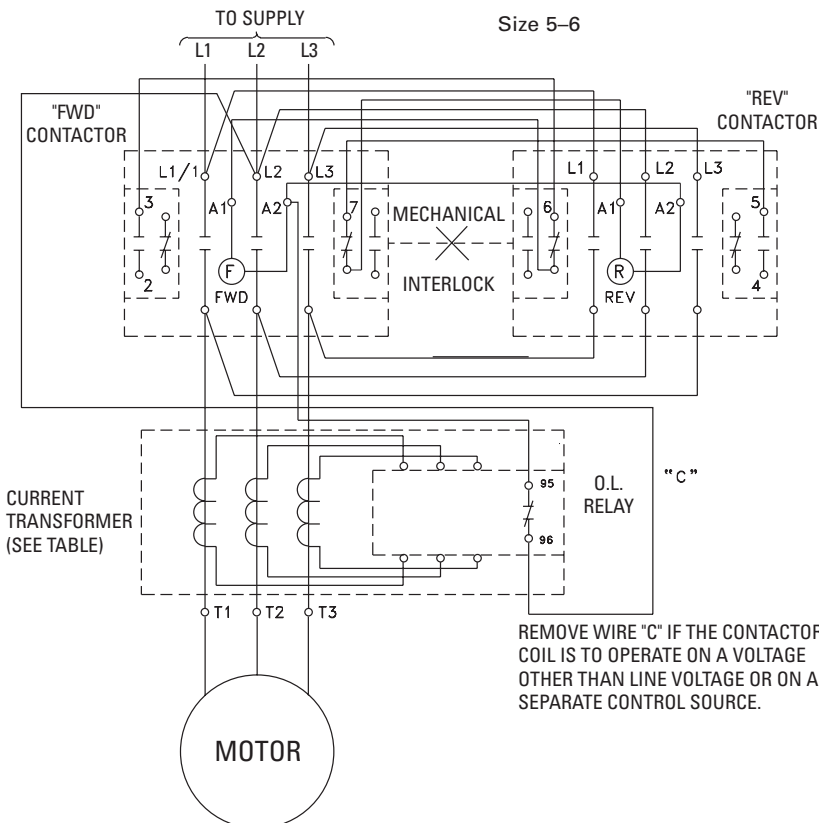
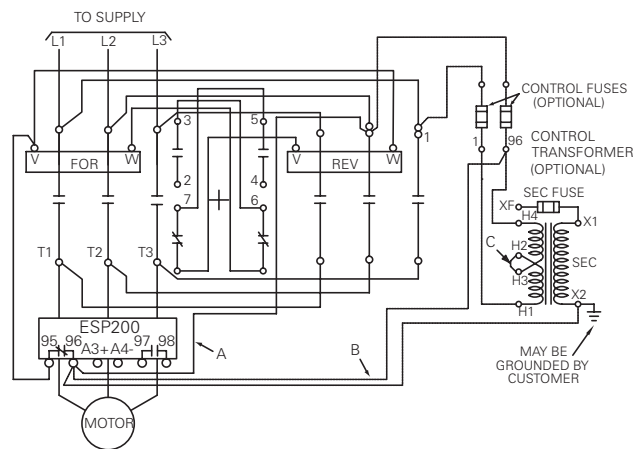


3-Phase

3-Phase Reversing Magnetic Starter
Sizes 00-1 $\frac{1}{4}$



3-Phase Reversing Magnetic Starter
Sizes 2-4



SIZE	CT RATIO
5	300:5
6	600:5

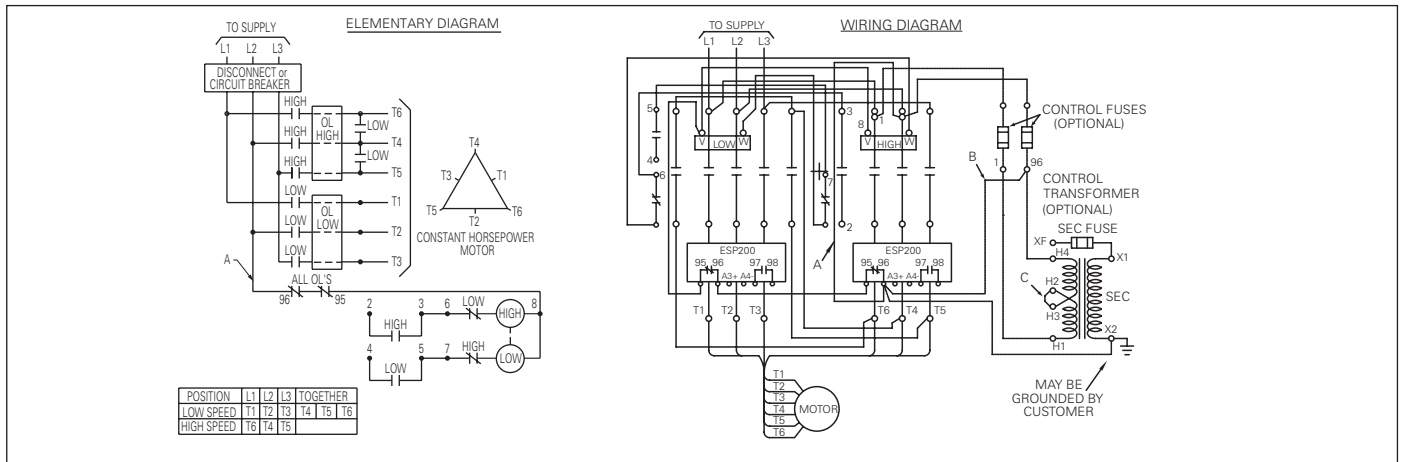
REMOVE WIRE "C" IF THE CONTACTOR COIL IS TO OPERATE ON A VOLTAGE OTHER THAN LINE VOLTAGE OR ON A SEPARATE CONTROL SOURCE.

Two Speed Heavy Duty Starters

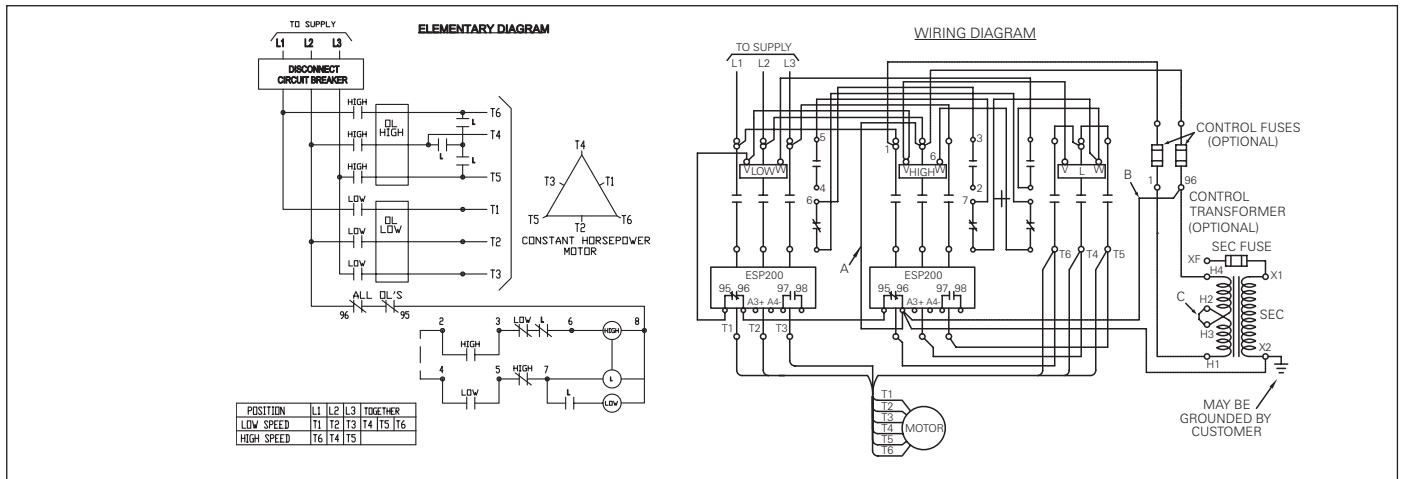
Class 30 & 32 Non-Combination and Combination Starters

Wiring Diagrams

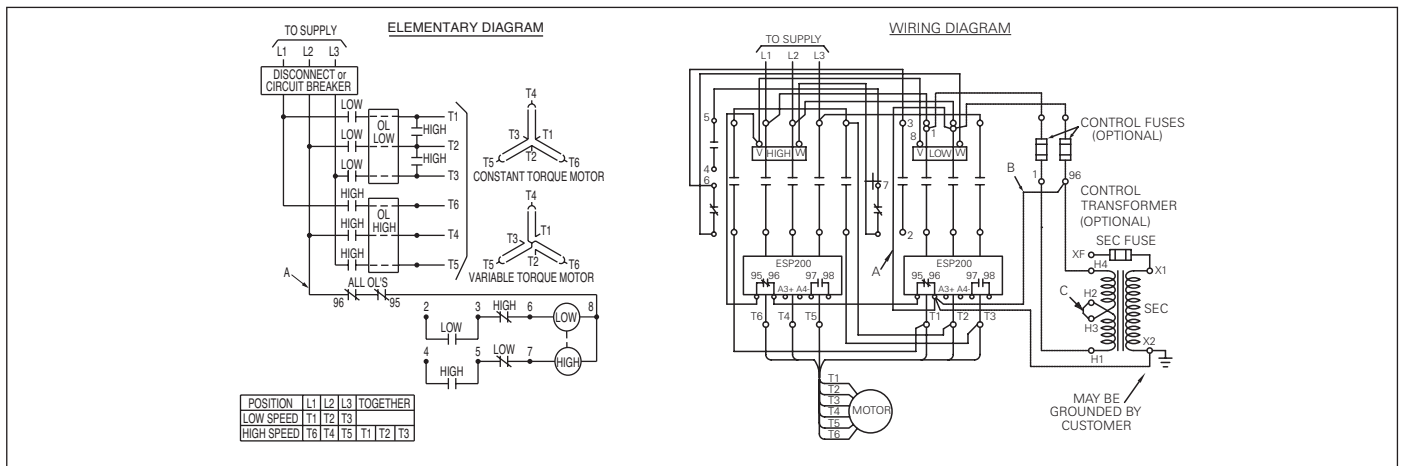
1 Winding Constant Horsepower Size 0-1³/₄



1 Winding Constant Horsepower Size 2-4



1 Winding Constant or Variable Torque Size 0-1³/₄



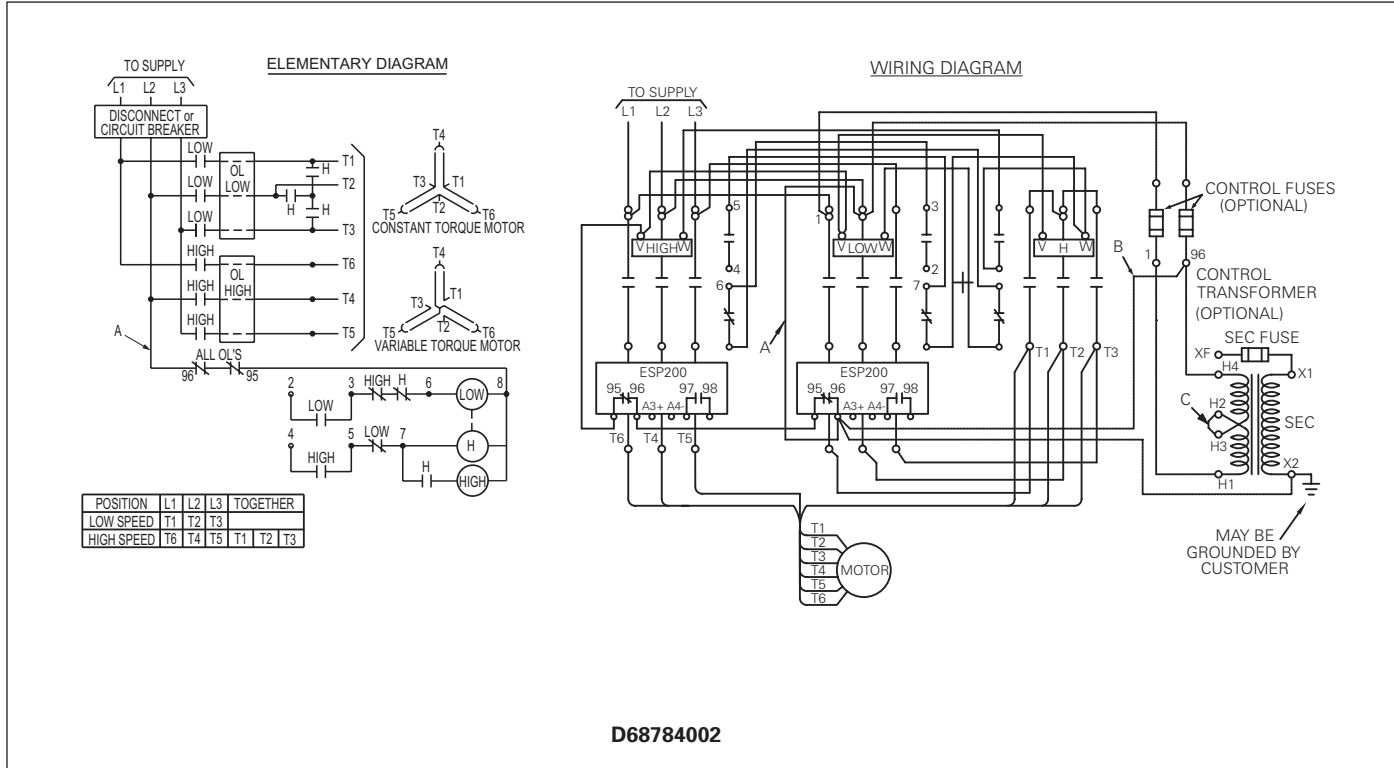
Note: For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse terminal. Remove jumper "C" if control transformer is used.

Two Speed Heavy Duty Starters

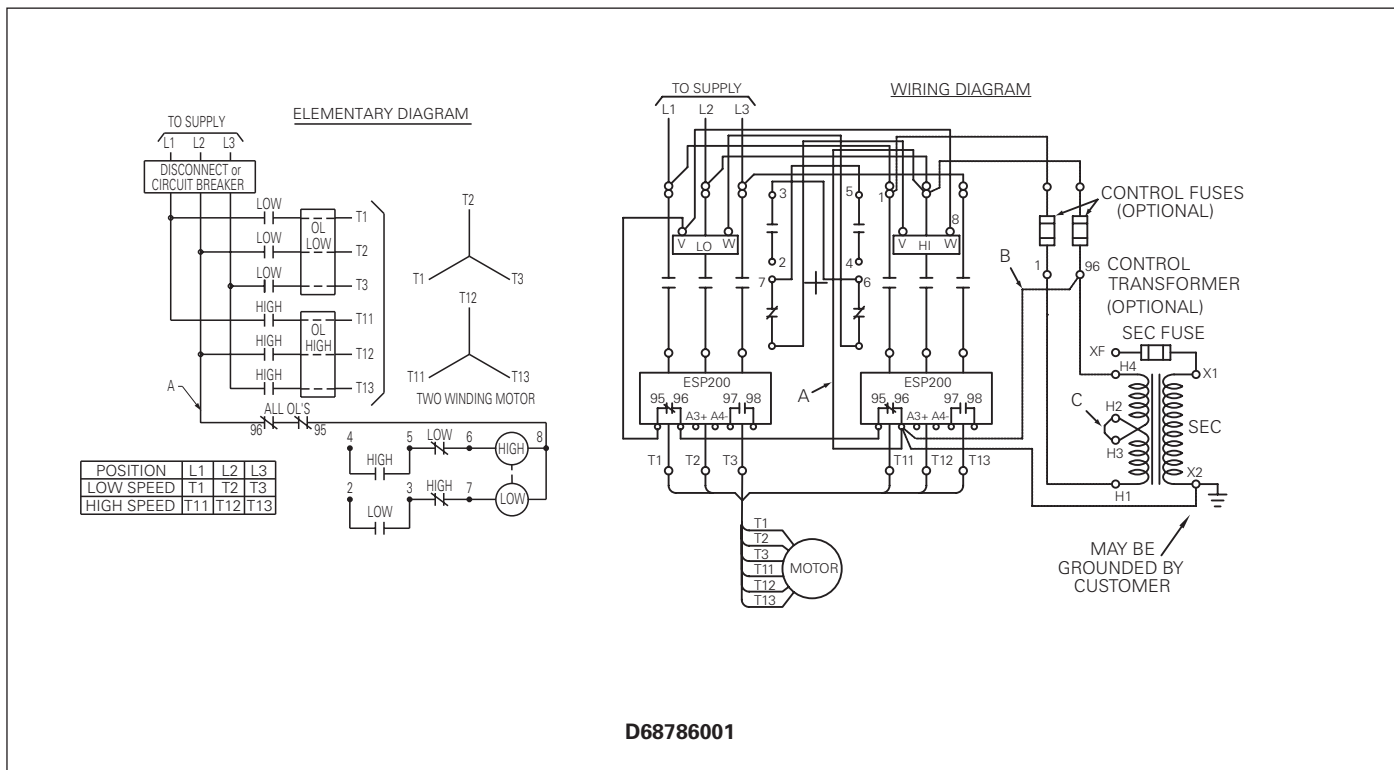
Class 30 & 32 Non-Combination and Combination Starters

Wiring Diagrams

1 Winding Constant or Variable Torque Size 2-4



2 Winding Constant Horsepower & 2 Winding Constant or Variable Torque Size 0-4



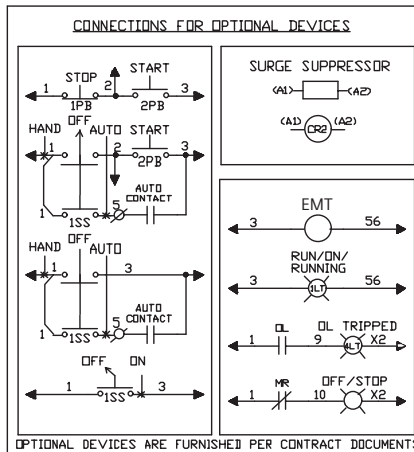
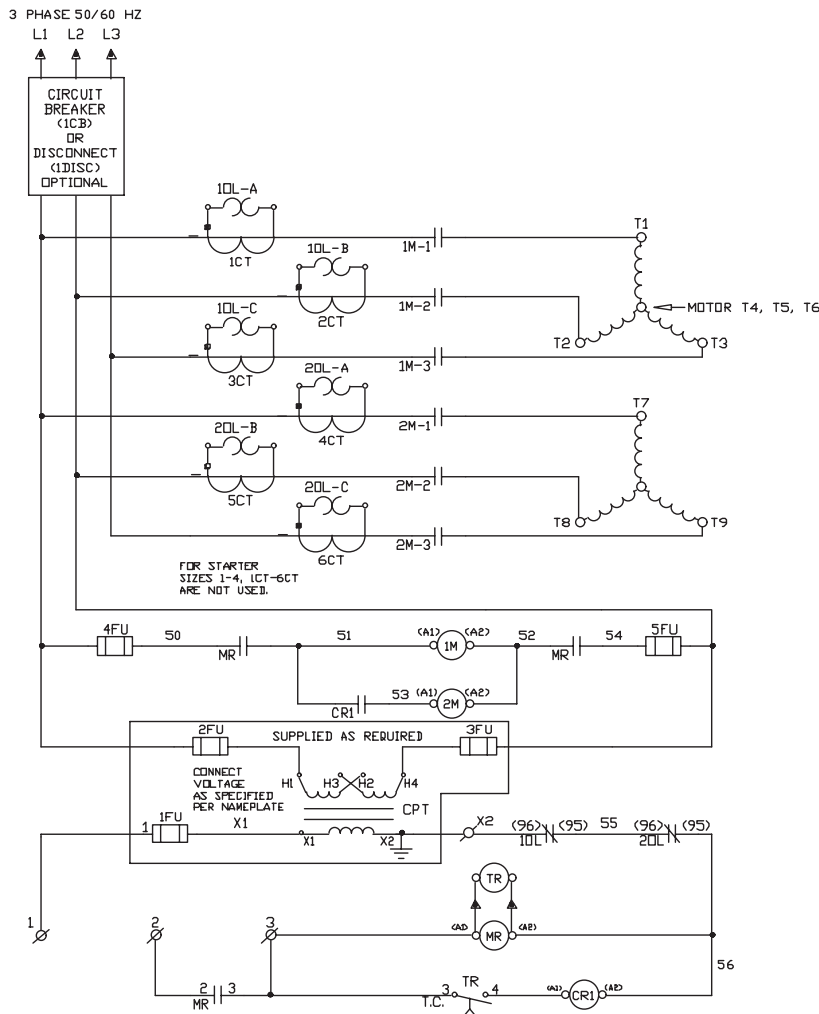
Note: For separate control voltage source, remove jumpers "A" and "B" and connect source to control fuse terminal. Remove jumper "C" if control transformer is used.

Reduced Voltage Starters & Pump Panels

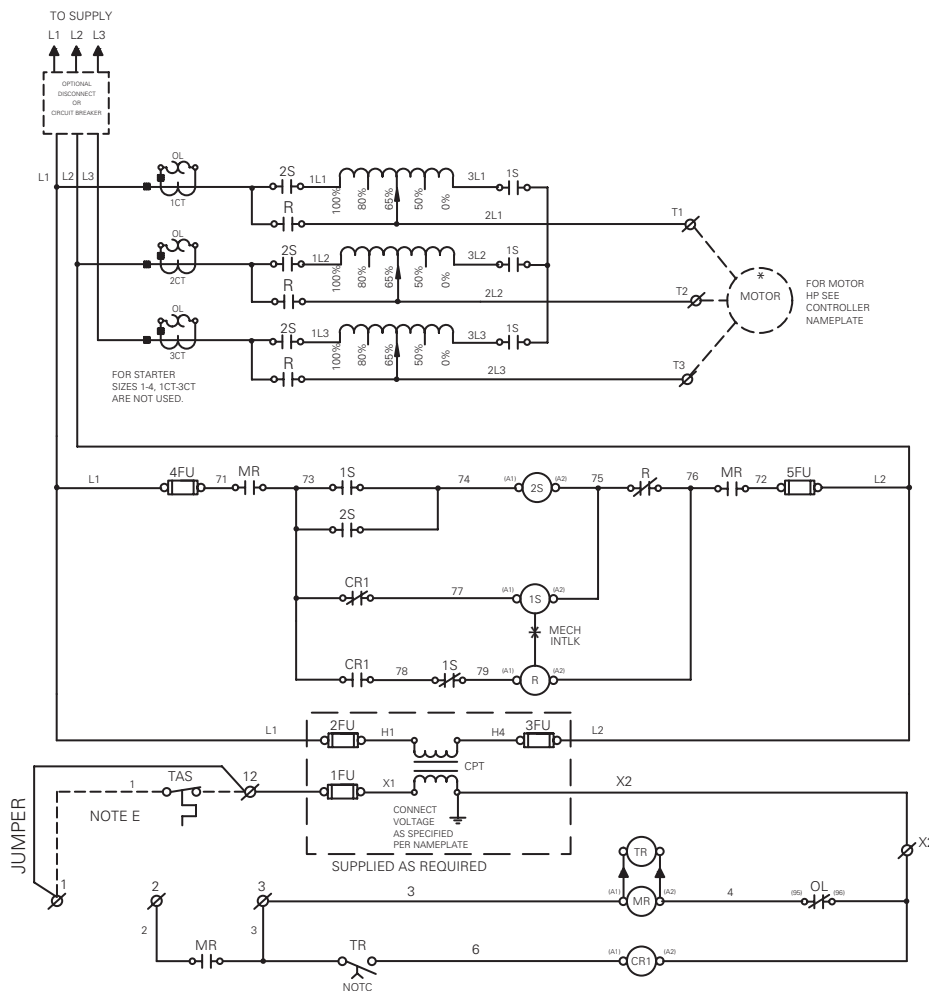
Class 36, 37, 88

Wiring Diagrams

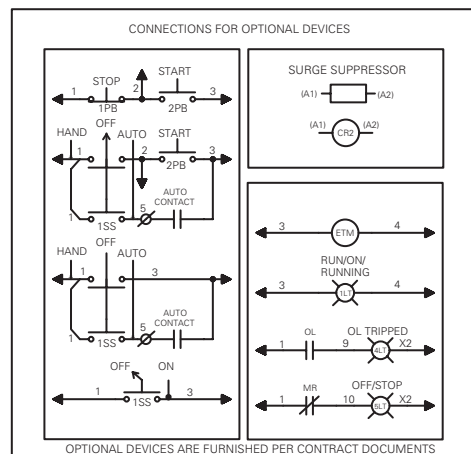
Part Winding



Auto Transformer



Note E:
Remove jumper if thermal protection switch is provided.

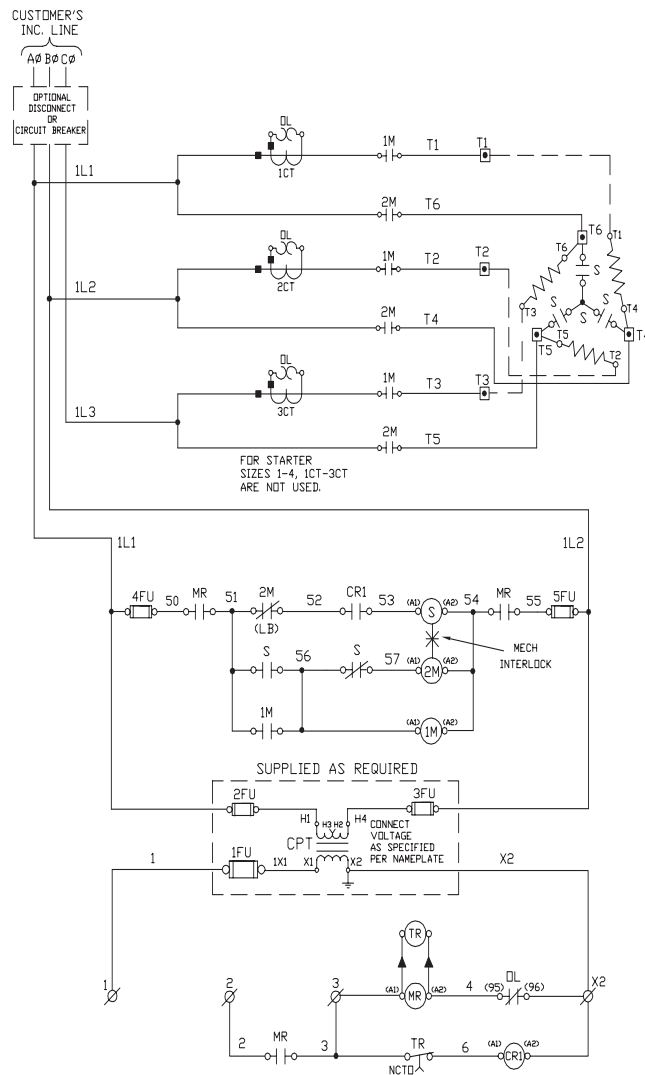


Reduced Voltage Starters & Pump Panels

Class 36, 37, 88

Wiring Diagrams

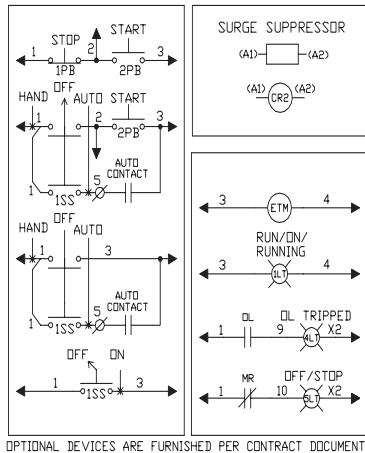
Wye Delta (Open Transition)



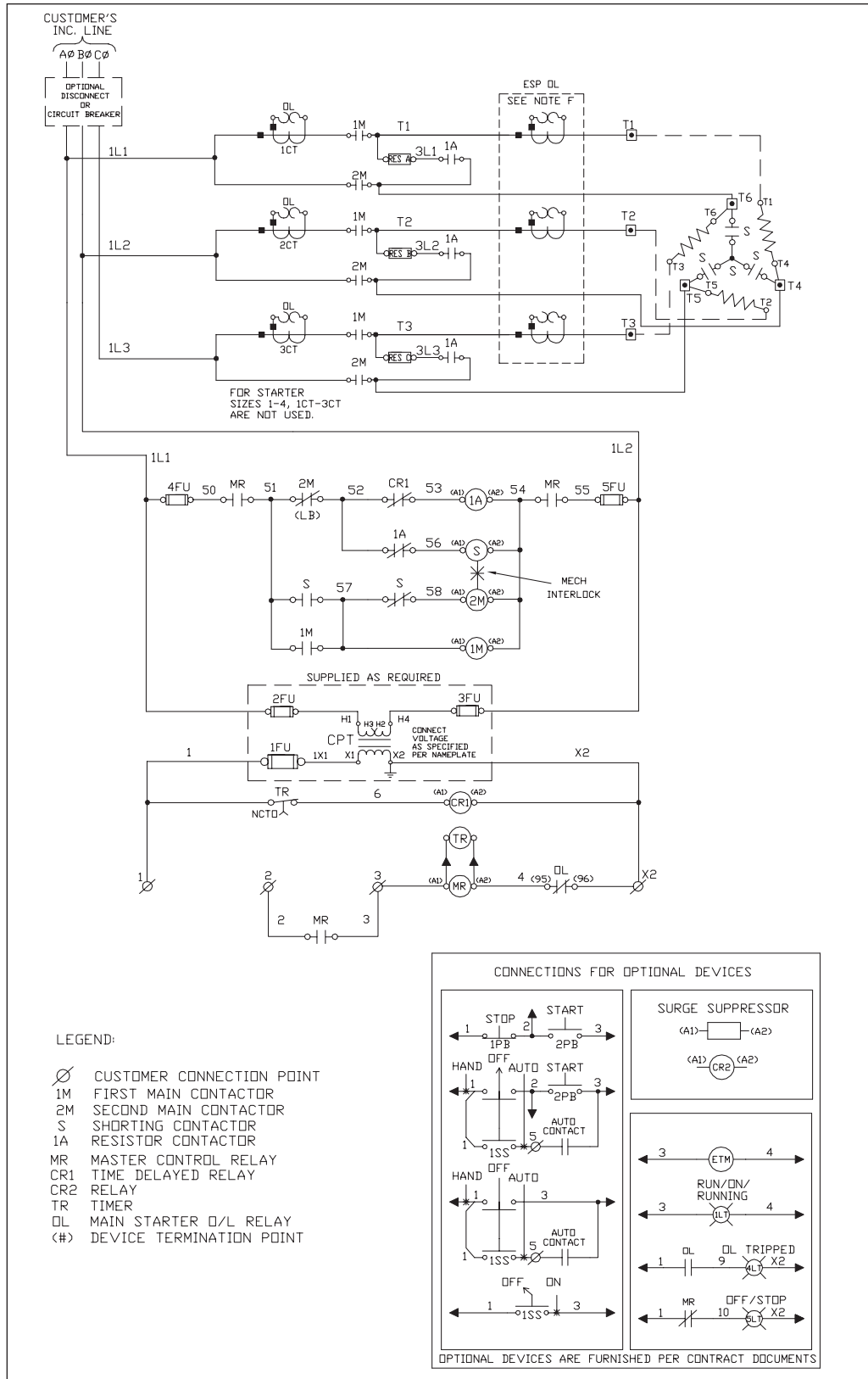
LEGEND:

- Ø CUSTOMER CONNECTION POINT
- 1M FIRST MAIN CONTACTOR
- 2M SECOND MAIN CONTACTOR
- S SHORTING CONTACTOR
- MR MASTER CONTROL RELAY
- CR1 TIME DELAYED RELAY
- CR2 RELAY
- TR TIMER
- DL MAIN STARTER O/L RELAY
- (#) DEVICE TERMINATION POINT

CONNECTIONS FOR OPTIONAL DEVICES



Wye Delta (Closed Transition)



Class 40, 43

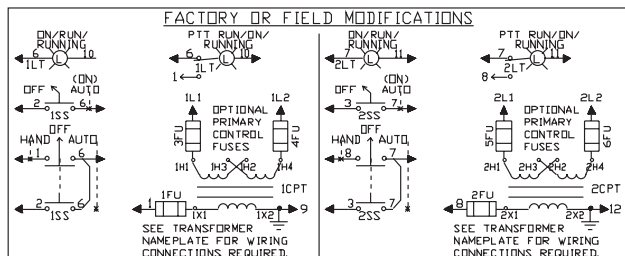
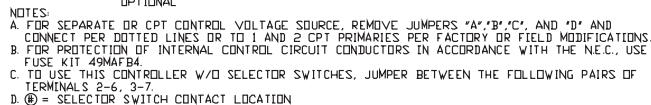
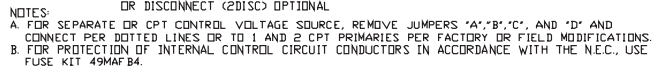
3-Phase Magnetic Contactors and Reversing Contactors

The diagram illustrates the electrical control circuit for a three-phase motor. At the top, three lines labeled L1, L2, and L3 are marked "TO SUPPLY". The circuit includes two main contactors: the "FWD" (Forward) contactor and the "REV" (Reverse) contactor. Each contactor has three main power contacts (L1, L2, L3) and two auxiliary contacts (A1, A2). A "MECHANICAL INTERLOCK" is shown between the A1 and A2 auxiliary contacts of the two contactors, preventing them from being closed simultaneously. The "FWD" contactor is connected to a "FWD" button (represented by a circle with 'F') and a "FWD" stop button (represented by a circle with 'X'). The "REV" contactor is connected to a "REV" button (represented by a circle with 'R') and a "REV" stop button (represented by a circle with 'X'). The main power contacts of both contactors are connected to the motor's three-phase supply (L1, L2, L3). A "CURRENT TRANSFORMER" is connected to the L1 line, and a "RELAY" is connected to the L2 line. The motor is represented by a circle labeled "LOAD". A note at the bottom right states: "REMOVE WIRE 'C' IF THE CONTACTOR COIL IS TO OPERATE ON A VOLTAGE OTHER THAN LINE VOLTAGE OR ON A SEPARATE CONTROL SOURCE." The diagram also shows a "C" terminal for the relay and a "B" terminal for the contactor.

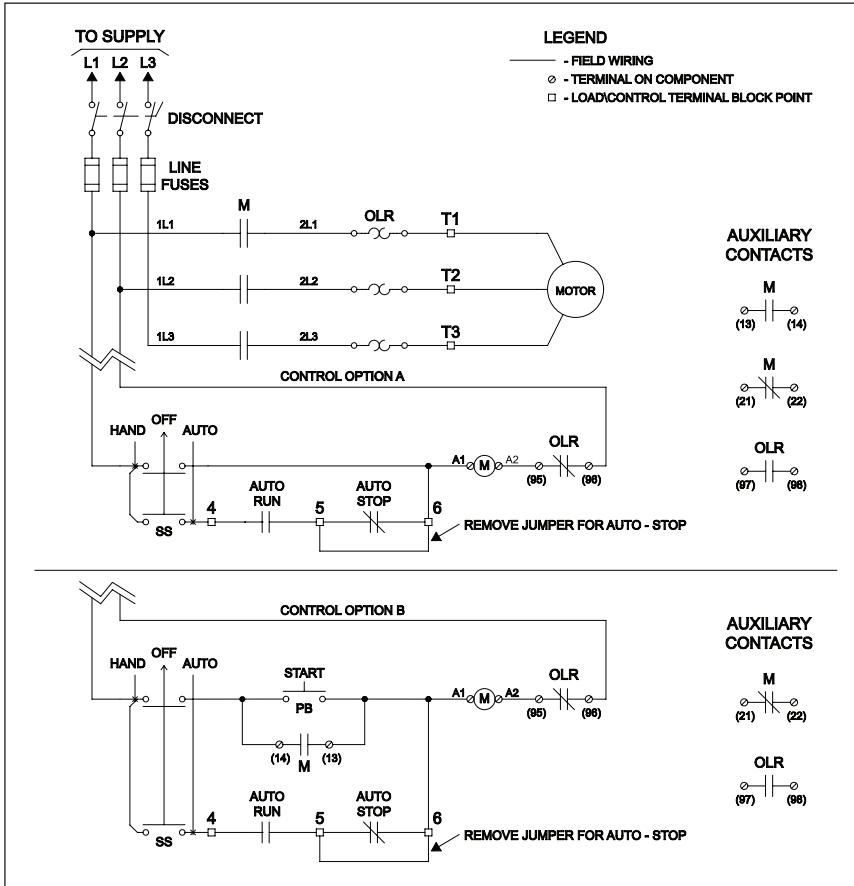
Wiring Diagrams

Wiring Diagrams

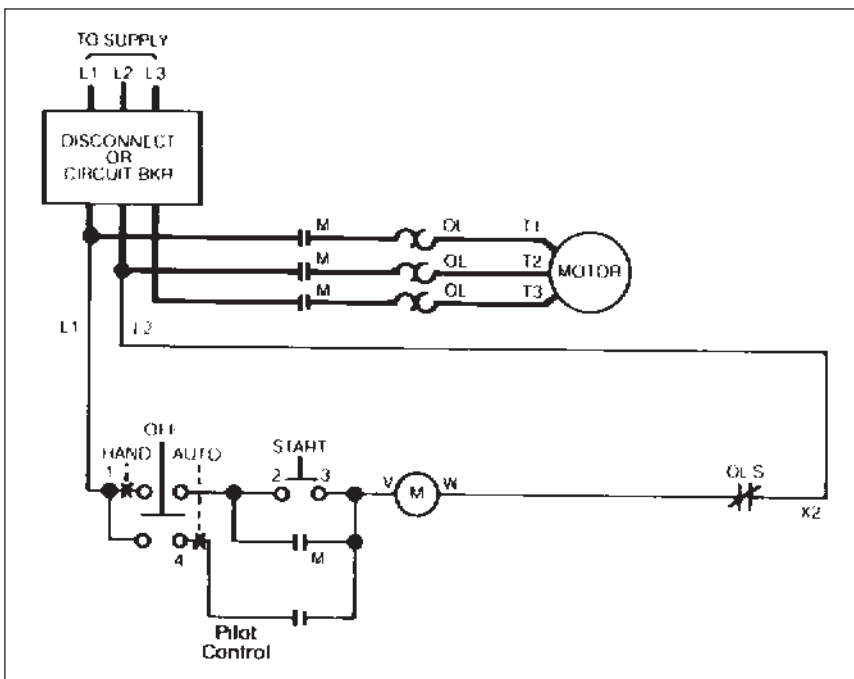
Duplex Panel with Lead Pump Transfer Switch (94)



Class 82 Pump Panel



Standard Class 87 Pump Panel

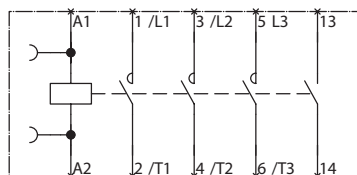


Duplex Heavy Duty Controllers

Class LC and LE Electrically Held Contactors

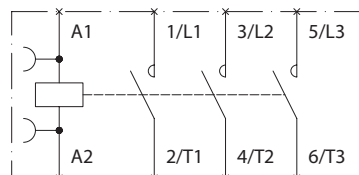
Wiring Diagrams

LEN00B003 (20A 3 Pole)

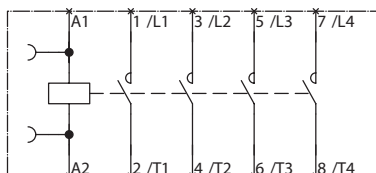


LEN00D003 (60A 3 Pole)

LEN00E003 (100A 3 Pole)



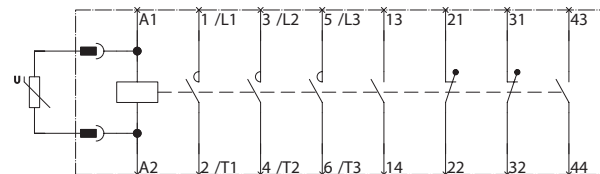
LEN00B004 (20A 4 Pole)



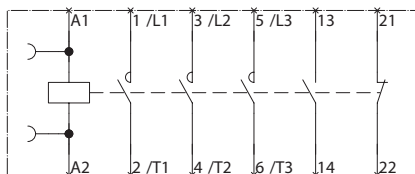
LEN00F003 (200A 3 Pole)

LEN00G003 (300A 3 Pole)

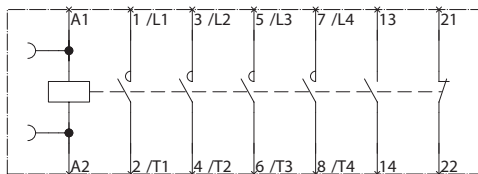
LEN00H003 (400A 3 Pole)



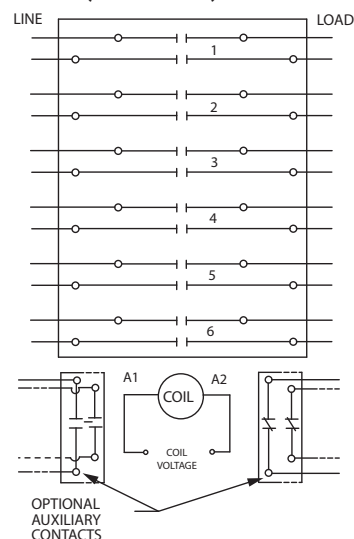
LEN00C003 (30A 3 Pole)

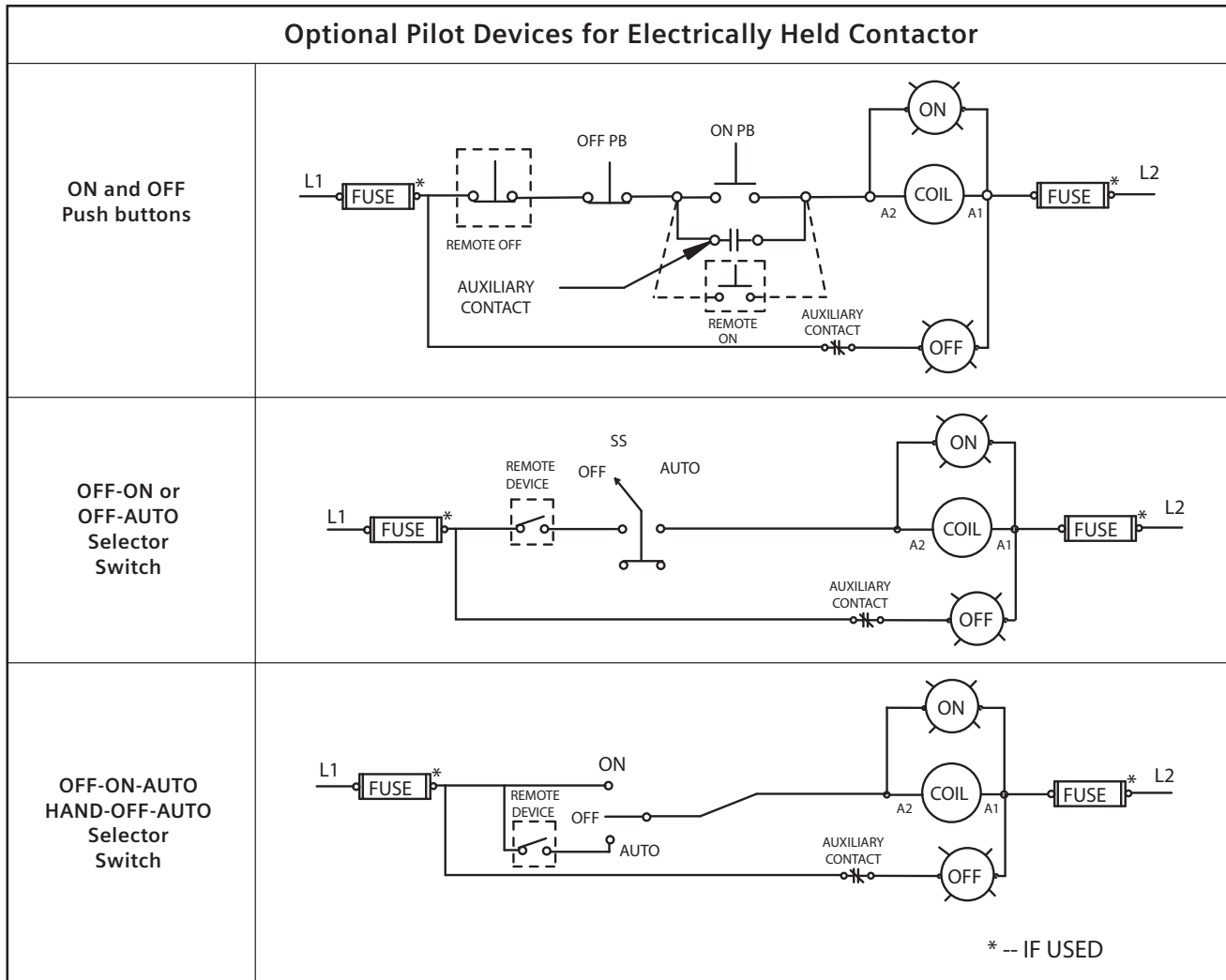


LEN00C004 (30A 4 Pole)



LCE00C (30A 2-12 Pole)

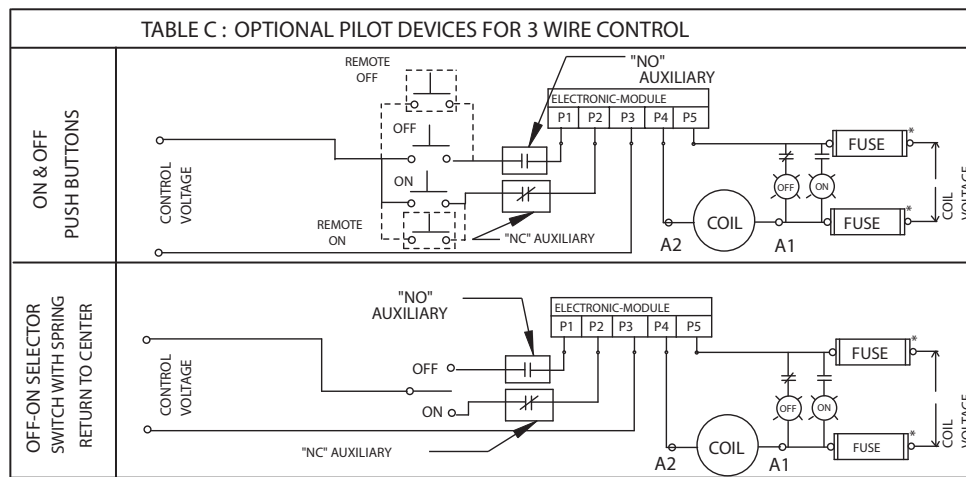
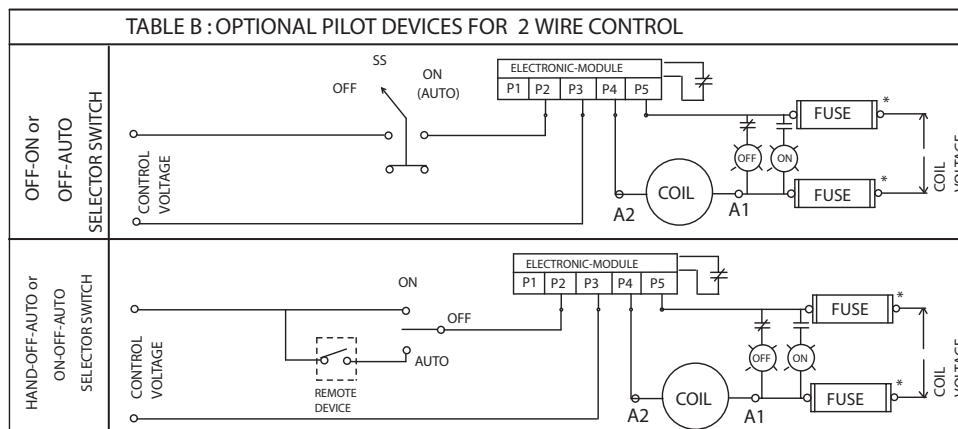
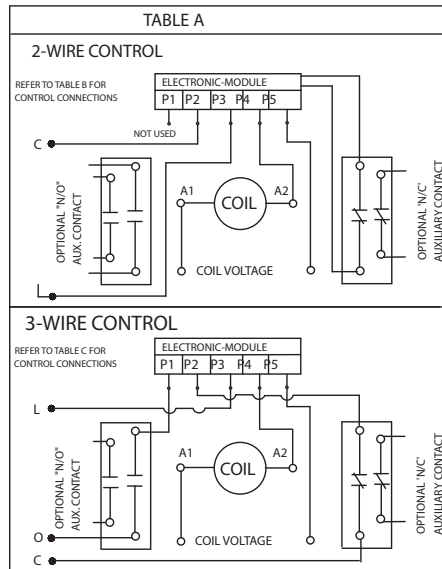
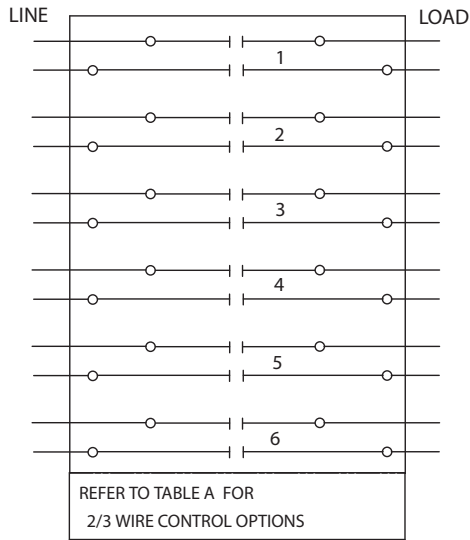




Lighting and Heating Contactors

Class LC (converted to mechanically held)

Wiring Diagrams

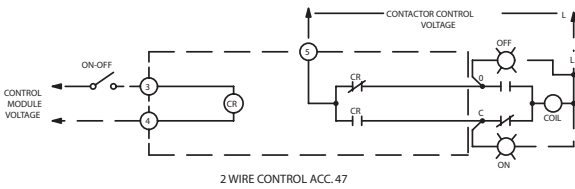
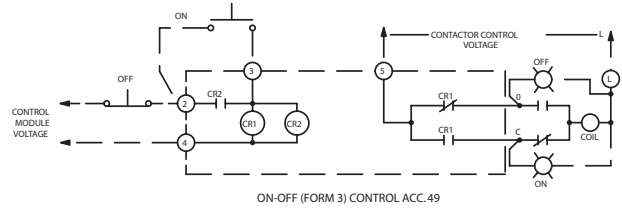
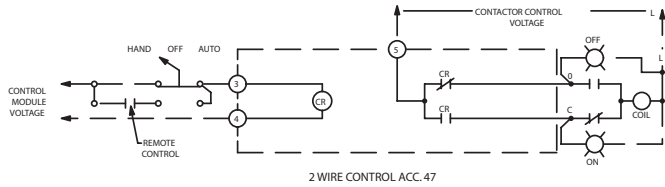
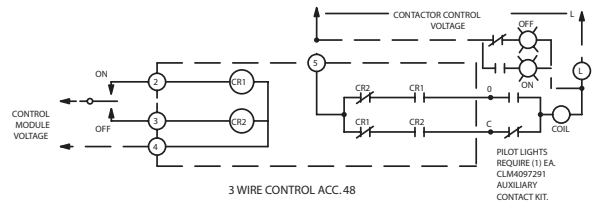
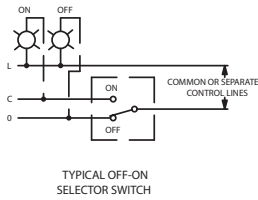


* -- IF USED

Lighting and Heating Contactors

Mechanically Latched 20 Amp, Class CLM

Wiring Diagrams



CONNECTIONS TO CONTROL MODULES	
MODULE TERMINAL	CONNECT TO:
1	NOT USED
2	CONT. STATION FOR ACC. 48 & 49
3	CONT. STATION FOR ACC. 47, 48 & 49
4	MODULE CONTROL VOLTAGE *
5	CONTACTOR CONTROL VOLTAGE
O	TERMINAL O ON CONTACTOR
C	TERMINAL C ON CONTACTOR

* FOR 24 VDC CONTROL MODULES
CONNECT TERMINAL 4 TO NEGATIVE (-)

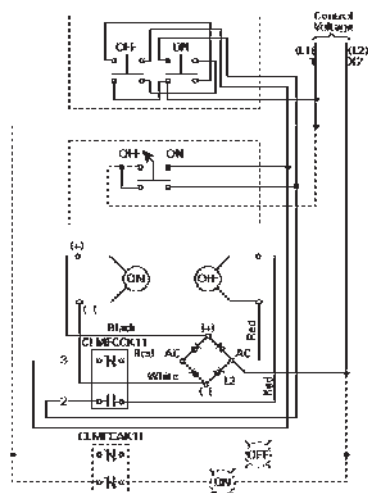
Lighting and Heating Contactors

Mechanically Latched 30-400 Amps, Class CLM

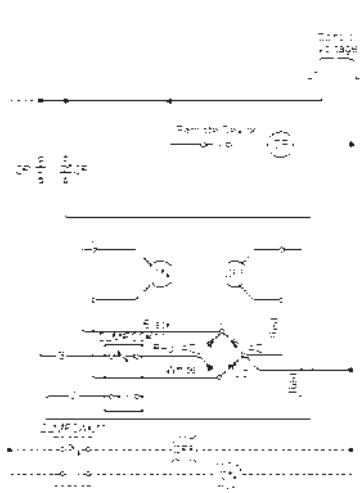
• Revised •
02/12/16

Wiring Diagrams

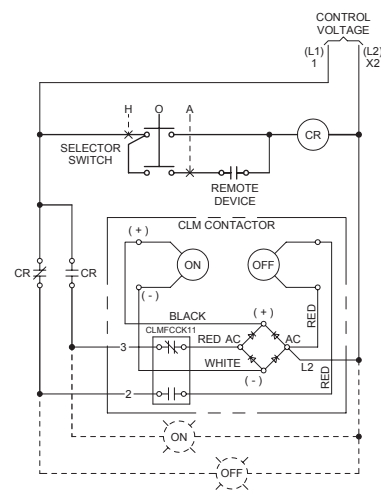
Mechanically Latched, CLM 30-200 Amps^①



Connection Diagram for Common/Separate Control with Momentary Pushbutton or ON-OFF Selector Switch **CLMOC**, **CLMOD**, **CLMOE**, and **CLMOF**

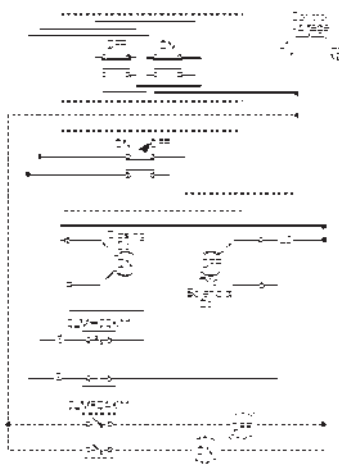


Connection for 2-Wire Control **CLMOC**, **CLMOD**, **CLMOE**, and **CLMOF**

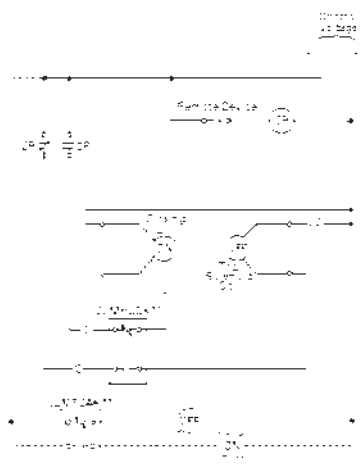


Connection for Hand/Off/Auto Control **CLMOC**, **CLMOD**, **CLMOE**, and **CLMOF**

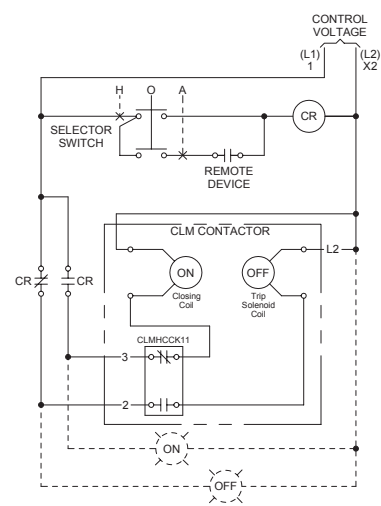
Mechanically Latched Type CLM 300 and 400 Amp^①



Connection Diagram for Common/Separate Control with Momentary Pushbutton or ON-OFF Selector Switch **CLMOG** and **CLMOH**



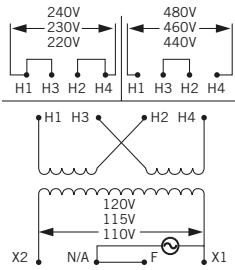
Connection for 2-Wire Control **CLMOG** and **CLMOH**



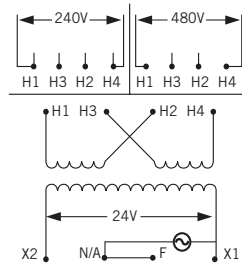
Connection for Hand/Off/Auto Control **CLMOG** and **CLMOH**

^① Control relay is required for 2-wire and Hand/Off/Auto Control, as shown in diagram.

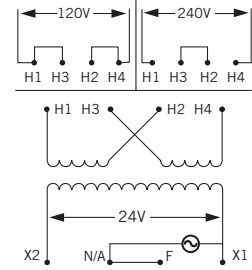
Voltage Letter A^{①③}



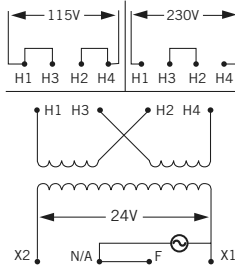
Voltage Letter B^{②③}



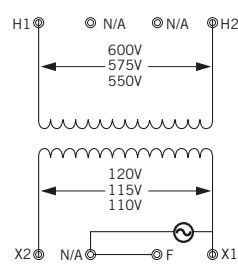
Voltage Letter C^{②③}



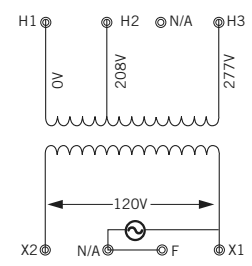
Voltage Letter D^②



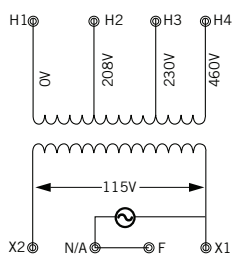
Voltage Letter E^{①③}



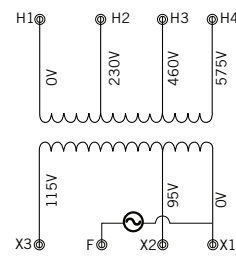
Voltage Letter F^①



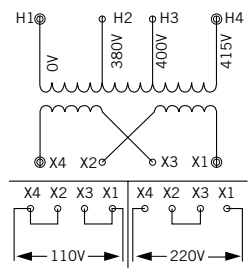
Voltage Letter G^①



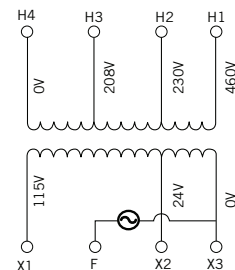
Voltage Letter H



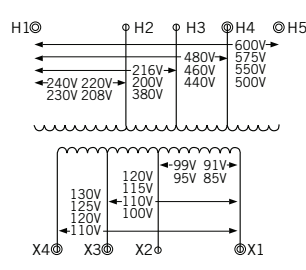
Voltage Letter I



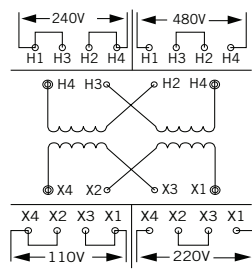
Voltage Letter J^{②③}



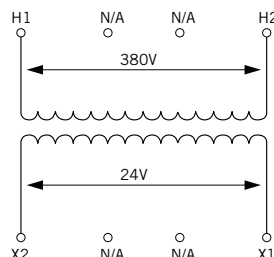
Voltage Letter L



Voltage Letter M^①



Voltage Letter P



① Includes secondary fuse clips on sizes 50-750VA
② Includes secondary fuse clips on sizes 50-500VA
③ Secondary fuse clips are not included on MTG transformers.

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Control and Signaling Devices

Push Button Units and Indicator Lights

• Revised •
07/15/16

16 mm mounting diameter, molded-plastic



3SB2

Page

Selection and ordering data

- | | |
|---|-------|
| • 3SB22 complete units | 10/7 |
| • 3SB20 pushbuttons and lens assemblies | 10/9 |
| • 3SB2 holders, lampholders and contact blocks | 10/11 |
| • 3SB29 inserts, legend plates, and accessories | 10/13 |

- | | |
|--------------------------|-------|
| Introduction | 10/4 |
| Technical specifications | 10/5 |
| Dimension drawings | 10/20 |

22 mm mounting diameter, plastic black



SIRIUS ACT - 3SU1

Page

Selection and ordering data

- | | |
|------------------------------------|-------------------------------------|
| • Complete units | 10/37 |
| • Compact units | 10/43 |
| • Actuating and signaling Elements | 10/45 |
| • Accessories | 10/102 – 10/109;
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22 mm mounting diameter, plastic with metal matte front ring



SIRIUS 3SB3, plastic round

Page

Selection and ordering data

- | | |
|------------------------------------|-------------------------------------|
| • Complete units | 10/57 |
| • Compact units | 10/63 |
| • Actuating and signaling Elements | 10/65 |
| • Accessories | 10/102 – 10/109;
10/122 – 10/143 |

22 mm mounting diameter, metal shiny



SIRIUS ACT - 3SU1

Page

Selection and ordering data

- | | |
|------------------------------------|-------------------------------------|
| • Complete units | 10/77 |
| • Compact units | 10/82 |
| • Actuating and signaling Elements | 10/85 |
| • Accessories | 10/102 – 10/109;
10/122 – 10/143 |

30 mm mounting diameter, metal matte



SIRIUS ACT - 3SU1

Page

Selection and ordering data

- | | |
|------------------------------------|-------------------------------------|
| • Actuating and signaling Elements | 10/95 |
| • Accessories | 10/118 – 10/120;
10/144 – 10/146 |

22mm enclosures and communication devices



SIRIUS ACT - 3SU1

Page

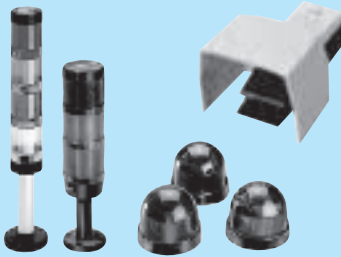
Selection and ordering data

- | | |
|----------------------|-------------------------------------|
| • Empty enclosures | 10/111 |
| • Complete enclosure | 10/112 |
| • AS-Interface | 10/116 |
| • Accessories | 10/118 – 10/120;
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| • Two-hand operation | 10/121 |

Control and Signaling Devices

Push Button Units and Indicator Lights

SIRIUS signal columns, built-in signal beacons and foot switches



3SE2, 3SE3 Foot Switches Page

Selection and ordering data

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Lamp & LED version, enclosure diameters 50 and 70 mm

- 8WD42 selection and accessories 10/154
- 8WD44 selection and accessories 10/115
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Standard duty control stations



Class 50 Page

Selection and ordering data

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- Heavy duty Type 4 10/170
- Class 50 accessories 10/171

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Type 7/9 hazardous location — 3/4"–14 NPSM



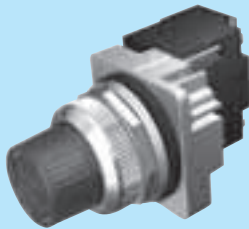
SIRIUS ACT – 3SU1 Page

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- Selector switches 10/177
- Push to test/illuminated push buttons 10/176
- Cam selection guide 10/179
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Technical Specifications	10/173

NEMA 30.5 mm mounting diameter, corrosion resistant, watertight & oiltight

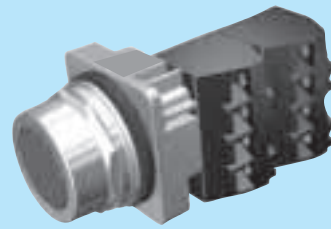


Class 52 Page

Selection and ordering data

- Momentary Push Button, Non-Illuminated 10/185-10/186
- 2 & 3 Position Push-Pull Mushroom Head Devices, Non-Illuminated 10/187-10/188
- 2 & 3 Position Push-Pull Mushroom Head Devices, Illuminated 10/189-10/190
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Class 52 Page

Selection and ordering data

- Push Button & Push-to-Test, Illuminated 10/195-10/196
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30.5 mm heavy duty control stations, Type 4/4X/12/13 enclosures



Class 52 Page

Selection and ordering data

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Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

General data

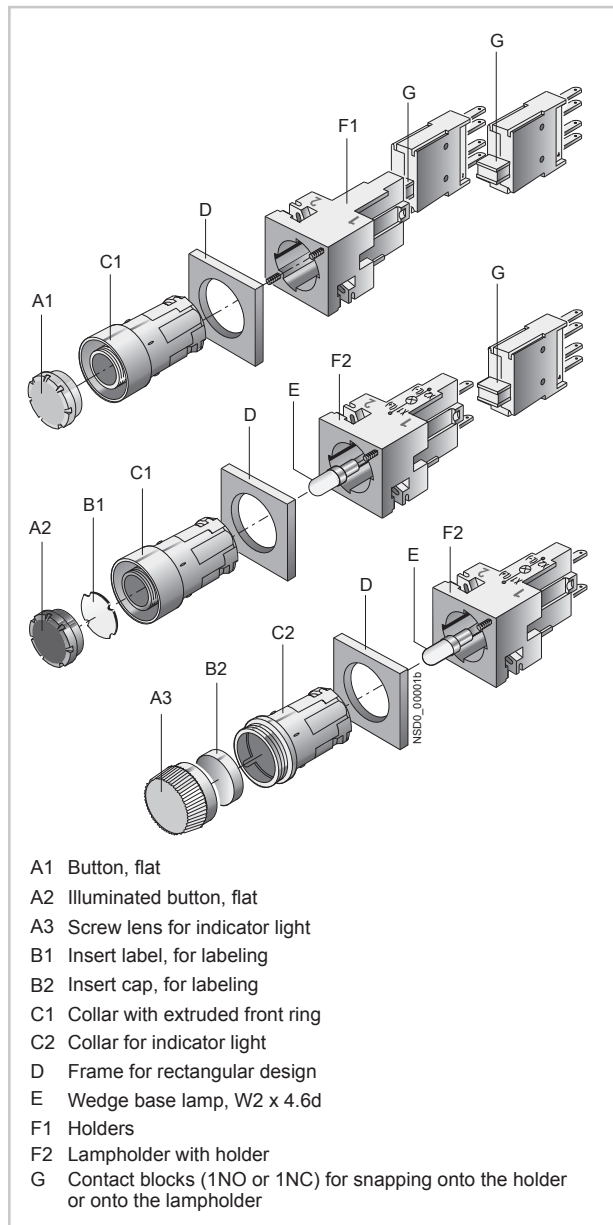
Overview

The 3SB2 push buttons and indicator lights are provided for front plate mounting and rear connection with flat connectors. For use on printed circuit boards, contact blocks and lamp holders with solder pins are also available.

Standards

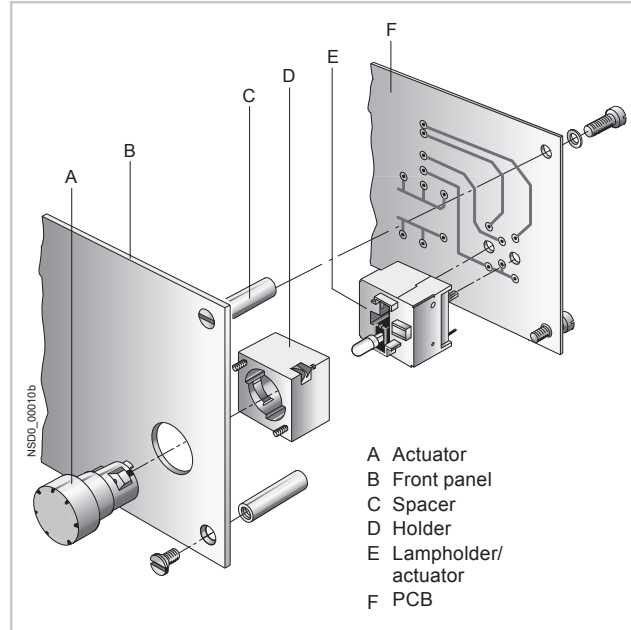
IEC 60947-1, EN 60947-1,
IEC 60947-5-1, EN 60947-5-1,
IEC 60947-5-5, EN 60947-5-5 for EMERGENCY-STOP mushroom push buttons.

Version with flat connector



For PCB mounting

For use on printed circuit boards, special contact blocks and lamp holders for soldering into the printed circuit board are available. For this purpose, the contact blocks and lamp holders are fitted with 0.8 mm x 0.8 mm solder pins of length 3.5 mm.



Connection methods



Flat connectors



Solder pin connections

The terminals are indicated in the corresponding tables by the symbols shown on blue backgrounds.

Application

The devices are climate-proof and suitable for marine applications.

Safety EMERGENCY-STOP push buttons according to ISO 13850

For controls according to IEC 60204-1 or EN 60204-1, the mushroom push buttons of the 3SB2 series are suitable for use as safety EMERGENCY-STOP push buttons.

Safety circuits

IEC 60947-5-1 and EN 60947-5-1 require positive opening, i.e. for the purposes of personal safety, the assured opening of NC contacts is expressly stipulated for the electrical equipment of machines in all safety circuits and marked according to IEC 60947-5-1 with the symbol ☞.

Category 4 according to EN 954-1 can be attained with the EMERGENCY-STOP mushroom push buttons if the corresponding failsafe evaluation units are selected and correctly installed, e.g. the 3TK28 safety relays or matching units from the ASIsafe, SIMATIC or SINUMERIK product ranges.

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

General data

1
2
3
4
5
6
7
8
9
10

Technical specifications

Type	3SB2	
Contact blocks and lamp holders		
Standards	IEC 60947-5-1, EN 60947-5-1 IEC 60947-5-5, EN 60947-5-5	
Rated insulation voltage U_i	V	250
Conventional thermal current I_{th}	A	10
Rated operational current I_e at rated operational voltage U_e		
• Alternating current AC-12 - At $U_e = 24 \dots 230$ V	A	10
• Alternating current AC-15 - At $U_e = 24 \dots 230$ V	A	4
• Direct current DC-12 - At $U_e = 24$ V	A	6
- At $U_e = 60$ V	A	5
- At $U_e = 110$ V	A	2.5
- At $U_e = 230$ V	A	1
• Direct current DC-13 - At $U_e = 24$ V	A	3
- At $U_e = 60$ V	A	1.5
- At $U_e = 110$ V	A	0.7
- At $U_e = 230$ V	A	0.3
Contact stability		
• Test voltage/test current	5 V/1 mA	
Lamps		
• Bases	Wedge base W2× 4.6 d	
• Rated voltage	V	6, 12, 24, 30, 48, 60
• Rated power, max.	W	1
Short-circuit protection weld-free according to IEC 60947-5-1		
• DIAZED fuse links, utilization category gG	10 A TDz, 16 A Dz	
• Miniature circuit breaker with C characteristic according to IEC 60898	10 A	
Electrical endurance		
• For utilization category AC-15 with 3RT10 15 to 3RT10 26 contactors	10 × 10 ⁶ operating cycles	
Mechanical endurance		
	10 × 10 ⁶ operating cycles	
Degree of protection acc. to IEC 60529		
• Connection of contact blocks and lamp holders behind the front panel	IP00	
• Contact chambers of the contact blocks behind the front panel	IP40	
Finger-safe according to IEC 61140 and BGV A3		
With voltages > 50 V AC or 120 V DC, insulation sleeves must be fitted to the unassigned tab connections.		
Data according to UL and CSA		
Rated voltage		
• Contact blocks	V	250 AC
• Indicator light (lamp with wedge base W2× 4.6 d)	V	60; 1 W
Uninterrupted current	A	5
Switching capacity	B 300, R 300	
Actuators and indicators		
Mechanical endurance		
• Push Buttons	10 × 10 ⁶ operating cycles	
• Actuators, rotary or maintained	3 × 10 ⁵ operating cycles	
• Illuminated push buttons	3 × 10 ⁶ operating cycles	
Climatic withstand capability		
Climate-proof; suitable for marine applications		
Ambient temperature		
• During operation, non-illuminated devices and complete with LED	°C	−25 ... +70
• During operation, devices with incandescent lamp	°C	−25 ... +60
• During storage, transport	°C	−40 ... +80
Degree of protection acc. to IEC 60529		
• Actuators and indicators	IP65	
• Actuators and indicators with protective cap	IP67	
Protective measures		
• For mounting in metal front plates and enclosures	The actuators and lens assemblies must not be included in the protective measures.	
• For fitting into enclosures with total insulation	The protective measure "Total insulation" is retained.	
Shock resistance acc. to IEC 60068-2-27		
• Shock amplitude	ms	≤ 50 g
• Shock duration		11
• Shock form		Half-sine

More technical information [see Reference manual "Commanding and Signaling Devices"](#).

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

General data

Configuration

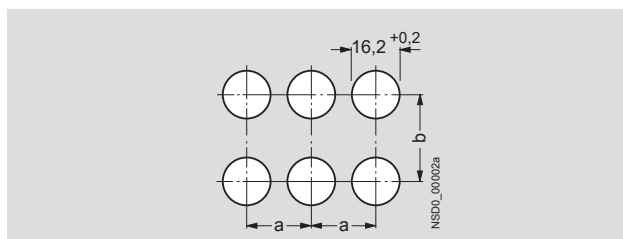
Design

Two design versions can be mounted:

- Round design: The 3SB2 push buttons and indicator lights are assembled with the modules – actuator, holder, contact block and lamp holder. Depending on the specific application, various versions can be assembled. Complete units are offered for the most commonly used applications.
- Square design: With square, black frames the round units can be given a square look. The frames are inserted underneath the round actuators. Further mounting is the same as for the round version.

Mounting and fixing:

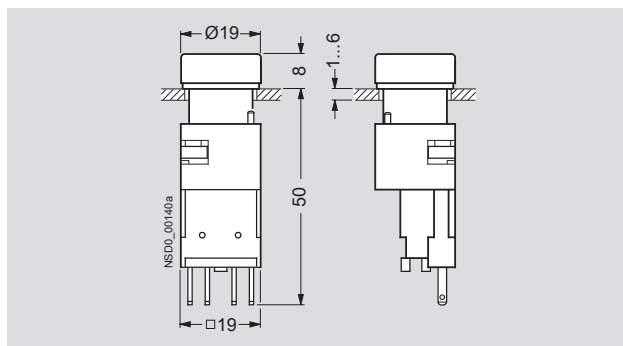
Mounting dimensions according to EN 50007
(not applicable to EMERGENCY-STOP mushroom push buttons)



Minimum clearance	a	b
Round version	19	19
Square version without inscription label	21	21
Round and square version with inscription label	21	32
For 2 selector switches with 3 switch positions, maintained, side by side	21	21

For mounting, the actuator or the lens assembly is inserted from the front into the hole in the front plate. Four small nubs ensure a secure fitting in the hole. The holder is plugged on from the back and snaps automatically into place. The module is fixed to the holder with 2 screws so that it is immune to vibrations.

One or two contact blocks can be mounted on the holder. They are inserted into the holder with slide slots and held down with two snap brackets.



Push button (flat) with holder and contact block

If a command point is fitted with an indicator light or illuminated push button, a lamp socket with lamp holder must be used instead of a holder. It is suitable for incandescent lamps or LEDs with bases of type W2 × 4.6d.

For PCB mounting

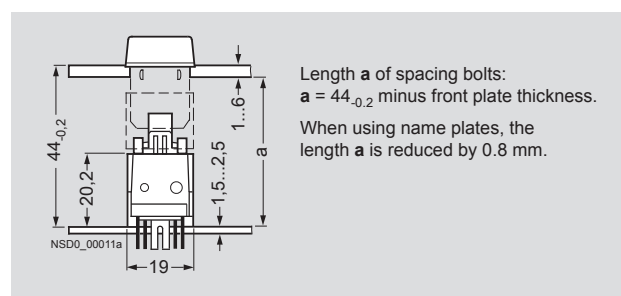
The command point comprises the actuator – e.g. 3SB2 push button, illuminated push button or indicator light –, which is mounted in the front plate, and a contact block and a lamp holder which are soldered to the PCB. For this purpose, the contact blocks and lamp holders are fitted with 0.8 mm × 0.8 mm solder pins of length 3.5 mm.

Mounting and fixing:

Mounting dimensions according to EN 50007.

The actuators are mounted in the same way as 3SB2 front plate mounting devices.

The contact blocks and lamp holders are plugged into the printed circuit board by means of their solder pins and can be flow-soldered. After soldering, the devices must be flush with the board and perpendicular to it. The printed circuit board must be supported on spacing bolts so that it cannot sag or bend more than 0.1 mm.

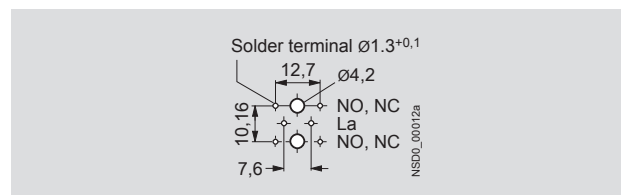


Illuminated push button with solder pin connection

To avoid bending the PCB when the control device is operated, sufficient spacing bolts must be provided as shown in the table below:

PCB thickness	Max. distance between spacing bolts
1.5 mm	80 mm
2.5 mm	150 mm
When using EMERGENCY-STOP push buttons	always 50 mm

These details are based on epoxy resin glass fiber mat.



Solder pin spacing

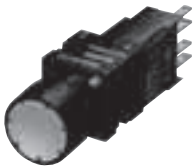


Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Complete units

1
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Selection and ordering data

	Version	Contact blocks	DT	Color of handle	Flat connectors	PS
					Order No.	
 Pushbutton with flat button	Push buttons with flat button	1 NO		Black	3SB22 02-0AB01	1 unit
		1 NC		Black	3SB22 03-0AB01	1 unit
		1 NC		Red	3SB22 03-0AC01	1 unit
		1 NO		Yellow	3SB22 02-0AD01	1 unit
		1 NO		Green	3SB22 02-0AE01	1 unit
		1 NO		Blue	3SB22 02-0AF01	1 unit
		1 NO		White	3SB22 02-0AG01	1 unit
		1 NO		Clear ¹⁾	3SB22 02-0AH01	1 unit
		1 NC		Red	3SB22 07-0AC01	1 unit
		1 NO		Yellow ¹⁾	3SB22 06-0AD01	1 unit
 Illuminated push button with raised button	Illuminated push buttons with flat button Lamp holder W2 x 4.6 d ²⁾	1 NO		Green	3SB22 06-0AE01	1 unit
		1 NO		Blue	3SB22 06-0AF01	1 unit
		1 NO		Clear ¹⁾	3SB22 06-0AH01	1 unit
		1 NC		Red	3SB22 27-0AC01	1 unit
		1 NO		Yellow ¹⁾	3SB22 26-0AD01	1 unit
		1 NO		Green	3SB22 26-0AE01	1 unit
		1 NO		Blue	3SB22 26-0AF01	1 unit
		1 NO		Clear ¹⁾	3SB22 26-0AH01	1 unit
		1 NC		Red	3SB22 02-0LB01	1 unit
		1 NC		Red	3SB22 03-0LC01	1 unit
 EMERGENCY-STOP mushroom push button	Push buttons with raised button	1 NO		Yellow	3SB22 02-0LD01	1 unit
		1 NO		Blue	3SB22 02-0LF01	1 unit
		1 NO		Clear ¹⁾	3SB22 02-0LH01	1 unit
		1 NC		Red	3SB22 07-0LC01	1 unit
		1 NO		Yellow ¹⁾	3SB22 06-0LD01	1 unit
		1 NO		Green	3SB22 06-0LE01	1 unit
		1 NO		Blue	3SB22 06-0LF01	1 unit
		1 NO		Clear ¹⁾	3SB22 06-0LH01	1 unit
		1 NC		Red	3SB22 27-0LC01	1 unit
		1 NO		Yellow ¹⁾	3SB22 26-0LD01	1 unit
 EMERGENCY-STOP mushroom push button	Illuminated push buttons with raised button Lamp holder W2 x 4.6 d ²⁾	1 NO		Green	3SB22 26-0LE01	1 unit
		1 NO		Blue	3SB22 26-0LF01	1 unit
		1 NO		Clear ¹⁾	3SB22 26-0LH01	1 unit
		1 NC		Red	3SB22 03-1AC01	1 unit
		1 NO		Yellow ¹⁾		
		1 NO		Green		
		1 NO		Blue		
		1 NO		Clear ¹⁾		
		1 NC		Red		
		1 NO		Yellow ¹⁾		

¹⁾ Inscription is possible by inserting a label.

²⁾ For wedge base lamps see "Accessories", page 10/18.




³⁾ The mushroom push button cannot be combined with 3SB29 02-0AB name plate or 3SB29 02-0AA single frame.




⁴⁾ Positive opening according to IEC 60947-5-1, Appendix K.


Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Complete units

	Version	Contact blocks	Color of handle	DT	Flat connectors	PS
					Order No.	
	Selector switches, 2 switch positions Switching sequence O-I, 62° operating angle, maintained	1 NO	Black		3SB22 02-2AB01 3SB22 02-2AC01 3SB22 02-2AE01 3SB22 02-2AG01	1 unit
		1 NO	Red			1 unit
		1 NO	Green			1 unit
		1 NO	White			1 unit
	Selector switches, 3 switch positions Switching sequence I-O-II, 2 × 62° operating angle, maintained	1 NO, 1 NO	Black		3SB22 10-2DB01 3SB22 10-2DC01 3SB22 10-2DE01 3SB22 10-2DG01	1 unit
		1 NO, 1 NO	Red			1 unit
		1 NO, 1 NO	Green			1 unit
		1 NO, 1 NO	White			1 unit
	Selector switches, 3 switch positions Switching sequence I-O-II, 2 × 50° operating angle, momentary, Spring return from left and right	1 NO, 1 NO	Black		3SB22 10-2EB01 3SB22 10-2EC01 3SB22 10-2EE01 3SB22 10-2EG01	1 unit
		1 NO, 1 NO	Red			1 unit
		1 NO, 1 NO	Green			1 unit
		1 NO, 1 NO	White			1 unit

	Version	Contact blocks	Lock No.	Key removal position	DT	Flat connectors	PS
						Order No.	
	CES key-operated switches, 2 switch positions Switching sequence O-I, 62° operating angle, maintained	1 NO	SB2	O		3SB22 02-4LA01 3SB22 02-4LB01	1 unit
		1 NO	SB2	O + I			1 unit
	CES key-operated switches, 3 switch positions Switching sequence I-O-II, 2 × 62° operating angle, maintained	1 NO, 1 NO	SB2	O		3SB22 10-4PA01 3SB22 10-4PB01	1 unit
		1 NO, 1 NO	SB2	I + O + II			1 unit
	CES key-operated switches, 3 switch positions Switching sequence I-O-II, 2 × 50° operating angle, momentary, Spring return from left and right	1 NO, 1 NO	SB2	O		3SB22 10-4QA01	1 unit

	Version	Color of screw lens	DT	Flat connectors	PS
				Order No.	
	Indicator lights Lamp holder W2 x 4.6 d without lamp ¹⁾	Red		3SB22 04-6BC06 3SB22 04-6BD06 3SB22 04-6BE06 3SB22 04-6BG06 3SB22 04-6BH06	1 unit
		Yellow			1 unit
		Green			1 unit
		White			1 unit
		Clear			1 unit
	Indicator lights Lamp holder W2 x 4.6 d with incandescent lamp 24 V	Red		3SB22 24-6BC06 3SB22 24-6BD06 3SB22 24-6BE06 3SB22 24-6BG06 3SB22 24-6BH06	1 unit
		Yellow			1 unit
		Green			1 unit
		White			1 unit
		Clear			1 unit

¹⁾ For wedge base lamps see "Accessories", page 10/18.






Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Actuators and indicators








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Selection and ordering data

	Version	Color of handle	DT	Order No.	PS
Push buttons					
	Push buttons with flat button	Black		3SB20 00-0AB01	1 unit
		Red		3SB20 00-0AC01	1 unit
		Yellow		3SB20 00-0AD01	1 unit
		Green		3SB20 00-0AE01	1 unit
		Blue		3SB20 00-0AF01	1 unit
		White		3SB20 00-0AG01	1 unit
		Clear ¹⁾		3SB20 00-0AH01	1 unit
	Illuminated push buttons with flat button	Red		3SB20 01-0AC01	1 unit
		Yellow ¹⁾		3SB20 01-0AD01	1 unit
		Green		3SB20 01-0AE01	1 unit
		Blue		3SB20 01-0AF01	1 unit
		White		3SB20 00-0AG01	1 unit
		Clear ¹⁾		3SB20 00-0AH01	1 unit
			Push buttons with raised button	Black	
Red				3SB20 00-0LC01	1 unit
Yellow				3SB20 00-0LD01	1 unit
Blue				3SB20 00-0LF01	1 unit
White				3SB20 00-0LG01	1 unit
Clear ¹⁾				3SB20 00-0LH01	1 unit
	Illuminated push buttons with raised button			Red	
		Yellow ¹⁾		3SB20 01-0LD01	1 unit
		Green		3SB20 01-0LE01	1 unit
		Blue		3SB20 01-0LF01	1 unit
		Clear ¹⁾		3SB20 00-0LH01	1 unit
	EMERGENCY-STOP mushroom push buttons acc. to ISO 13850, maintained ²⁾	Red		3SB20 00-1AC01	1 unit
		Latches automatically when pressed; unlatches by turning the mushroom head anticlockwise			

¹⁾ Inscription is possible by inserting a label.







²⁾ The mushroom push button cannot be combined with 3SB29 02-0AB name plate or 3SB29 02-0AA single frame.

Version		Color of handle	DT	Order No.	PS
Selector switches					
 Selector switch	Selector switches with 2 switch positions Switching sequence O-I, 62° operating angle, maintained		Black Red Green White	3SB20 00-2AB01 3SB20 00-2AC01 3SB20 00-2AE01 3SB20 00-2AG01	1 unit 1 unit 1 unit 1 unit
	Selector switches with 2 switch positions Switching sequence O-I, 50° operating angle, momentary, spring return from right		Black Red Green	3SB20 00-2BB01 3SB20 00-2BC01 3SB20 00-2BE01	1 unit 1 unit 1 unit
	Selector switches with 2 switch positions Switching sequence O-I, 90° operating angle, maintained		Black Red Green White	3SB20 00-2HB01 3SB20 00-2HC01 3SB20 00-2HE01 3SB20 00-2HG01	1 unit 1 unit 1 unit 1 unit
	Selector switches with 3 switch positions Switching sequence I-O-II, 2 x 62° operating angle, maintained		Black Red Green White	3SB20 00-2DB01 3SB20 00-2DC01 3SB20 00-2DE01 3SB20 00-2DG01	1 unit 1 unit 1 unit 1 unit
	Selector switches with 3 switch positions Switching sequence I-O-II, 2 x 50° operating angle, momentary, spring return from left and right		Black Red Green White	3SB20 00-2EB01 3SB20 00-2EC01 3SB20 00-2EE01 3SB20 00-2EG01	1 unit 1 unit 1 unit 1 unit
	Selector with 3 switch positions Switching sequence I-O-II, 2 x 90° operating angle, maintained		Black	3SB20 00-2JB01	1 unit

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Actuators and indicators

Version		Lock No.	Key removal position	DT	Order No.	PS
Key-operated switches						
 CES key-operated switch	CES key-operated switches with 2 keys, 2 switch positions Switching sequence O-I, 62° operating angle, maintained		SB2	O+I O	3SB20 00-4LB01 3SB20 00-4LA01	1 unit 1 unit
	CES key-operated switches with 2 keys, 2 switch positions Switching sequence O-I, 50° operating angle, momentary, spring return from right		SB2	O	3SB20 00-4MA01	1 unit
	CES key-operated switches with 2 keys, 3 switch positions Switching sequence I-O-II, 2 x 62° operating angle, maintained		SB2	I+O+II O	3SB20 00-4PB01 3SB20 00-4PA01	1 unit 1 unit
	CES key-operated switches with 2 keys, 3 switch positions Switching sequence I-O-II, 2 x 50° operating angle, momentary, spring return from left and right		SB2	O	3SB20 00-4QA01	1 unit
Version		Color of screw lens		DT	Order No.	PS
Indicator lights						
 Indicator light	Indicator lights with concentric rings (inscription by inserting a cap is not possible)	Red Yellow Green Blue White Clear		3SB20 01-6BC06 3SB20 01-6BD06 3SB20 01-6BE06 3SB20 01-6BF06 3SB20 01-6BG06 3SB20 01-6BH06	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit	
	Indicator lights, smooth for inscription by inserting a cap ¹⁾	Red Yellow Green Blue Clear		3SB20 01-6CC06 3SB20 01-6CD06 3SB20 01-6CE06 3SB20 01-6CF06 3SB20 01-6CH06	1 unit 1 unit 1 unit 1 unit 1 unit	

¹⁾ Insert caps, see "Accessories", page 10/15




Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Contact blocks and lampholders

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Selection and ordering data

Version	Diagram	Operating travel	DT	Flat connectors	PS
		 Contact closed  Contact open			
				Order No.	

Contact blocks and lamp holders with flat connectors 2 x 2.8 – 0.8 mm according to IEC 60760

Holders for fixing the actuator and the contact blocks

Holders for 2 contact blocks
Inscription with identification number 1-2



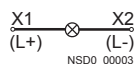
Holder

3SB29 08-0AA 5 units

Lamp holders with holder for fixing the actuator and the contact blocks

Lamp holders

W2 x 4.6 d
without lamp

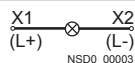


3SB23 04-2A 1 unit

Lamp holders

W2 x 4.6 d

- With 6 V incandescent lamp
- With 24 V incandescent lamp



3SB23 04-2F 1 unit

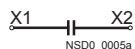
3SB23 04-2H 1 unit



Lamp holder

Voltage reducers¹⁾

For connecting the 3SB29 08-1AE lamp (48 V) to 230 V AC



3SB24 04-3D 1 unit

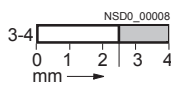


Voltage reducer

Contact blocks for fixing in the holder or lamp holder

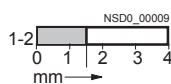
Contact blocks with one contact²⁾

1 NO

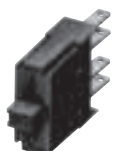


3SB24 04-0B 1 unit

1 NC ³⁾



3SB24 04-0C 1 unit



Contact block

¹⁾ Use fixpoint terminal according to IEC 60439-1.


²⁾ For plug-in and insulation sleeves see "Accessories", page 10/19.

³⁾ Positive opening according to IEC 60947-5-1, Appendix K.

Push Button Units and Indicator Lights

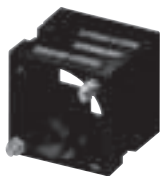
3SB2, Mounting Diameter 16 mm

Contact blocks and lamp holders

Version	Diagram	Operating travel	DT	Solder pin connections	PS
		<div style="border: 1px solid black; width: 10px; height: 10px; display: inline-block;"></div> Contact closed <div style="border: 1px solid black; width: 10px; height: 10px; display: inline-block; background-color: white;"></div> Contact open			

Order No.

Contact blocks and lamp holders with solder pins



Holder

Holders for contact block with solder pins

For fixing the actuators in the front panel

Lamp holders

Wedge base W2 x 4.6 d¹⁾



3SB29 08-0AB 5 units

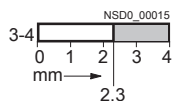
3SB24 55-2A 1 unit



Contact block with solder pins

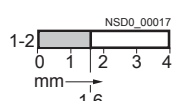
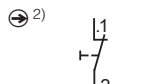
Contact blocks

1 NO



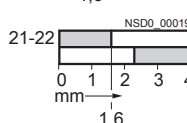
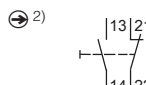
3SB24 55-0B 1 unit

1 NC



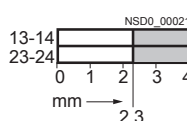
3SB24 55-0C 1 unit

1 NO + 1 NC



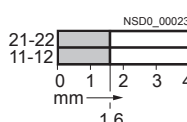
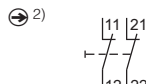
3SB24 55-0J 1 unit

1 NO + 1 NO



3SB24 55-0E 1 unit

1 NC + 1 NC



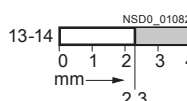
3SB24 55-0F 1 unit



Contact block and lamp holder with solder pins

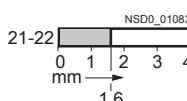
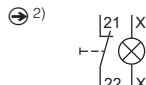
Contact blocks and lamp holders, wedge base W2 x 4.6 d¹⁾

1 NO



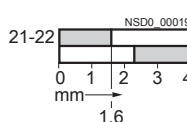
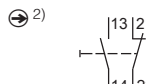
3SB24 55-1B 1 unit

1 NC



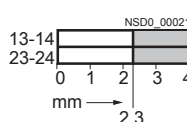
3SB24 55-1C 1 unit

1 NO + 1 NC



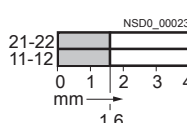
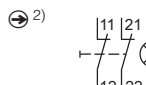
3SB24 55-1J 1 unit

1 NO + 1 NO



3SB24 55-1E 1 unit

1 NC + 1 NC



3SB24 55-1F 1 unit

¹⁾ The lamp is not included in the scope of supply.

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Insert labels and insert caps

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Overview

Clear push buttons, illuminated push buttons and indicator lights can be fitted with insert labels and caps for identification purposes.







The insert labels and insert caps are made of a milky-transparent plastic with black lettering; they can be fitted in any 90° angle.

Inscriptions

The inscriptions have upper case initial letters. Graphic symbols, including those not listed in the catalog, are according to ISO 7000 or IEC 60417.

For customized inscriptions see "Options".


























Selection and ordering data

Inscription/Symbol	Symbol No.	DT	Insert labels For push buttons and illuminated push buttons, flat Order No.	PS
For self-inscription				
 Blank			3SB29 01-4AA	10 units
With inscription				
 On			3SB29 01-4EB	10 units
Start			3SB29 01-4EK	10 units
Stop			3SB29 01-4EL	10 units
Reset			3SB29 01-4EM	10 units
Test			3SB29 01-4EN	10 units
0			3SB29 01-4RA	10 units
1			3SB29 01-4RB	10 units
2			3SB29 01-4RC	10 units
3			3SB29 01-4RD	10 units
4			3SB29 01-4RE	10 units
5			3SB29 01-4RF	10 units
6			3SB29 01-4RG	10 units
7			3SB29 01-4RH	10 units
8			3SB29 01-4RJ	10 units
9			3SB29 01-4RK	10 units
Graphic ON/OFF symbols				
 O (Off)		5008 IEC	3SB29 01-4MB	10 units
I (On)		5007 IEC	3SB29 01-4MC	10 units
II (On)		--	3SB29 01-4MD	10 units

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Insert labels and insert caps

Inscription/Symbol	Symbol No.	DT	Insert labels For push buttons and illuminated push buttons, flat Order No.	PS
Graphic equipment symbols				
 Electric motor	 0011 ISO		3SB29 01-4PA	10 units
Horn	 5014 IEC		3SB29 01-4PB	10 units
Pump	 0134 ISO		3SB29 01-4PD	10 units
Coolant pump	 0355 ISO		3SB29 01-4PE	10 units
Graphic motion symbols				
 Motion in direction of arrow (straight)	 5022 IEC		3SB29 01-4NA	10 units
Motion in direction of arrow (diagonal)	 --		3SB29 01-4NB	10 units
Clockwise rotation	 0004 ISO		3SB29 01-4NC	10 units
Anticlockwise rotation	 --		3SB29 01-4ND	10 units
Fast motion	 0266 ISO		3SB29 01-4NE	10 units
Increase (plus)	 5005 IEC		3SB29 01-4NG	10 units
Decrease (minus)	 5006 IEC		3SB29 01-4MC	10 units
Graphic control symbols				
 Clamp	 --		3SB29 01-4QB	10 units
Release	 --		3SB29 01-4QC	10 units
Brake off	 0021 ISO		3SB29 01-4QE	10 units
Lock	 0022 ISO		3SB29 01-4QF	10 units
Unlock	 0023 ISO		3SB29 01-4QG	10 units
On/Off, momentary contact	 5011 IEC		3SB29 01-4QJ	10 units
Manual operation	 0096 ISO		3SB29 01-4QK	10 units
Automatic sequence	 0017 ISO		3SB29 01-4QL	10 units
Customized inscriptions				
 Any inscription 1 line of text with up to 6 characters of 3 mm in height. Please add the appropriate order code to the Order No. and specify the line of text required.			3SB29 01-4AZ K0Y K1Y or K2Y K5Y	1 unit 1 unit 1 unit
 Other graphic symbols Please add the order code "K3Y" to the Order No. and specify the serial number and the applied standard (ISO 7000 or IEC 60417).			3SB29 01-4AZ K3Y	1 unit
 Any inscription or symbol Please add the order code "K9Y" to the Order No. and specify the inscription or the symbol required.			3SB29 01-4AZ K9Y	1 unit

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Insert labels and insert caps

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Inscription/Symbol	Symbol No.	DT	Insert caps For push buttons and illuminated push buttons, raised Order No.	PS
--------------------	------------	----	---	----





For self-inscription

	Blank		3SB29 01-5AA	10 units
---	-------	--	---------------------	----------






With inscription

	On		3SB29 01-5EB	10 units
	0		3SB29 01-5RA	10 units
	1		3SB29 01-5RB	10 units
	2		3SB29 01-5RC	10 units
	3		3SB29 01-5RD	10 units
	4		3SB29 01-5RE	10 units
	5		3SB29 01-5RF	10 units
	6		3SB29 01-5RG	10 units
	7		3SB29 01-5RH	10 units
	8		3SB29 01-5RJ	10 units
	9		3SB29 01-5RK	10 units

Graphic ON/OFF symbols

	O (Off)		5008 IEC	3SB29 01-5MB	10 units
	I (On)		5007 IEC	3SB29 01-5MC	10 units
	II (On)		--	3SB29 01-5MD	10 units


Graphic motion symbols

	Motion in direction of arrow		5022 IEC	3SB29 01-5NA	10 units
	Motion in direction of arrow		--	3SB29 01-5NB	10 units
	Increase (plus)		5005 IEC	3SB29 01-5NG	10 units
	Decrease (minus)		5006 IEC	3SB29 01-5MC	10 units

Graphic control symbols

	Clamp		--	3SB29 01-5QB	10 units
	Release		--	3SB29 01-5QC	10 units







Customized inscriptions

	Any inscription 1 line of text with up to 6 characters of 3 mm in height. Please add the appropriate order code to the Order No. and specify the line of text required.		3SB29 01-5AZ K0Y K1Y or K2Y K5Y	1 unit 1 unit 1 unit
	Other graphic symbols Please add the order code "K3Y" to the Order No. and specify the serial number and the applied standard (ISO 7000 or IEC 60417).		3SB29 01-5AZ K3Y	1 unit
	Any inscription or symbol Please add the order code "K9Y" to the Order No. and specify the inscription or the symbol required.		3SB29 01-5AZ K9Y	1 unit

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Insert labels and insert caps

Inscription/Symbol	Symbol No.	DT	Insert caps For indicator lights Order No.	PS
For self-inscription				
 Blank			3SB29 01-7AA	10 units
Graphic symbols				
 Pump		 0134 ISO	3SB29 01-7PD	10 units
 Manual operation		 0096 ISO	3SB29 01-7QK	10 units
Customized inscriptions				
	Any inscription 1 line of text with up to 6 characters of 3 mm in height. Please add the appropriate order code to the Order No. and specify the line of text required.		3SB29 01-7AZ K0Y K1Y or K2Y K5Y	1 unit 1 unit 1 unit
	Other graphic symbols Please add the order code " K3Y " to the Order No. and specify the serial number and the applied standard (ISO 7000 or IEC 60417).		3SB29 01-7AZ K3Y	1 unit
	Any inscription or symbol Please add the order code " K9Y " to the Order No. and specify the inscription or the symbol required.		3SB29 01-7AZ K9Y	1 unit

Options

Customized inscriptions

Labels and caps can be inscribed with text and symbols not listed in the ordering data. Append the following codes to the Order No.:

- Text line in upper/lower case, always upper case for beginning of line (e.g. "Lift"): **K0Y**
- Text line in upper case (e.g. "LIFT"): **K1Y**
- Text line in lower case (e.g. "lift"): **K2Y**
- Text line in upper/lower case, all words begin with upper case letters (e.g. "Lift"): **K5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **K3Y**
- Any inscription or symbols according to order form supplement: **K9Y**

When ordering, specify the required inscription in plain text in addition to the order number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language.

One line with up to 6 characters with 3 mm letter height is possible for the inscription ([see ordering example 1](#)).

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417 ([see ordering examples 2 and 3](#)).

For special symbols (order code K9Y), a CAD drawing in DXF format can be submitted.

Ordering example 1

3SB29 01-4AZ
K1Y
Z = pump

Ordering example 2

3SB29 01-4AZ
K3Y
Z = 5008 IEC

Ordering example 3

3SB29 01-4AZ
K9Y
Z = 1118 ISO

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Name plates

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Overview






The name plates consist of a black plastic label holder and an inscription label (silver with black print) for sticking in place.

Note mounting dimensions!

Inscriptions

The inscriptions (also special inscriptions) are lower case with upper case initial letters. Graphic symbols, including those not listed in the catalog, are according to ISO 7000 or IEC 60417.

Selection and ordering data

Inscription/Symbol	Symbol No.	DT	Order No.	PS
Inscription labels, self-adhesive, 9.5 mm x 18.5 mm				
 Blank			3SB29 01-2AA	10 units
On			3SB29 01-2EB	10 units
Off			3SB29 01-2EC	10 units
Start			3SB29 01-2EL	10 units
Reset			3SB29 01-2EM	10 units
Fault			3SB29 01-2EW	10 units
Hand Auto			3SB29 01-2BA	10 units
Manual 0 Auto			3SB29 01-2BE	10 units
Man 0 Auto			3SB29 01-2ET	10 units
Graphic symbols				
O (Off)		5008 IEC	3SB29 01-2MB	1 unit
I (On)		5007 IEC	3SB29 01-2MC	1 unit
O I (horizontal)		--	3SB29 01-2MF	1 unit
Motion in direction of arrow		5002 IEC	3SB29 01-2NA	1 unit
Customized inscriptions or symbols				
(see Options)			3SB29 01-2XZ	
			K0Y	1 unit
			K1Y, K2Y or K3Y	1 unit
			K5Y	1 unit
			K9Y	1 unit
Label holders				
	Label holders for inscription labels		3SB29 02-0AB	1 unit
	The label holders must not be used with the 3SB2...-1AC01 EMERGENCY-STOP mushroom push button.			

Options

Customized inscriptions

The labels can be inscribed with text and symbols not listed in the ordering data. Append the following codes to the Order No.:

- Text line(s) in upper/lower case, upper case always for beginning of line (e.g. "Lift off"): **K0Y**
- Text line(s) in upper case (e.g. "LIFT OFF"): **K1Y**
- Text line(s) in lower case (e.g. "lift off"): **K2Y**
- Text line(s) in upper/lower case, all words begin with upper case letters (e.g. "Lift Off"): **K5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **K3Y**
- Any inscription or symbols according to order form supplement: **K9Y**

When ordering, specify the required inscription in plain text in addition to the order number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language.

Two lines of 11 characters are permitted with 4 mm letter height (1 line) or 3 mm (2-line).

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417 (see ordering example).

For special symbols (order code K9Y), a CAD drawing in DXF format can be submitted.

Ordering example












3SB29 01-2XZ
K3Y
Z = 1118 ISO

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Mounting parts and components

Selection and ordering data

Version	Lamp voltage	Color	DT	Order No.	PS
V					
Buttons and lenses ¹⁾					
	Buttons, flat For push buttons	Black		3SB29 10-0AB	1 unit
		Red		3SB29 10-0AC	1 unit
		Yellow		3SB29 10-0AD	1 unit
		Green		3SB29 10-0AE	1 unit
		Blue		3SB29 10-0AF	1 unit
		White		3SB29 10-0AG	1 unit
		Clear		3SB29 10-0AH	1 unit
	Buttons, flat For illuminated push buttons	Red		3SB29 10-0CC	1 unit
		Yellow		3SB29 10-0CD	1 unit
		Green		3SB29 10-0CE	1 unit
		Blue		3SB29 10-0CF	1 unit
		White		3SB29 10-0AG	1 unit
		Clear		3SB29 10-0AH	1 unit
	Buttons, raised For push buttons	Black		3SB29 10-0BB	1 unit
		Red		3SB29 10-0BC	1 unit
		Yellow		3SB29 10-0BD	1 unit
		Clear		3SB29 10-0BH	1 unit
	Buttons, raised For illuminated push buttons	Red		3SB29 10-0DC	1 unit
		Yellow		3SB29 10-0DD	1 unit
		Clear		3SB29 10-0BH	1 unit
	Screw lenses With concentric rings	Red		3SB29 10-1AC	1 unit
		Yellow		3SB29 10-1AD	1 unit
		Green		3SB29 10-1AE	1 unit
		Blue		3SB29 10-1AF	1 unit
		White		3SB29 10-1AG	1 unit
		Clear		3SB29 10-1AH	1 unit
	Screw lenses Smooth, for inscription with insert cap	Red		3SB29 10-1BC	1 unit
		Yellow		3SB29 10-1BD	1 unit
		Green		3SB29 10-1BE	1 unit
		Blue		3SB29 10-1BF	1 unit
		Clear		3SB29 10-1BH	1 unit
Key for actuators					
	Keys For CES key-operated switch, lock No. SB2			3SB29 08-2AJ	1 unit
3SB29 08-2AJ					
Lamps, wedge bases ²⁾					
	Incandescent lamps Wedge base W2 × 4.6 d, 1.0 W	AC/DC	Clear		
		6		3SB29 08-1AA	1 unit
		12		3SB29 08-1AB	1 unit
		24		3SB29 08-1AC	1 unit
		30		3SB29 08-1AD	1 unit
		48		3SB29 08-1AE	1 unit
		60		3SB29 08-1AF	1 unit
	LED lamps, super-bright Wedge base W2 × 4.6 d	24 AC/DC	Red	3SB39 01-1SB	1 unit
			Yellow	3SB39 01-1RB	1 unit
			Green	3SB39 01-1TB	1 unit
			White	3SB39 01-1UB	1 unit
			Blue	3SB29 08-1BD	1 unit
		28 AC/DC	Red	3SB39 01-1SE	1 unit
			Yellow	3SB39 01-1RE	1 unit
			Green	3SB39 01-1TE	1 unit
			White	3SB39 01-1UE	1 unit
			Blue	3SB39 01-1VE	1 unit
	Lamp extractors For lamps with bases W2 × 4.6 d			3SB29 08-2AB	1 unit
3SB29 08-1AB					

¹⁾ Included in the scope of supply of actuators or indicator lights.

²⁾ Included in the scope of supply of some complete units.

Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Mounting parts and components

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Version	DT	Order No.	PS
Accessories for command points			
	Single frames for square design ¹⁾	3SB29 02-0AA	1 unit
	Name plates, yellow, Ø 50 mm As backing plate for EMERGENCY-STOP, self-adhesive • Blank • With German inscription "NOT-HALT" • With German inscription "NOT-AUS"	3SB29 08-2AF 3SB29 08-2AG 3SB29 08-2AK	1 unit 1 unit 1 unit
	Blanking plugs Black plastic (degree of protection IP65)	3SB29 08-3AA	1 unit
	Protective caps, clear Silicone, for push buttons with flat and raised button	3SB29 08-3AB	1 unit
Flat connectors			
	Plug-in sleeves For flat connectors 2.8 × 0.8 mm, cross-section 0.5 ... 1.5 mm ²	3SB29 08-8AA	1 unit
	Insulation sleeves For flat connectors, connection from the front	3SB29 08-8AB	1 unit
	Complete connectors²⁾ For connecting contact blocks and lamp holders (up to 10 connections). Guaranteed finger-safe acc. to IEC 61140 and BGV A3.	3SB29 08-8AD	1 unit
	Plug-in sleeves For flat connectors 2.8 × 0.8 mm, with locating spring for maintained in complete connector	3SB29 08-8AE	250 units
Tools			
	Dismantling tools For holders and lamp holders with holder	3SB29 08-2AA	1 unit
	Mounting tools For buttons and screw lenses	3SB29 08-2AC	1 unit

¹⁾ Not suitable for EMERGENCY-STOP mushroom push buttons.

²⁾ Required 3SB29 08-8AE plug-in sleeves for flat connectors 2.8 × 0.8 mm are not included in the scope of supply.

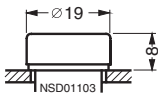
Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

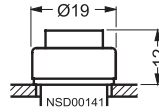
Dimension drawings (mm)

Actuators

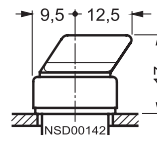
Pushbutton or illuminated pushbutton
with flat button



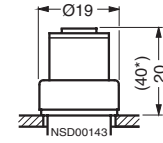
Pushbutton or illuminated pushbutton
with raised button



Selector switch

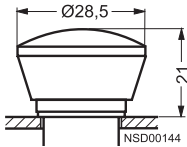


CES key-operated switch

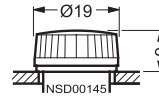


* with key

EMERGENCY-STOP mushroom pushbutton

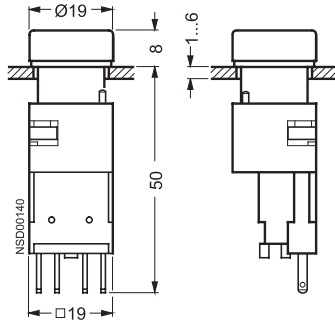


Indicator light



Contact blocks with push-on connection

Pushbutton and contact block
with holder for frontplate mounting



Push Button Units and Indicator Lights

3SB2, Mounting Diameter 16 mm

Dimension drawings (mm)

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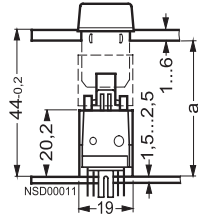
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Contact blocks with soldering pins for use on printed circuit boards

Illuminated pushbutton unit
with contact block and lamp-
holder with solder pins



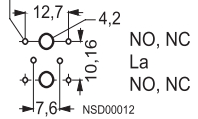
Length **a** of spacers: $a = 44^{-0.2}$
minus front plate thickness.
When using backing plates, the length **a** is
reduced by 0.8 mm.
To avoid bending of the PCB when the actuator is
operated, sufficient spacers must be provided
spaced as shown in the table below:

Maximum PCB thickness	Max. distance between spacers
1.5 mm	80 mm
2.5 mm	150 mm
When using EMERGENCY-STOP actuators	generally 50 mm

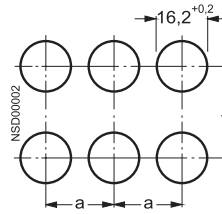
(These details are based on epoxy resin glass fibre mat.)

Solder pin spacing

Solder terminal $\varnothing 1.3^{+0.1}$



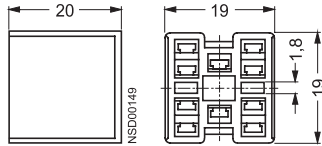
Mounting dimensions



Minimum clearance	a	b
Round design	19	19
Square design without inscription plate	21	21
Round and square designs with 21 inscription plates		32
For 2 selector switches and 3 switching positions, maintained contact, side by side	21	21

Accessories

Complete connector

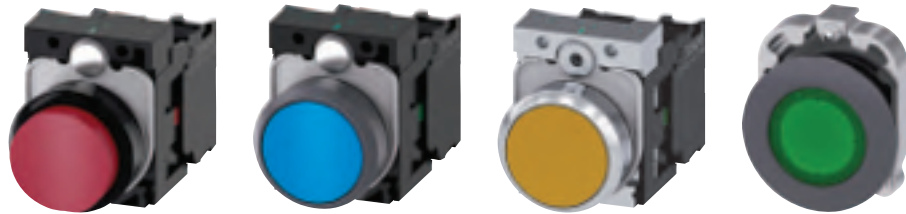


Push Button Units and Indicator Lights

SIRUS ACT 3SU Series

• Revised •
08/31/15

Overview



	3SU1.0	3SU1.3	3SU1.5	3SU1.6
Pushbuttons and indicator lights				
Designs				
Nominal diameter	22 mm	22 mm	22 mm	30 mm
Version	Plastic	Plastic with metal front ring, matte	Metal, shiny	Metal, matte, flat
Actuators				
Pushbuttons	✓	✓	✓	✓
Illuminated pushbuttons	✓	✓	✓	✓
Mushroom pushbuttons	✓	✓	✓	--
EMERGENCY STOP mushroom pushbuttons	✓	✓	✓	--
Selector switches	✓	✓	✓	✓
Key-operated switches	✓	✓	✓	✓
Special actuators				
Twin pushbuttons	✓	✓	✓	--
Coordinate switches	✓	✓	✓	--
Toggle switches	✓	✓	✓	--
Sensor switches	✓	✓	--	--
ID key-operated switches	✓	✓	--	--
Pushbuttons with extended stroke	✓	✓	✓	--
Potentiometers	✓	✓	✓	--
Indicators				
Indicator lights	✓	✓	✓	✓
Acoustic signaling devices	✓	✓	✓	--
Contact modules				
Single-pole	✓	✓	✓	✓
Two-pole	✓	✓	✓	✓
LED modules				
With integrated LED	✓	✓	✓	✓
Connections				
Screw terminals	✓	✓	✓	✓
Spring-type terminals	✓	✓	✓	✓
Solder pins	✓	✓	✓	✓
AS-Interface	✓	✓	✓	✓
IO-Link	✓	✓	✓	✓

✓ Standard

-- Not available

Note:

Safety characteristics (see Appendix on page 10/147).



	3SU18	3SU18
	Enclosures	Two-hand operation consoles
Enclosures		
Plastic	✓	✓
Metal	✓	✓
Actuators		
Pushbuttons	✓	✓
Illuminated pushbuttons	✓	✓
Mushroom pushbuttons	✓	✓
EMERGENCY STOP mushroom pushbuttons	✓	✓
Selector switches	✓	✓
Key-operated switches	✓	✓
Indicators		
Indicator lights	✓	□
Acoustic signaling devices	✓	□
Contact modules		
Single-pole	✓	✓
Two-pole	--	✓
Connections		
Screw terminals	✓	✓
Spring-type terminals	✓	□
Plug-in connection	□	□
AS-Interface	✓	□

- ✓ Standard
-- Not available
□ Optional

AS-Interface solutions

Pushbuttons and indicator lights of the SIRIUS ACT series can be connected to the AS-Interface communication system quickly and easily with the help of various solutions.

For AS-Interface solutions [see catalog IK PI "Industrial Communication SIMATIC NET"](#).

AS-Interface EMERGENCY STOP according to ISO 13850

Using special modules, EMERGENCY STOP devices according to ISO 13850 can be directly connected through the standard AS-Interface with safety-related communication ([see page 10/108](#)).

AS-Interface enclosures

Enclosures with standard fittings are listed in this catalog. For customized enclosures, use the SIRIUS ACT Configurator to select the elements for equipping ([see page 10/116](#)).

PROFINET solutions

SIRIUS ACT devices will be equipped in future with a direct communication interface to PROFINET and PROFIsafe.

RFID authentication solutions

Groups of employees or individuals can be authenticated by means of the ID key-operated switch. Color-coded keys for easy distinction between users and flexible in application thanks to four function stages.

General data

Overview



SIRIUS ACT pushbuttons and indicator lights

SIRIUS ACT – commanding and signaling

SIRIUS ACT is a modular system of pushbuttons and indicator lights for front plate mounting and rear-mounted electrical modules.

Extensive portfolio

- Customized variants, e.g. special tumbler arrangements, labeling, equipped enclosures
- Communication-enabled thanks to direct interfacing to AS-Interface, IO-Link or PROFINET

Diverse possible applications

- National and international approvals
- Many trade approvals
- Short delivery times thanks to global availability

Standards

- IEC 60947-1, EN 60947-1
- IEC 60947-5-1, EN 60947-5-1
- IEC 60947-5-5, EN 60947-5-5 for EMERGENCY STOP devices

Further information

Home page, see www.siemens.com/sirius-act

Industry Mall, see www.siemens.com/product?3SU1

Configurator, see www.siemens.com/sirius-act/configurator

Conversion tool, see www.siemens.com/sirius/conversion-tool

Manual, see <https://support.industry.siemens.com/cs/ww/en/view/107542462>

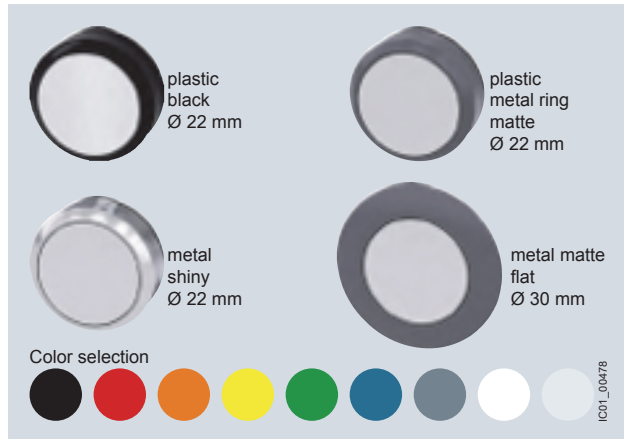
Configurator



- Fast, simple selection by intuitive navigation through clearly-organized menus using drag & drop
- Image preview of selected components
- Inscription of pushbuttons and labeling plates using the interactive inscription tool
- Once created, a configuration can be ordered as often as required using the customer-specific article number and the CIN (Configuration Identification Number)
- Everything at a glance: Product data sheets, certificates, dimensional drawings, list prices, inscription tool

Benefits

Design



SIRIUS ACT is available in four design lines.

Ruggedness



- Degree of protection IP66, IP67, IP69 (IP69K)

IP66	
6 = Protection against the ingress of dust	6 = Protection against powerful splash-water
IP67	
6 = Protection against the ingress of dust	7 = Protection against temporary immersion
IP69 (IP69K)	
6 = Protection against the ingress of dust	9/9K = Protection against water in high-pressure cleaning (approx. 80 bar) and high water jet temperatures (approx. 80 °C)

- Service life of 100 000 hours thanks to use of LEDs
- Media resistance (chemicals) thanks to solid stainless steel and high-grade plastics
- Mechanical endurance of 10×10^6 switching cycles
- Suitable for use in extreme environments
- Reliable, friction-locked fixing with just one screw
- Design stability according to use
- Simple geometry for mounting holes

Communication



- Direct connection of the enclosure to AS-Interface or IO-Link
- Direct connection in the control cabinet to PROFINET, IO-Link or AS-Interface
- Can be integrated easily via the TIA Portal

Easy handling



- Self-holding function of the actuator when mounting
- Twist prevention integrated into patented holder design
- Stackable contact modules
- Self-explanatory and fast installation using one hand
- Components can be mounted with holder removed
- No special tools required, simple size 2 screwdriver (cross-tip DIN ISO 87641PZD1, flat-head DIN ISO 2380-1 A/B 1x4.5) is sufficient

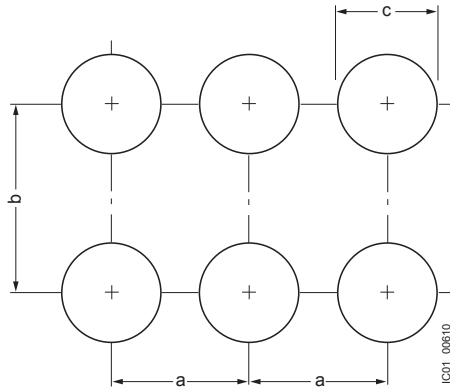
Push Button Units and Indicator Lights

SIRIUS ACT 3SU Series

• Revised •
07/15/16

General data

Mounting dimensions



Versions

SIRIUS ACT is a modular system of pushbuttons and indicator lights with which customized variants can be configured flexibly.

One command point comprises:

- An actuating or signaling element in front of the control panel
- A holder for securing behind the control panel
- Up to six contact modules and/or one LED module (mounted onto the holder), single-pole contacts can be stacked
- A comprehensive range of accessories for inscription/markings

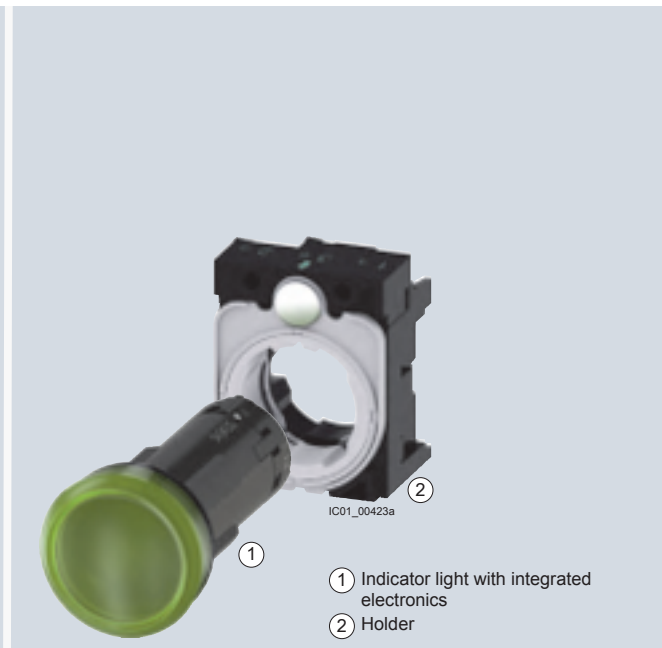
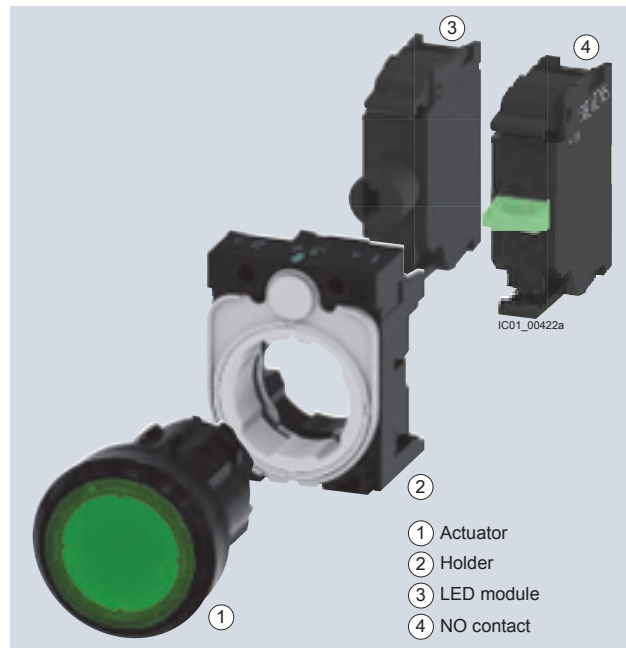
Complete units

Complete units made up of an actuating or signaling element, holder and contact modules and/or LED modules are offered for the most frequent application cases. The electrical parts are integrated and only have to be wired.

	Minimum clearance		
	a	b	c
	mm	mm	mm
22 mm, plastic with metal front ring, matte			
3-slot holder	30	40	22.3 ^{+0.4}
4-slot holder	40	40	22.3 ^{+0.4}
30 mm, metal, matte			
3-slot holder	40	45	30.5 ^{+0.5}

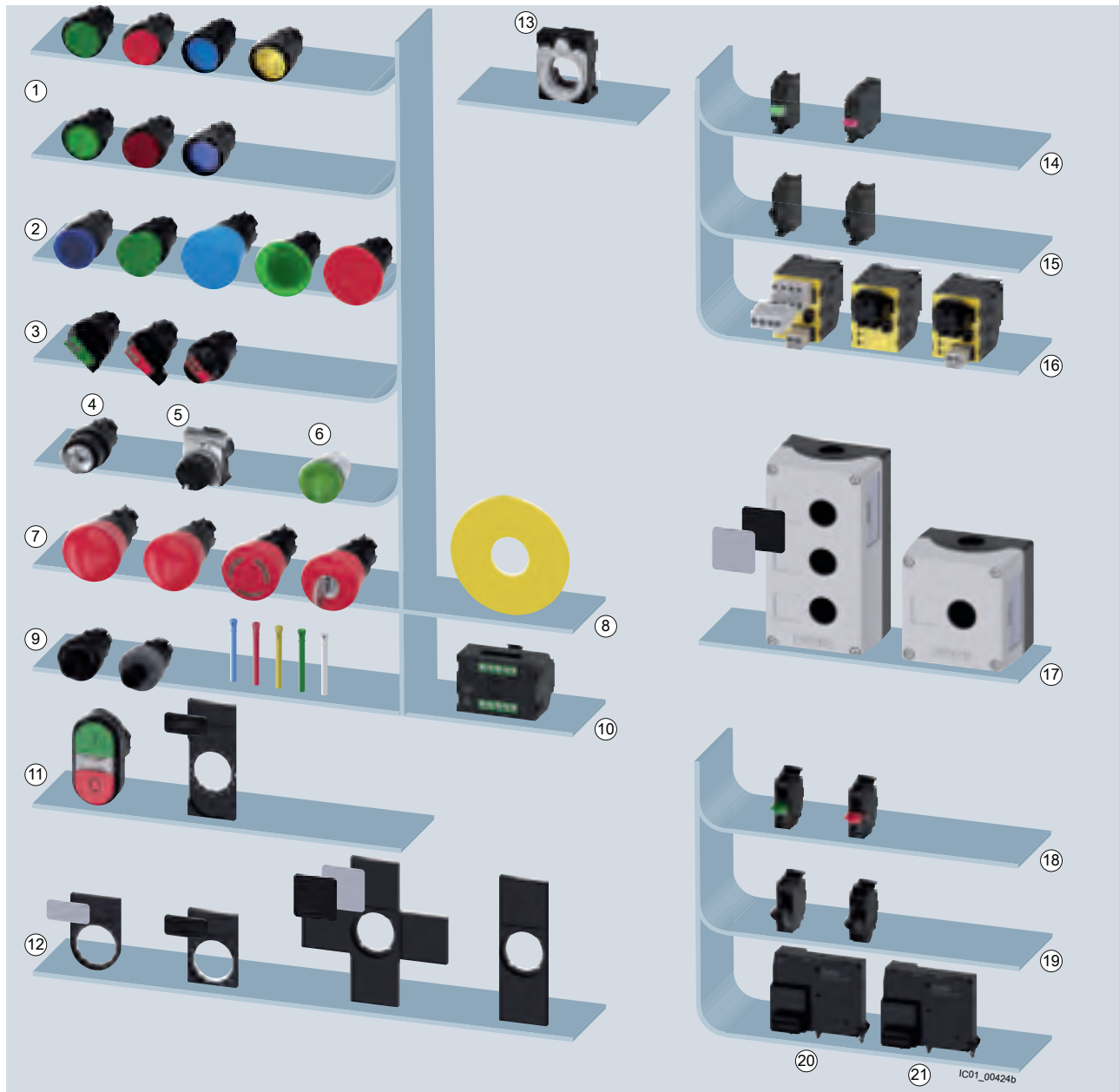
Compact units

Signaling devices, sensor switches, and pushbuttons with extended stroke are available as compact units. The electronic circuitry is already integrated in these devices, i.e. it is not necessary to snap on a contact or LED module.



Complete units	Pages	Compact units	Pages
Plastic, black	10/37	Plastic, black	10/43
Plastic with metal front ring, matte	10/57	Plastic with metal front ring, matte	10/63
Metal, shiny	10/77	Metal, shiny	10/83

Actuating and signaling elements



Actuating and signaling elements		Pages	Modules for front plate mounting		Pages
①	Pushbuttons, illuminated pushbuttons	10/37	⑭	Contact modules	10/104
②	Mushroom pushbuttons	10/39	⑮	LED modules	10/106
③	Selector switches	10/40	⑯	AS-Interface modules	10/108
④⑤⑥	Key-operated switches, potentiometers, indicator lights	10/41	Enclosures		Pages
⑦⑧	EMERGENCY STOP mushroom pushbuttons, backing plates	10/39	⑰	Enclosures	10/110
⑨⑩	ID key-operated switches, ID keys, electronic modules	10/55	Modules for base mounting		Pages
⑪	Twin pushbuttons, label holders, labeling plates	10/47	⑱	Contact modules	10/118
⑫	Label holders, labeling plates	10/122	⑲	LED modules	10/118
Holders and labels		Pages	⑳	IO-Link modules	10/120
⑬	Holders	10/122	㉑	AS-Interface modules	10/120

System overview of SIRIUS ACT pushbuttons and indicator lights from the plastic design line.
Pushbuttons and indicator lights available in 4 design lines.

General data

ID key-operated switches

The ID key-operated switch is electronic and has 4 switch positions that are selected by keys with different codes. Using the 4 ID keys with different codes, it is possible to select 1 of 4 positions.

The ID keys are color-coded (yellow, blue, red, green, white) so that they can be clearly differentiated at a glance.

Different versions of ID key-operated switches are available depending on the following features:

- Front ring material
- Conventional variant: 1 + 4 non-isolated outputs
- Variant with IO-Link: Option of individual coding

Operation:

Insert ID key, turn key to select the position. Standard keys can also be used in conjunction with the electronic module for ID key-operated switches with IO-Link function. The white ID key is supplied without coding.



3SU1000-4WS10-0AA0
Plastic, black



3SU1030-4WS10-0AA0
Plastic with metal front ring, matte

ID key-operated switches		
Number of switching positions	4	4
Operating angle	45°	45°
Operating principle	Latching	Latching
Switch position for key removal	Key removal possible in all 4 positions	Key removal possible in all 4 positions
Color	Black	Black
Pages	10/55	10/75



3SU1400-1GC10-1AA0



3SU1400-1GD10-1AA0

Electronic modules for ID key-operated switches		
Type of power supply	--	via IO-Link master
Protocol is supported	--	IO-Link protocol
Number of NO contacts	5	5
IO-Link transfer rate	--	COM2 (38.4 Kbaud)
Pages	10/109	10/109



3SU1900-0FU60-0AA0

ID keys ID group individual








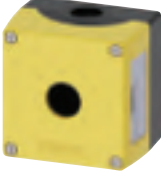

**3SU1900-0FV40-0AA0
3SU1900-0FW30-0AA0
3SU1900-0FX20-0AA0
3SU1900-0FY50-0AA0**

ID keys

ID keys		
Material	Plastic	Plastic
Version of RFID coding	Individually coded, programmable several times	ID group 1 ID group 2 ID group 3 ID group 4
Color	White	Green Yellow Red Blue
Pages	10/143	10/143

Article No. scheme

Device types

						
3SU10	3SU11	3SU12	3SU14	3SU15	3SU18	3SU19
Device types						
Actuating and signaling elements	Complete units	Compact units	Modules for actuators and indicators	Holders with module	Enclosures	Accessories

Actuating and signaling elements

Product versions		Article number															
SIRIUS ACT pushbuttons and indicator lights		3SU1				-								-			
Device type	Actuating and signaling elements	0															
Material (front ring)	Plastic, black	0															
	Metal, matte (front ring)/ plastic, black (rosette)	3															
	Metal, shiny	5															
	Metal, matte	6															
Illumination	Non-illuminated	0															
	Illuminated/transparent	1															
	Illuminated/non illuminated	2															
Type of actuator/indicator	Pushbutton	0															
	Mushroom pushbutton/ EMERGENCY STOP mushroom	1															
	pushbutton/sensor switch	2															
	Selector switch	3															
	Twin pushbutton, toggle switch	4/5															
	Key-operated switch	6															
	Indicator light/acoustic signaling device Coordinate switch	7															
Design of the actuator/ acoustic signaling device	e.g. A = Flat																
Function	e.g. B = Momentary contact																
Color/key removal position	e.g. 10 = Black, 20 = Red																
Connection type	0 = None																
Module/holder equipment	e.g. A = without module, without holder Y = without module, with holder																
Marking	e.g. A = None, C = "I", D = "O", R = "R"																
Ambient condition	Standard, ATEX																
Example		3SU1	0	0	0	-	0	A	B	1	0	-	0	A	A	0	

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.

Push Button Units and Indicator Lights

SIRIUS ACT 3SU Series

• Revised •

07/15/16

General data

Complete units

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		3SU1				-							-			
Device type	Complete units	1														
Material (front ring)	Plastic, black	0														
	Metal, matte (front ring)/ plastic, black (rosette)	3														
	Metal, shiny	5														
	Metal, matte	6														
Illumination	Non-illuminated	0														
	Illuminated (with/without LED, various voltages)	1...8														
Type of actuator/indicator	Pushbutton	0														
	Mushroom pushbutton/EMERGENCY	1														
	STOP mushroom pushbutton/ sensor switch	2														
	Selector switch	3														
	Twin pushbutton, toggle switch	4/5														
	Key-operated switch	6														
	Indicator light/acoustic signaling device	7														
	Coordinate switch															
Design of the actuator/acoustic signaling device	e.g. A = Flat															
Function	e.g. B = Momentary contact															
Color/key removal position	e. g. 10 = Black, 20 = Red															
Connection type	Screw terminals Spring-type terminals															
Module/holder equipment incl. contact material	e. g.															
	A = Without module, with holder															
	B = 1 NO contact with holder															
	C = 1 NC contact with holder															
Marking	e.g. A = None, C = "I", D = "O", R = "R"															
Ambient condition	Standard ATEX															
Example		3SU1	1	0	0	-	0	A	A	1	0	-	1	B	A	0

Compact units

Product versions		Article number														
SIRIUS ACT pushbuttons and indicator lights		3SU1				-							-			
Device type	Compact units	2														
Material (front ring)	Plastic, black	0														
	Metal, matte (front ring)/ plastic, black (rosette)	3														
	Metal, shiny	5														
	Metal, matte	6														
Illumination	Non-illuminated	0														
	Illuminated/non illuminated	1														
Type of actuator/indicator	Pushbutton	0														
	Sensor switch	1														
	Potentiometer	2														
	Indicator light/acoustic signaling device	6														
Design of the actuator/acoustic signaling device	e.g. A = Flat															
Function (voltage/resistance)	e.g. B = 24 V AC/DC															
Color	e. g. 10 = Black, 20 = Red															
Connection type	None															
	Screw terminals															
	M12 connection, 4-pole															
	Spring-type terminals															
Module/holder equipment incl. contact material	e. g.															
	A = Without module, without holder															
	B = 1 NO contact with holder															
	C = 1 NC contact with holder															
Marking	e.g. A = none															
Ambient condition	Standard ATEX															
Example		3SU1	2	0	1	-	6	A	B	0	0	-	1	A	A	0

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.

Modules for actuators and indicators

Product versions		Article number															
SIRIUS ACT pushbuttons and indicator lights		3SU1				-							-				
Device type	Modules for actuators and indicators	4															
Material (front ring)	Plastic, black	0															
Illumination	Non-illuminated Illuminated	0 1															
Type of mounting	Front plate mounting Base mounting Printed circuit board						1 2 3										
Module type	Contact module LED module LED test module Support terminal AS-Interface module Electronic module for ID key-operated switches							A B C D E G									
Function/voltage	e.g. B = 24 V AC/DC																
Color	e. g. 10 = Black, 20 = Red																
Connection type	Screw terminals Screw terminals + insulation piercing method Spring-type terminals Spring-type terminals + insulation piercing method Socket terminals														1 2 3 4 5		
Module equipment incl. contact material	e. g. A = None B = 1 NO contact, silver C = 1 NC contact, silver																
Marking	None																A
Ambient condition	Standard ATEX																0 1
Example		3SU1	4	0	0	-	1	A	A	1	0	-	1	B	A	0	

Holders

Product versions		Article number															
SIRIUS ACT pushbuttons and indicator lights		3SU1				-							-				
Device type	Holder	5															
Material (front ring)	Plastic, black Metal, shiny	0 5															
Illumination	Non-illuminated Illuminated	0 1															
Type of mounting	None Front plate mounting						0 1										
Holder type	3x A 4x B							A B									
Function/voltage	None 6 ... 24 V AC/DC								A G								
Color	e.g. 10 = Black, 20 = Red																
Connection type	None Screw terminals														0 1		
Module equipment incl. contact material and slot	e. g. A = None B = 1 NO contact, silver C = 1 NC contact, silver																
Marking	None																A
Ambient condition	Standard ATEX																0 1
Example		3SU1	5	0	0	-	0	A	A	1	0	-	0	A	A	0	

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.

Push Button Units and Indicator Lights

SIRIUS ACT 3SU Series

• Revised •

07/15/16

General Data

Enclosures

Product versions		Article number															
SIRIUS ACT pushbuttons and indicator lights		3SU1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Device type	8 = Enclosure	8															
Material (enclosure/front ring)	Plastic / black plastic	0															
	Metal, shiny metal	5															
Number of command points	1 command point	1															
															
	6 command points	6															
Type of enclosure	Configuration	0															
	4-position selector switches	1															
	and coordinate switches	2															
	Palm pushbutton	3															
Equipment	Two-hand operation console																
	e.g. command point, inscription, module		<input type="checkbox"/>	<input type="checkbox"/>													
Communication capability	None									0							
	AS-i									1							
Ambient condition	Standard									0							
	ATEX									1							
Mounting/ connection of modules	None													0			
	Front plate mounting, screw terminals													1			
	Base mounting, screw terminals													2			
	Base mounting, spring-type terminals													3			
Cable exit from enclosure	None															A	
	Direct entry of AS-i flat cable at top/on right															G	
	AS-i insulation piercing method at top/ on right															H	
Design of enclosure top	Center command point															A	
	With recess for labeling plate															B	
	With protective collar																
	4 additional holes (two-hand operation console)															C	
	8 additional premachined breaking points (two-hand operation console)															D	
Color of enclosure top	Gray																8
	Yellow																
Example		3SU1	8	0	1	-	0	A	A	0	0	-	0	A	A	2	

Accessories

Product versions		Article number															
SIRIUS ACT Pushbuttons and Indicator Lights		3SU1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Device type	Accessories	9															
Material	Plastic, black	0															
	Metal/plastic	3															
	Metal, shiny	5															
	Metal, matte	6															
Illumination	Non-illuminated	0															
	Illuminated	1															
Type of accessory (labels, protection, actuator, enclosure)	e. g.						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
	OAB = Insert label																
Color	e. g. 10 = Black, 20 = Red									<input type="checkbox"/>	<input type="checkbox"/>						
Marking	e. g.													<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	OAA = None																
	OAB = ON																
	OAT = EMERGENCY STOP																
Ambient condition	Standard																0
	ATEX																1
Example		3SU1	9	0	0		0	A	B	7	1		0	A	B	0	

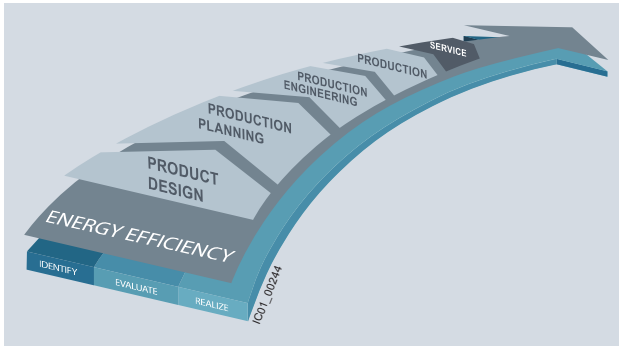
Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.

Benefits

Advantages through energy efficiency



Energy management in industry

Overview of the energy management process

We offer you a unique portfolio for efficient energy management in the industry – a process that is used to optimize the energy requirements. We divide operational energy management into the three phases: identification, evaluation and implementation, and support you with suitable hardware and software solutions in each phase of the process.

The innovative products of the SIRIUS industrial controls portfolio can also make a substantial contribution to a plant's energy efficiency (see www.siemens.com/sirius/energysaving).

SIRIUS ACT pushbuttons and indicator lights contribute to energy efficiency throughout the plant as follows:

- Lower power consumption by means of LED technology
- Long service life

Application

Environmental conditions

The pushbuttons and indicator lights are climate-proof (KTW 24) and suitable for standard industrial applications and operation in marine applications.

Safety EMERGENCY STOP pushbuttons according to ISO 13850

For controls according to IEC 60204-1 or EN 60204-1, the SIRIUS ACT mushroom pushbuttons are suitable for use as safety EMERGENCY STOP pushbuttons.

Safety circuits

IEC 60947-5-1 and EN 60947-5-1 require positive opening. This means that for the purpose of personal safety, the reliable opening of NC contacts in all safety circuits is expressly prescribed for the electrical equipment of machines and is designated according to IEC 60947-5-1 with the symbol (⊖).

Category 4 according to EN ISO 13849-1 can be attained with the EMERGENCY STOP mushroom pushbuttons if the corresponding fail-safe evaluation units are selected and correctly installed, e.g. the 3SK11 safety relays or the 3RK3 Modular Safety System (see page 11/1 onwards) or matching units from the ASIsafe, SIMATIC or SINUMERIK product ranges.

The SIRIUS ACT pushbuttons and indicator lights can be connected to the AS-Interface communication system quickly and safely.

The following solutions are available:

- AS-Interface modules
- AS-Interface module in safety-related version for EMERGENCY STOP mushroom pushbutton
- Ready-fitted AS-Interface enclosures with 1 to 6 command points

IO-Link

The SIRIUS ACT pushbuttons and indicator lights can be connected to IO-Link quickly and safely. The connection is made via a special IO-Link-module.

Push Button Units and Indicator Lights

SIRUS ACT 3SU Series

• Revised •
07/15/16

General Data

Technical specifications

Type	3SU1..0-AA 3SU1..0-JA		3SU1..1-AA 3SU1..1-JA		3SU1..0-AB 3SU1..0-BB 3SU1..0-CB 3SU1..0-DB 3SU1..0-JB		3SU1..1-AB 3SU1..1-BB 3SU1..1-JB	
Product version	Pushbuttons							
Operating principle of the actuating element	Latching				Momentary contact			
Optional expansion of product by light source	No		Yes		No		Yes	
Mechanical endurance (operating cycles) typical	500 000				10 000 000		3 000 000	
Switching frequency maximum	1/h	1 800			3 600			
Shock resistance acc. to IEC 60068-2-27	Half-sine wave 50 g / 11 ms							
Vibration resistance acc. to IEC 60068-2-6	10 ... 500 Hz: 5 g							
IP degree of protection	IP66, IP67, IP69 (IP69K)							
Environmental category during operation according to IEC 60721	3M6, 3S2, 3B2, 3C3, 3K6 (with a relative air humidity of 10 ... 95%)							
Ambient temperature								
• During operation	°C	-25 ... +70						
• During storage	°C	-40 ... +80						

Type	3SU1.00-AA 3SU1.00-BA 3SU1.00-CA 3SU1.30-AA 3SU1.30-BA 3SU1.50-AA 3SU1.50-BA 3SU1.50-CA		3SU1.50-EA		3SU1.01-AA 3SU1.01-BA 3SU1.51-AA 3SU1.51-BA 3SU1.51-CA		3SU1.00-AD 3SU1.00-BD 3SU1.00-CD 3SU1.30-AD 3SU1.30-BD 3SU1.50-AD 3SU1.50-BD 3SU1.50-CD		3SU1.50-ED		3SU1.01-AD 3SU1.01-BD 3SU1.31-AD 3SU1.31-BD	
Product version	Mushroom pushbuttons											
Operating principle of the actuating element	Latching					Momentary contact						
Optional expansion of product by light source	No				Yes		No				Yes	
Mechanical endurance (operating cycles) typical	500 000		300 000		500 000		10 000 000		300 000		3 000 000	
Switching frequency maximum	1/h	1 800					3 600		1 800		3 600	
Shock resistance acc. to IEC 60068-2-27	Half-sine wave 50 g / 11 ms											
Vibration resistance acc. to IEC 60068-2-6	10 ... 500 Hz: 5 g											
IP degree of protection	IP66, IP67, IP69 (IP69K)		IP65, IP67, IP69 (IP69K)		IP66, IP67, IP69 (IP69K)				IP65, IP67, IP69 (IP69K)		IP66, IP67, IP69 (IP69K)	
Environmental category during operation according to IEC 60721	3M6, 3S2, 3B2, 3C3, 3K6 (with a relative air humidity of 10 ... 95%)											
Ambient temperature												
• During operation	°C	-25 ... +70										
• During storage	°C	-40 ... +80										

Type	3SU1...-J 3SU1...-H 3SU1...-G										
Product version	EMERGENCY STOP mushroom pushbuttons										
Mechanical endurance (operating cycles)	300 000										
Switching frequency maximum	1/h	600									
Shock resistance acc. to IEC 60068-2-27	Half-sine wave 50 g / 11 ms										
Vibration resistance acc. to IEC 60068-2-6	10 ... 500 Hz: 5 g										
IP degree of protection	IP66, IP67, IP69 (IP69K)										
Environmental category during operation according to EN 60721	3M6, 3S2, 3B2, 3C3, 3K6 (with a relative air humidity of 10 ... 95%)										
Ambient temperature											
• During operation	°C	-25 ... 70									
• During storage	°C	-40 ... 80									

¹⁾ UL NEMA rating for twin pushbuttons (all types) –
NEMA Type: 1, 2, 3, 3R, 4, 4X

Type		3SU1.5.-2A 3SU1.5.-2B 3SU1.5.-2C 3SU1.5.-2D 3SU1.5.-2E	3SU1.0.-2A 3SU1.0.-2B 3SU1.0.-2C 3SU1.3.-2A 3SU1.3.-2B 3SU1.3.-2C	3SU1.0.-3E 3SU1.3.-3E 3SU1.5.-3E	3SU1.0.-4B 3SU1.0.-4C 3SU1.0.-4D 3SU1.0.-4F 3SU1.0.-4G 3SU1.0.-4H 3SU1.0.-4J 3SU1.0.-4L 3SU1.0.-5B 3SU1.0.-5H 3SU1.0.-5P 3SU1.0.-5Q 3SU1.0.-5R 3SU1.0.-5S 3SU1.0.-5T 3SU1.0.-5X	3SU1...-4B 3SU1...-4C 3SU1...-4D 3SU1...-4F 3SU1...-4G 3SU1...-4H 3SU1...-4J 3SU1...-4L 3SU1...-5B 3SU1...-5H 3SU1...-5K 3SU1...-5L 3SU1...-5P 3SU1...-5Q 3SU1...-5R 3SU1...-5S 3SU1...-5T 3SU1...-5X	3SU1.0.-7A 3SU1.0.-7B 3SU1.3.-7A 3SU1.3.-7B 3SU1.5.-7A 3SU1.5.-7B
Product version		Selector switches		Toggle switches	Key-operated switches		Coordinate switches
Mechanical endurance (operating cycles)		300 000	1 000 000			300 000	250 000
Switching frequency maximum	1/h	1 800	3 600				
Shock resistance acc. to IEC 60068-2-27		Half-sine wave 50 g / 11 ms					
Vibration resistance acc. to IEC 60068-2-6		10 ... 500 Hz: 5 g					
IP degree of protection		IP66, IP67, IP69 (IP69K)		IP66, IP67, IP69K	IP66, IP67, IP69 (IP69K)		IP65, IP67
Ambient temperature							
• During operation	°C	-25 ... +70					
• During storage	°C	-40 ... +80					

Type		3SU1400- .AA101-.A0	3SU1400- 1AA101-GA0, 3SU1400- 1AA101-RA0	3SU1400- 1AA101-HA0	3SU1400- .AA103-.A0	3SU1400- 1AA103-GA0, 3SU1400- 1AA103-RA0	3SU1400- 1AA103-HA0	3SU1400- 3AA105-.A0
Product version		Contact modules						
Rated insulation voltage	V	500						
Pollution degree		3						
Impulse withstand voltage	kV	6						
Rated value								
Operational voltage type		AC/DC						
Operational voltage, rated value								
• At AC at 50 Hz	V	5 ... 500						
• At DC	V	5 ... 500						
Thermal current	A	10						
Operational current, rated value								
• At AC-12								
- At 24 V	A	10						
- At 230 V	A	8						
• At AC-15								
- At 24 V	A	6						
- At 230 V	A	6	4		6	4		6
- At 400 V	A	3						
- At 500 V	A	1.4						
• At DC-12								
- At 24 V	A	10						
- At 48 V	A	5						
- At 110 V	A	2.5						
- At 230 V	A	1		0.3	1		0.3	1
- At 400 V	A	0.3						
- At 500 V	A	0.3						
• At DC-13								
- At 24 V	A	3						
- At 48 V	A	1.5						
- At 110 V	A	0.7						
- At 230 V	A	0.3						
- At 400 V	A	0.1						
- At 500 V	A	0.1						
Contact reliability		One contact failure per 100 million (17 V, 5 mA), one contact failure per 10 million (5 V, 1 mA)						
Mechanical endurance (operating cycles) typical		10 000 000						



Push Button Units and Indicator Lights

SIRUS ACT 3SU Series

• Revised •
07/15/16

General data

Type	3SU1400- .AA101-.A0		3SU1400- 1AA101-GA0, 3SU1400- 1AA101-RA0	3SU1400- 1AA101-HA0	3SU1400- .AA103-.A0	3SU1400- 1AA103-GA0, 3SU1400- 1AA103-RA0	3SU1400- 1AA103-HA0	3SU1400- 3AA105-.A0
Product version	Contact modules							
Switching frequency maximum	1/s	3600						
Fuse link version required for short-circuit protection of the auxiliary switch with type of coordination 1	gG / Dz 10 A, quick-response / Dz 10 A							
Continuous current of miniature circuit breaker C characteristic	A	10						
Vibration resistance acc. to IEC 60068-2-6	10 ... 500 Hz: 5 g							
Shock resistance acc. to IEC 60068-2-27	Half-sine wave 50 g / 11 ms							
Climate class during operation according to EN 60721	3M6, 3S2, 3B2, 3C3, 3K6 (with a relative air humidity of 10 ... 95%, no condensation permitted in operation)							
Ambient temperature								
• During operation	°C	-25 ... +70						
• During storage	°C	-40 ... +80						
IP degree of protection								
• of the enclosure		IP40						
• of the terminal		IP20						
Type of electrical connection		Screw terminals			Spring-type terminals		Socket terminals (THT)	
Type of connectable conductor cross-sections								
• Solid with end sleeve		2 x (0.5 ... 0.75 mm²)			--			
• Solid without end sleeve		2 x (1.0 ... 1.5 mm²)			2 x (0.25 ... 1.5 mm²)		--	
• Finely stranded with end sleeve		2 x (0.5 ... 1.5 mm²)			2 x (0.25 ... 0.75 mm²)		--	
• Finely stranded without end sleeve		2 x (1.0 ... 1.5 mm²)			2 x (0.25 ... 1.5 mm²)		--	
• For AWG cables		2 x (18 ... 14)			2 x (24 ... 16)		--	
Tightening torque for screw terminals	Nm	0.8 ... 0.9			--			

Type		3SU1401-.....-1	3SU1401-.....-3	3SU1401-.....-5
Product version		LED module		
Light source integrated in product		Yes		
Type of light source		LED		
Rated insulation voltage	V	320		
Pollution degree		3		
Rated impulse withstand voltage	kV	4		
Relative positive tolerance of the operational voltage	%	20		
Relative negative tolerance of the operational voltage	%	20		
Operating time typical	h	100 000		
Vibration resistance acc. to IEC 60068-2-6		10 ... 500 Hz: 5 g		
Shock resistance acc. to IEC 60068-2-27		Half-sine wave 50 g / 11 ms		
Environmental category during operation according to IEC 60721		3M6, 3S2, 3B2, 3K6 (with a relative air humidity of 10 ... 95%, no condensation permitted in operation)		
Ambient temperature				
• During operation	°C	-25 ... +70		
• During storage	°C	-40 ... +80		
IP degree of protection of the terminal		IP20		
Type of electrical connection		Screw terminals 	Spring-type terminals	Socket terminals (THT) 

For further information in the Manual, see <https://support.industry.siemens.com/cs/ww/en/view/107542462>.

• Revised •
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Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Complete Units

Pushbuttons

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Selection and ordering data


Supply voltage for light source		Color	Number of NO contacts	Number of NC contacts	DT	Screw terminals	PU (UNIT, SET, M)	PS*
At AC	At DC							
V	V					Order No.		
Pushbuttons								
Pushbuttons with flat button, momentary contact								
	--	Black	1	0	▶	3SU1100-0AB10-1BA0	1	1 unit
			0	1		3SU1100-0AB10-1CA0	1	1 unit
		Red	1	0	▶	3SU1100-0AB20-1BA0	1	1 unit
			0	1		3SU1100-0AB20-1CA0	1	1 unit
		Yellow	1	0	B	3SU1100-0AB30-1BA0	1	1 unit
		Green	1	0	▶	3SU1100-0AB40-1BA0	1	1 unit
		Blue	1	0	A	3SU1100-0AB50-1BA0	1	1 unit
		White	1	0	A	3SU1100-0AB60-1BA0	1	1 unit
3SU1100-0AB40-1BA0		Clear	1	0	B	3SU1100-0AB70-1BA0	1	1 unit
Pushbuttons with raised button, momentary contact								
	--	Black	0	1	B	3SU1100-0BB10-1CA0	1	1 unit
		Red	0	1	▶	3SU1100-0BB20-1CA0	1	1 unit
		Blue	1	0	B	3SU1100-0BB50-1BA0	1	1 unit
3SU1100-0BB20-1CA0								
Illuminated pushbuttons with flat button, momentary contact with integrated LED								
	24	Red	1	0	▶	3SU1102-0AB20-1BA0	1	1 unit
			0	1		3SU1102-0AB20-1CA0	1	1 unit
		Yellow	1	0	▶	3SU1102-0AB30-1BA0	1	1 unit
		Green	1	0	▶	3SU1102-0AB40-1BA0	1	1 unit
		Blue	1	0	A	3SU1102-0AB50-1BA0	1	1 unit
		White	1	0	A	3SU1102-0AB60-1BA0	1	1 unit
		Clear	1	0	A	3SU1102-0AB70-1BA0	1	1 unit
3SU1102-0AB40-1BA0								
	110	Red	0	1	B	3SU1103-0AB20-1CA0	1	1 unit
		Yellow	1	0	B	3SU1103-0AB30-1BA0	1	1 unit
		Green	1	0	B	3SU1103-0AB40-1BA0	1	1 unit
		Blue	1	0	B	3SU1103-0AB50-1BA0	1	1 unit
		White	1	0	B	3SU1103-0AB60-1BA0	1	1 unit
		Clear	1	0	B	3SU1103-0AB70-1BA0	1	1 unit
3SU1103-0AB20-1CA0								

Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Complete Units

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Pushbuttons

Supply voltage for light source		Color	Number of NO contacts	Number of NC contacts	DT	Screw terminals		PU (UNIT, SET, M)	PS*
At AC	At DC								
V	V					Order No.			

Pushbuttons

Illuminated pushbuttons with flat button, momentary contact with integrated LED



3SU1106-0AB40-1BA0

230	--	Red	0	1	B	3SU1106-0AB20-1CA0		1	1 unit
		Yellow	1	0	B	3SU1106-0AB30-1BA0		1	1 unit
		Green	1	0	B	3SU1106-0AB40-1BA0		1	1 unit
		Blue	1	0	B	3SU1106-0AB50-1BA0		1	1 unit
		White	1	0	B	3SU1106-0AB60-1BA0		1	1 unit
		Clear	1	0	B	3SU1106-0AB70-1BA0		1	1 unit

Spring-type terminals



Pushbuttons with flat button, momentary contact



3SU1100-0AB30-3BA0

--	--	Black	1	0	B	3SU1100-0AB10-3BA0		1	1 unit
			0	1	B	3SU1100-0AB10-3CA0		1	1 unit
		Red	0	1	B	3SU1100-0AB20-3CA0		1	1 unit
		Yellow	1	0	B	3SU1100-0AB30-3BA0		1	1 unit
		Green	1	0	B	3SU1100-0AB40-3BA0		1	1 unit
		Blue	1	0	B	3SU1100-0AB50-3BA0		1	1 unit
		White	1	0	B	3SU1100-0AB60-3BA0		1	1 unit

Illuminated pushbuttons with flat button, momentary contact with integrated LED



3SU1102-0AB20-3CA0

24	24	Red	0	1	B	3SU1102-0AB20-3CA0		1	1 unit
		Yellow	1	0	B	3SU1102-0AB30-3BA0		1	1 unit
		Green	1	0	B	3SU1102-0AB40-3BA0		1	1 unit
		Blue	1	0	B	3SU1102-0AB50-3BA0		1	1 unit
		White	1	0	B	3SU1102-0AB60-3BA0		1	1 unit
		Clear	1	0	B	3SU1102-0AB70-3BA0		1	1 unit

110	--	Red	0	1	B	3SU1103-0AB20-3CA0		1	1 unit
		Green	1	0	B	3SU1103-0AB40-3BA0		1	1 unit
		White	1	0	B	3SU1103-0AB60-3BA0		1	1 unit
		Clear	1	0	B	3SU1103-0AB70-3BA0		1	1 unit
230	--	Red	0	1	B	3SU1106-0AB20-3CA0		1	1 unit
		Green	1	0	B	3SU1106-0AB40-3BA0		1	1 unit
		White	1	0	B	3SU1106-0AB60-3BA0		1	1 unit
		Clear	1	0	B	3SU1106-0AB70-3BA0		1	1 unit

• Revised •
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Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Complete Units

Mushroom pushbuttons /
EMERGENCY STOP mushroom pushbuttons

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Selection and ordering data

Unlatching method	Number of NO contacts	Number of NC contacts	DT	Screw terminals	PU (UNIT, SET, M)	PS*
				Order No.		

Mushroom pushbuttons

With red mushroom, diameter 40 mm, latching



3SU1100-1BA20-3CA0

Pull to unlatch	0	1	▶	3SU1100-1BA20-1CA0	1	1 unit
				Spring-type terminals		
Pull to unlatch	0	1	B	3SU1100-1BA20-3CA0	1	1 unit

Selection and ordering data

Unlatching method	Number of NO contacts	Number of NC contacts	Marking	DT	Screw terminals	PU (UNIT, SET, M)	PS*
					Order No.		

EMERGENCY STOP mushroom pushbuttons, tamper-proof, in accordance with ISO 13850 and IEC 60947-5-5

With red mushroom, diameter 40 mm, with positive latching



3SU1100-1HA20-1CH0

Pull to unlatch	0	1	NOT-HALT	⤵ B	3SU1100-1HA20-1CH0	1	1 unit
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3SU1100-1HB20-1CG0

Rotate to unlatch	0	1	None	⤵ B	3SU1100-1HB20-1CF0	1	1 unit
	0	1	EMERGENCY STOP	⤵ ▶	3SU1100-1HB20-1CG0	1	1 unit
	1	1	EMERGENCY STOP	⤵ B	3SU1100-1HB20-1FG0	1	1 unit



3SU1100-1HB20-3CH0

					Spring-type terminals		
Rotate to unlatch	0	1	NOT-HALT	⤵ ▶	3SU1100-1HB20-3CH0	1	1 unit

⤵ Positive opening according to IEC 60947-5-1, Appendix K.
Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System;
see Catalog IC 14, Chapter 13, "Safety Systems".
Certificate:







Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Complete Units

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Selector switches

Selection and ordering data

Operating principle	Supply voltage	Number of NO contacts	Number of NC contacts	DT	Screw terminals	PU (UNIT, SET, M)	PS*
V					Order No.		
Selector switches							
Short black actuator, 2 switch positions, can be illuminated, white							
 3SU1100-2BF60-1BA0	Latching, 90°	--	1	0	▶ 3SU1100-2BF60-1BA0	1	1 unit
		--	1	1	▶ 3SU1100-2BF60-1MA0	1	1 unit
		--	1	0	B 3SU1103-2BF60-1BA0	1	1 unit
Short black actuator, 3 switch positions, can be illuminated, white							
 3SU1100-2BM60-1NA0	Momentary contact, 2x45°, reset from left + right	--	2	0	▶ 3SU1100-2BM60-1NA0	1	1 unit
	Latching, 2x45°	--	2	0	▶ 3SU1100-2BL60-1NA0	1	1 unit
Short black actuator, 2 switch positions, can be illuminated, white							
 3SU1100-2BF60-3BA0	Latching, 90°	--	1	0	B 3SU1100-2BF60-3BA0	1	1 unit
		--	1	1	B 3SU1100-2BF60-3MA0	1	1 unit
Short black actuator, 3 switch positions, can be illuminated, white							
 3SU1100-2BM60-3NA0	Momentary contact, 2x45°, reset from left + right	--	2	0	B 3SU1100-2BM60-3NA0	1	1 unit
	Latching, 2x45°		2	0	B 3SU1100-2BL60-3NA0	1	1 unit


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Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Complete Units

Key-operated switches

Selection and ordering data

Operating principle	Switch position for key removal	Number of NO contacts	Number of NC contacts	DT	Screw terminals 	PU (UNIT, SET, M)	PS*
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Order No.

Key-operated switches with 2 keys



3SU1100-4BF11-1BA0

With Ronis lock, SB30, 2 switch positions (O+I)

Latching, 90°
(10:30/1:30 o'clock)



O+I

1

0



3SU1100-4BF11-1BA0

1

1 unit

With Ronis lock, SB30, 3 switch positions (I+O+II)

Latching, 2x45°
(10:30/1:30 o'clock)



O+I+II

2

0



3SU1100-4BL11-1NA0

1

1 unit



3SU1100-4BF11-3BA0

With Ronis lock, SB30, 2 switch positions (O+I)

Latching, 90°
(10:30/1:30 o'clock)



O+I

1

0

B

Spring-type terminals

3SU1100-4BF11-3BA0

1

1 unit

Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Complete Units

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Indicator lights

Selection and ordering data

Operational voltage		Color		DT	Screw terminals		PU (UNIT, SET, M)	PS*
At AC, rated value	At DC, rated value	Of actuating element	Of light source					
V					Order No.			
Indicator lights								
With smooth lens and integrated LED								
	24	24	Red	Red	▶	3SU1102-6AA20-1AA0	1	1 unit
			Yellow	Yellow	▶	3SU1102-6AA30-1AA0	1	1 unit
			Green	Green	▶	3SU1102-6AA40-1AA0	1	1 unit
			Blue	Blue	▶	3SU1102-6AA50-1AA0	1	1 unit
			White	White	▶	3SU1102-6AA60-1AA0	1	1 unit
			Clear	White	A	3SU1102-6AA70-1AA0	1	1 unit
3SU1102-6AA30-1AA0								
	110	--	Amber	Amber	▶	3SU1103-6AA00-1AA0	1	1 unit
			Red	Red	A	3SU1103-6AA20-1AA0	1	1 unit
			Yellow	Yellow	A	3SU1103-6AA30-1AA0	1	1 unit
			Green	Green	A	3SU1103-6AA40-1AA0	1	1 unit
			Blue	Blue	B	3SU1103-6AA50-1AA0	1	1 unit
			White	White	A	3SU1103-6AA60-1AA0	1	1 unit
			Clear	White	B	3SU1103-6AA70-1AA0	1	1 unit
3SU1103-6AA00-1AA0								
	230	--	Amber	Amber	▶	3SU1106-6AA00-1AA0	1	1 unit
			Red	Red	A	3SU1106-6AA20-1AA0	1	1 unit
			Yellow	Yellow	A	3SU1106-6AA30-1AA0	1	1 unit
			Green	Green	A	3SU1106-6AA40-1AA0	1	1 unit
			Blue	Blue	B	3SU1106-6AA50-1AA0	1	1 unit
			White	White	A	3SU1106-6AA60-1AA0	1	1 unit
			Clear	White	B	3SU1106-6AA70-1AA0	1	1 unit
3SU1106-6AA50-1AA0								
					Spring-type terminals 			
	24	24	Red	Red	B	3SU1102-6AA20-3AA0	1	1 unit
			Yellow	Yellow	B	3SU1102-6AA30-3AA0	1	1 unit
			Green	Green	B	3SU1102-6AA40-3AA0	1	1 unit
			Blue	Blue	B	3SU1102-6AA50-3AA0	1	1 unit
			White	White	B	3SU1102-6AA60-3AA0	1	1 unit
			Clear	White	B	3SU1102-6AA70-3AA0	1	1 unit
3SU1102-6AA20-3AA0								
	110	--	Red	Red	B	3SU1103-6AA20-3AA0	1	1 unit
			Yellow	Yellow	B	3SU1103-6AA30-3AA0	1	1 unit
			Green	Green	B	3SU1103-6AA40-3AA0	1	1 unit
			Blue	Blue	B	3SU1103-6AA50-3AA0	1	1 unit
			White	White	B	3SU1103-6AA60-3AA0	1	1 unit
			Clear	White	B	3SU1103-6AA70-3AA0	1	1 unit
3SU1102-6AA40-3AA0								
	230	--	Red	Red	B	3SU1106-6AA20-3AA0	1	1 unit
			Yellow	Yellow	B	3SU1106-6AA30-3AA0	1	1 unit
			Green	Green	B	3SU1106-6AA40-3AA0	1	1 unit
			Blue	Blue	B	3SU1106-6AA50-3AA0	1	1 unit
			White	White	B	3SU1106-6AA60-3AA0	1	1 unit
			Clear	White	B	3SU1106-6AA70-3AA0	1	1 unit
3SU1106-6AA60-3AA0								

• Revised •
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Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Compact Units

Sensor switches / Potentiometers

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Selection and ordering data

Operating principle	Number of NO contacts	Number of NC contacts	Color	DT	M12 connector, 4-pole	PU (UNIT, SET, M)	PS*
Order No.							

Sensor switches



3SU1200-1SK10-2SA0

Whether integrated in the two-hand operation console or installed as a door opening contact, the capacitive sensor switch is suitable for many different applications in industrial environments.

The switch is actuated by simple contact with the hand or other part of the body (i.e. without the application of pressure). As a result, these switches are rugged, extremely durable and have the highest degree of protection IP66, IP67, IP69 (IP69K).

Without pressure	1	0	Black	A	3SU1200-1SK10-2SA0	1	1 unit
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For optional accessories, see

"Protection for sensor switches" on page 13/122

"Connectors for sensor switches, angled socket with screw terminal connection" on page 13/128

Selection and ordering data

Version of actuating element	Operating principle	Adjustable resistance	DT	Screw terminals	PU (UNIT, SET, M)	PS*
kΩ				Order No.		

Potentiometers



3SU1200-2PQ10-1AA0

Rotary knob	Stepless	1	B	3SU1200-2PQ10-1AA0	1	1 unit
		2.2	B	3SU1200-2PW10-1AA0	1	1 unit
		4.7	B	3SU1200-2PR10-1AA0	1	1 unit
		10	B	3SU1200-2PS10-1AA0	1	1 unit
		47	B	3SU1200-2PT10-1AA0	1	1 unit
		100	B	3SU1200-2PU10-1AA0	1	1 unit
		470	B	3SU1200-2PV10-1AA0	1	1 unit

Labeling plates for potentiometers



3SU1900-0BG16-0RU0

Black/White (label/lettering)	None	40	--	▶	3SU1900-0BG16-0AA0	1	10 units
			SYMBOL: 0 ... 9	B	3SU1900-0BG16-0RT0	1	10 units
			SYMBOL: Power up	B	3SU1900-0BG16-0RU0	1	10 units




Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Compact Units

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Pushbuttons with extended stroke

Selection and ordering data

Version		Color	DT	Order No.	PU (UNIT, SET, M)	PS*	
Pushbuttons with extended stroke							
	Pushbuttons with flat button	Red	B	3SU1200-0EB20-0AA0	1	1 unit	
		Green	B	3SU1200-0EB40-0AA0	1	1 unit	
	Pushbuttons with raised button	Black	A	3SU1200-0FB10-0AA0	1	1 unit	
		Red	A	3SU1200-0FB20-0AA0	1	1 unit	
	Pushbuttons with flat transparent button for insertion of insert labels	Red	A	3SU1201-0EB20-0AA0	1	1 unit	
		Clear	A	3SU1201-0EB70-0AA0	1	1 unit	
Version		Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Accessories							
	Extension plungers	Plastic	Black	A	3SU1900-0KG10-0AA0	1	1 unit
3SU1200-0EB20-0AA0							
3SU1200-0FB10-0AA0							
3SU1201-0EB70-0AA0							
3SU1900-0KG10-0AA0							

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Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

Pushbuttons

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Selection and ordering data



Version of actuating element Front ring version		Operating principle Unlatching method	Color, marking	DT	Order No.	PU (UNIT, SET, M)	PS*
Pushbuttons							
 3SU1000-0AB20-0AD0	Pushbuttons with flat button Standard	Momentary contact	Black	▶	3SU1000-0AB10-0AA0	1	1 unit
			Black, O	B	3SU1000-0AB10-0AD0	1	1 unit
			Red	▶	3SU1000-0AB20-0AA0	1	1 unit
			Red, O	A	3SU1000-0AB20-0AD0	1	1 unit
			Yellow	▶	3SU1000-0AB30-0AA0	1	1 unit
			Green	▶	3SU1000-0AB40-0AA0	1	1 unit
			Green, I	A	3SU1000-0AB40-0AC0	1	1 unit
			Blue	▶	3SU1000-0AB50-0AA0	1	1 unit
			Blue, R	▶	3SU1000-0AB50-0AR0	1	1 unit
			White	▶	3SU1000-0AB60-0AA0	1	1 unit
			White, I	B	3SU1000-0AB60-0AC0	1	1 unit
			Clear	A	3SU1000-0AB70-0AA0	1	1 unit
			Gray	B	3SU1000-0AB80-0AA0	1	1 unit
 3SU1000-0AA30-0AA0		Latching	Black	▶	3SU1000-0AA10-0AA0	1	1 unit
		Push to unlatch	Red	▶	3SU1000-0AA20-0AA0	1	1 unit
			Yellow	▶	3SU1000-0AA30-0AA0	1	1 unit
			Green	▶	3SU1000-0AA40-0AA0	1	1 unit
			Blue	▶	3SU1000-0AA50-0AA0	1	1 unit
			White	▶	3SU1000-0AA60-0AA0	1	1 unit
 3SU1000-0BB30-0AA0	Pushbuttons with raised button Standard	Momentary contact	Black	▶	3SU1000-0BB10-0AA0	1	1 unit
			Red	▶	3SU1000-0BB20-0AA0	1	1 unit
			Yellow	▶	3SU1000-0BB30-0AA0	1	1 unit
			Green	▶	3SU1000-0BB40-0AA0	1	1 unit
			Blue	▶	3SU1000-0BB50-0AA0	1	1 unit
			White	▶	3SU1000-0BB60-0AA0	1	1 unit
 3SU1000-0CB40-0AA0	Pushbuttons with flat button Raised	Momentary contact	Black	B	3SU1000-0CB10-0AA0	1	1 unit
			Red	B	3SU1000-0CB20-0AA0	1	1 unit
			Yellow	B	3SU1000-0CB30-0AA0	1	1 unit
			Green	B	3SU1000-0CB40-0AA0	1	1 unit
			Blue	B	3SU1000-0CB50-0AA0	1	1 unit
			White	B	3SU1000-0CB60-0AA0	1	1 unit
 3SU1000-0DB50-0AA0	Pushbuttons with flat button Raised, castellated	Momentary contact	Black	B	3SU1000-0DB10-0AA0	1	1 unit
			Red	B	3SU1000-0DB20-0AA0	1	1 unit
			Yellow	B	3SU1000-0DB30-0AA0	1	1 unit
			Green	B	3SU1000-0DB40-0AA0	1	1 unit
			Blue	B	3SU1000-0DB50-0AA0	1	1 unit
			White	B	3SU1000-0DB60-0AA0	1	1 unit

Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

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Pushbuttons

Version of actuating element Front ring version		Operating principle Unlatching method	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Pushbuttons							
	Illuminated pushbuttons with flat button Standard	Momentary contact	Amber	▶	3SU1001-0AB00-0AA0	1	1 unit
			Red	A	3SU1001-0AB20-0AA0	1	1 unit
			Yellow	▶	3SU1001-0AB30-0AA0	1	1 unit
			Green	▶	3SU1001-0AB40-0AA0	1	1 unit
			Blue	▶	3SU1001-0AB50-0AA0	1	1 unit
			White	▶	3SU1001-0AB60-0AA0	1	1 unit
			Clear	▶	3SU1001-0AB70-0AA0	1	1 unit
3SU1001-0AB40-0AA0							
		Latching	Red	▶	3SU1001-0AA20-0AA0	1	1 unit
		Push to unlatch	Yellow	B	3SU1001-0AA30-0AA0	1	1 unit
			Green	▶	3SU1001-0AA40-0AA0	1	1 unit
			Blue	▶	3SU1001-0AA50-0AA0	1	1 unit
			White	▶	3SU1001-0AA60-0AA0	1	1 unit
			Clear	B	3SU1001-0AA70-0AA0	1	1 unit
			3SU1001-0AA20-0AA0				
	Illuminated pushbuttons with raised button Standard	Momentary contact	Red	▶	3SU1001-0BB20-0AA0	1	1 unit
			Yellow	▶	3SU1001-0BB30-0AA0	1	1 unit
			Green	▶	3SU1001-0BB40-0AA0	1	1 unit
			Blue	▶	3SU1001-0BB50-0AA0	1	1 unit
			Clear	▶	3SU1001-0BB70-0AA0	1	1 unit
3SU1001-0BB70-0AA0							
	Illuminated pushbuttons with flat button Raised, castellated	Momentary contact	Blue	B	3SU1001-0DB50-0AA0	1	1 unit
3SU1001-0DB50-0AA0							
	Stop pushbuttons Standard	momentary contact, latching by pressing in and turning to the right, rotate-to-unlatch to the left	Black	B	3SU1000-0HC10-0AA0	1	1 unit
			Red	B	3SU1000-0HC20-0AA0	1	1 unit
3SU1000-0HC10-0AA0							

• Revised •
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Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

Twin pushbuttons

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Selection and ordering data

	Version of actuating element	Operating principle	Color	Marking	DT	Order No.	PU (UNIT, SET, M)	PS*
Twin pushbuttons								
	Twin pushbuttons flat, flat	Momentary contact	Green / Red	-- I / O	B ▶	3SU1000-3AB42-0AA0 3SU1000-3AB42-0AK0	1 1	1 unit 1 unit
			White / Black	-- I / O	B ▶	3SU1000-3AB61-0AA0 3SU1000-3AB61-0AK0	1 1	1 unit 1 unit
			White / White	-- - / + Arrows, hor. Arrows, vert.	B B B B	3SU1000-3AB66-0AA0 3SU1000-3AB66-0AL0 3SU1000-3AB66-0AM0 3SU1000-3AB66-0AN0	1 1 1 1	1 unit 1 unit 1 unit 1 unit
			Black / Black	-- ○ ○ 5264 / 5265 (IEC 60417)	B B B B	3SU1000-3AB11-0AA0 3SU1000-3AB11-0AQ0	1 1	1 unit 1 unit
	Twin pushbuttons flat, raised	Momentary contact	Green / Red	-- I / O	B ▶	3SU1000-3BB42-0AA0 3SU1000-3BB42-0AK0	1 1	1 unit 1 unit
			White / Black	-- I / O	B ▶	3SU1000-3BB61-0AA0 3SU1000-3BB61-0AK0	1 1	1 unit 1 unit
	Twin pushbuttons flat, flat, illuminated	Momentary contact	Green / Red	-- I / O Arrows, vert.	B ▶ B	3SU1001-3AB42-0AA0 3SU1001-3AB42-0AK0 3SU1001-3AB42-0AN0	1 1 1	1 unit 1 unit 1 unit
			White / Black	-- I / O	B ▶	3SU1001-3AB61-0AA0 3SU1001-3AB61-0AK0	1 1	1 unit 1 unit
			White / White	-- - / + Arrows, vert.	B B B	3SU1001-3AB66-0AA0 3SU1001-3AB66-0AL0 3SU1001-3AB66-0AN0	1 1 1	1 unit 1 unit 1 unit
				Symbols "Circular saw blade" / "Tilt tipper"	B	3SU1001-3AB66-0AP0	1	1 unit
	Twin pushbuttons flat, raised, illuminated	Momentary contact	Green / Red	-- I / O	B ▶	3SU1001-3BB42-0AA0 3SU1001-3BB42-0AK0	1 1	1 unit 1 unit
			White / Black	-- I / O	B ▶	3SU1001-3BB61-0AA0 3SU1001-3BB61-0AK0	1 1	1 unit 1 unit







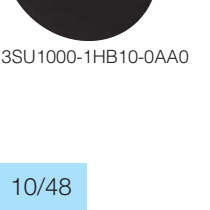

Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

• Revised •
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Mushroom pushbuttons

Selection and ordering data

	Version of actuating element	Operating principle Unlatching method	Color, marking	DT	Order No.	PU (UNIT, SET, M)	PS*
Mushroom pushbuttons							
	Mushroom pushbuttons 30 mm diameter, 2 positions	Momentary contact	Black	▶	3SU1000-1AD10-0AA0	1	1 unit
			Red	▶	3SU1000-1AD20-0AA0	1	1 unit
			Yellow	▶	3SU1000-1AD30-0AA0	1	1 unit
			Green	B	3SU1000-1AD40-0AA0	1	1 unit
	Mushroom pushbuttons 30 mm diameter, 2 positions	Latching, Pull to unlatch	Black	▶	3SU1000-1AA10-0AA0	1	1 unit
			Red	▶	3SU1000-1AA20-0AA0	1	1 unit
			Yellow	B	3SU1000-1AA30-0AA0	1	1 unit
	Mushroom pushbuttons 40 mm diameter, 2 positions	Momentary contact	Black	▶	3SU1000-1BD10-0AA0	1	1 unit
			Red	▶	3SU1000-1BD20-0AA0	1	1 unit
			Yellow	B	3SU1000-1BD30-0AA0	1	1 unit
			Green	▶	3SU1000-1BD40-0AA0	1	1 unit
	Mushroom pushbuttons 40 mm diameter, 2 positions	Latching, Pull to unlatch	Black	A	3SU1000-1BA10-0AA0	1	1 unit
			Red	▶	3SU1000-1BA20-0AA0	1	1 unit
			Red, O	B	3SU1000-1BA20-0AD0	1	1 unit
			Yellow	B	3SU1000-1BA30-0AA0	1	1 unit
	Mushroom pushbuttons 40 mm diameter, 2 positions	Pull to unlatch	Green	B	3SU1000-1BA40-0AA0	1	1 unit
	Mushroom pushbuttons 60 mm diameter, 2 positions	Momentary contact	Black	▶	3SU1000-1CD10-0AA0	1	1 unit
			Red	▶	3SU1000-1CD20-0AA0	1	1 unit
			Yellow	B	3SU1000-1CD30-0AA0	1	1 unit
			Green	B	3SU1000-1CD40-0AA0	1	1 unit
	Mushroom pushbuttons 60 mm diameter, 2 positions	Latching, Pull to unlatch	Black	B	3SU1000-1CA10-0AA0	1	1 unit
			Red	B	3SU1000-1CA20-0AA0	1	1 unit
	Mushroom pushbuttons 30 mm diameter, 2 positions, illuminated	Momentary contact	Red	B	3SU1001-1AD20-0AA0	1	1 unit
			Yellow	▶	3SU1001-1AD30-0AA0	1	1 unit
			Green	B	3SU1001-1AD40-0AA0	1	1 unit
			Blue	B	3SU1001-1AD50-0AA0	1	1 unit
	Mushroom pushbuttons 30 mm diameter, 2 positions, illuminated	Latching, Pull to unlatch	White	B	3SU1001-1AD60-0AA0	1	1 unit
			Clear	B	3SU1001-1AD70-0AA0	1	1 unit
			Red	▶	3SU1001-1AA20-0AA0	1	1 unit
			Yellow	B	3SU1001-1AA30-0AA0	1	1 unit
	Mushroom pushbuttons 30 mm diameter, 2 positions, illuminated	Pull to unlatch	Green	B	3SU1001-1AA40-0AA0	1	1 unit
			Blue	B	3SU1001-1AA50-0AA0	1	1 unit
			Clear	B	3SU1001-1AA70-0AA0	1	1 unit
	Mushroom pushbuttons 40 mm diameter, 2 positions, illuminated	Momentary contact	Yellow	B	3SU1001-1BD30-0AA0	1	1 unit
			Green	B	3SU1001-1BD40-0AA0	1	1 unit
			White	B	3SU1001-1BD60-0AA0	1	1 unit
			Clear	B	3SU1001-1BD70-0AA0	1	1 unit
	Mushroom pushbuttons 40 mm diameter, 2 positions, illuminated	Latching, Pull to unlatch	Red	▶	3SU1001-1BA20-0AA0	1	1 unit
			Yellow	B	3SU1001-1BA30-0AA0	1	1 unit
			Green	B	3SU1001-1BA40-0AA0	1	1 unit
			Blue	B	3SU1001-1BA50-0AA0	1	1 unit
	Mushroom pushbuttons 40 mm diameter, 2 positions, illuminated	Pull to unlatch	Clear	B	3SU1001-1BA70-0AA0	1	1 unit
	Mushroom pushbuttons with raised mushroom, 40 mm diameter, 2 positions	With positive latching, tamper-proof Rotate to unlatch	Black	A	3SU1000-1HB10-0AA0	1	1 unit
			Blue	B	3SU1000-1HB50-0AA0	1	1 unit

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Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

EMERGENCY STOP mushroom pushbuttons

Selection and ordering data

Version of actuating element	Outer diameter of mushroom mm	Make of lock	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
EMERGENCY STOP mushroom pushbuttons							
With pull-to-unlatch mechanism							
Tamper-proof, 2 positions	40	--	Red	▶	3SU1000-1HA20-0AA0	1	1 unit
With rotate-to-unlatch mechanism							
Tamper-proof, 2 positions	33.8	--	Red	▶	3SU1000-1GB20-0AA0	1	1 unit
	40	--	Red	▶	3SU1000-1HB20-0AA0	1	1 unit
	60	--	Red	A	3SU1000-1JB20-0AA0	1	1 unit
With rotate-to-unlatch mechanism, can be illuminated							
Tamper-proof, 2 positions	33.8	--	Red	B	3SU1001-1GB20-0AA0	1	1 unit
	40	--	Red	A	3SU1001-1HB20-0AA0	1	1 unit
	60	--	Red	B	3SU1001-1JB20-0AA0	1	1 unit



3SU1000-1HA20-0AA0



3SU1000-1GB20-0AA0



3SU1000-1HB20-0AA0



3SU1000-1JB20-0AA0







3SU1001-1HB20-0AA0

Push Button Units and Indicator Lights


3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

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EMERGENCY STOP mushroom pushbuttons

Version of actuating element	Outer diameter of mushroom mm	Make of lock	Color	Number of keys	DT	Order No.	PU (UNIT, SET, M)	PS*
EMERGENCY STOP mushroom pushbuttons, in accordance with ISO 13850 and IEC 60947-5-5								
With key-operated release								
	Tamper-proof, 2 positions	40	RONIS SB30	Red	2	▶ 3SU1000-1HF20-0AA0	1	1 unit
			RONIS 455	Red	2	B 3SU1000-1HG20-0AA0	1	1 unit
			BKS S1	Red	2	A 3SU1000-1HK20-0AA0	1	1 unit
			O.M.R. 73037	Red	2	A 3SU1000-1HQ20-0AA0	1	1 unit
			CES SSG10	Red	2	▶ 3SU1000-1HR20-0AA0	1	1 unit
			CES SSP9	Red	2	A 3SU1000-1HS20-0AA0	1	1 unit
			CES SMS1	Red	2	B 3SU1000-1HT20-0AA0	1	1 unit

Selection and ordering data

Number of switching positions	Number of command points	Color of actuating element	Operating principle of the actuating element	DT	Order No.	PU (UNIT, SET, M)	PS*
Toggle switches							
	2	1	Black	Latching	B 3SU1000-3EA10-0AA0	1	1 unit
				Momentary contact Reset from above	B 3SU1000-3EC10-0AA0	1	1 unit

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Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

Selector switches

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Selection and ordering data

Version of actuator	Operating principle	Color	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Selector switches							
2 switch positions, can be illuminated							
	Selector, short black actuator	Momentary contact, 45° (10:30/12 o'clock), reset from center to left 	Black	B	3SU1002-2BC10-0AA0	1	1 unit
			Red	B	3SU1002-2BC20-0AA0	1	1 unit
			Yellow	B	3SU1002-2BC30-0AA0	1	1 unit
			Green	B	3SU1002-2BC40-0AA0	1	1 unit
			Blue	B	3SU1002-2BC50-0AA0	1	1 unit
			White	▶	3SU1002-2BC60-0AA0	1	1 unit
	Selector, long black actuator	Latching, 90° (10:30/1:30 o'clock) 	Black	▶	3SU1002-2BF10-0AA0	1	1 unit
			Red	▶	3SU1002-2BF20-0AA0	1	1 unit
			Yellow	B	3SU1002-2BF30-0AA0	1	1 unit
			Green	A	3SU1002-2BF40-0AA0	1	1 unit
			Blue	A	3SU1002-2BF50-0AA0	1	1 unit
			White	▶	3SU1002-2BF60-0AA0	1	1 unit
	Selector, long black actuator	Latching, 90° (10:30/1:30 o'clock) 	Black	B	3SU1002-2CF10-0AA0	1	1 unit
			Red	B	3SU1002-2CF20-0AA0	1	1 unit
			White	B	3SU1002-2CF60-0AA0	1	1 unit
	Rotary knob	Latching, 90° (10:30/1:30 o'clock) 	Red	B	3SU1002-2AF20-0AA0	1	1 unit
			White	A	3SU1002-2AF60-0AA0	1	1 unit

Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

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Selector switches

Version of actuator	Operating principle	Color	DT	Order No.	PU (UNIT, SET, M)	PS*	
Selector switches							
3 switch positions, can be illuminated							
	Selector, short black actuator	Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right + left	Black Red Yellow Green Blue White	B B B A B ▶	3SU1002-2BM10-0AA0 3SU1002-2BM20-0AA0 3SU1002-2BM30-0AA0 3SU1002-2BM40-0AA0 3SU1002-2BM50-0AA0 3SU1002-2BM60-0AA0	1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
		Latching, 2x45° (10:30/12/1:30 o'clock)	Black Red Yellow Green Blue White	▶ ▶ B A A ▶	3SU1002-2BL10-0AA0 3SU1002-2BL20-0AA0 3SU1002-2BL30-0AA0 3SU1002-2BL40-0AA0 3SU1002-2BL50-0AA0 3SU1002-2BL60-0AA0	1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
		Momentary contact/latching, 2x45° (10:30/12/1:30 o'clock), reset from left, latching to right	Black Red Yellow Green Blue White	B B B B B ▶	3SU1002-2BP10-0AA0 3SU1002-2BP20-0AA0 3SU1002-2BP30-0AA0 3SU1002-2BP40-0AA0 3SU1002-2BP50-0AA0 3SU1002-2BP60-0AA0	1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
		Latching/momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right, latching to left	Black Red Yellow Green Blue White	B B B ▶ B ▶	3SU1002-2BN10-0AA0 3SU1002-2BN20-0AA0 3SU1002-2BN30-0AA0 3SU1002-2BN40-0AA0 3SU1002-2BN50-0AA0 3SU1002-2BN60-0AA0	1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
4 switch positions							
	Rotary knob	Latching, 4x90° (0-position: 3/6/9/12 o'clock)	White	B	3SU1000-2AS60-0AA0	1	1 unit

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Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

Key-operated switches

Selection and ordering data



Operating principle	Make of lock	Switch position for key removal	Number of keys	DT	Order No.	PU (UNIT, SET, M)	PS*
Key-operated switches							
2 switch positions (O+I)							
 3SU1000-4JC01-0AA0	Momentary contact, 45° (10:30/12 o'clock), reset from center to left 	RONIS, SB30	O	2	►	3SU1000-4BC01-0AA0	1 1 unit
		RONIS, 455	O	2	B	3SU1000-4CC01-0AA0	1 1 unit
		O.M.R. 73037, red	O	2	B	3SU1000-4FC01-0AA0	1 1 unit
		O.M.R. 73038, light blue	O	2	B	3SU1000-4GC01-0AA0	1 1 unit
		O.M.R. 73034, black	O	2	B	3SU1000-4HC01-0AA0	1 1 unit
		O.M.R. 73033, yellow	O	2	B	3SU1000-4JC01-0AA0	1 1 unit
 3SU1000-4BF11-0AA0	Latching, 90° (10:30/1:30 o'clock) 	CES, SSG10	O	2	►	3SU1000-5BC01-0AA0	1 1 unit
		CES, LSG1		2	B	3SU1000-5HC01-0AA0	1 1 unit
		BKS, S1	O	2	A	3SU1000-5PC01-0AA0	1 1 unit
		IKON, 360012K1	O	2	A	3SU1000-5XC01-0AA0	1 1 unit
		RONIS, SB30	O	2	A	3SU1000-4BF01-0AA0	1 1 unit
			O+I	2	►	3SU1000-4BF11-0AA0	1 1 unit
 3SU1000-4GF11-0AA0		RONIS, 455	I	2	A	3SU1000-4BF21-0AA0	1 1 unit
			O	2	B	3SU1000-4CF01-0AA0	1 1 unit
			O+I	2	B	3SU1000-4CF11-0AA0	1 1 unit
		RONIS, 421	O+I	2	B	3SU1000-4DF11-0AA0	1 1 unit
		O.M.R. 73037, red	O	2	B	3SU1000-4FF01-0AA0	1 1 unit
			O+I	2	B	3SU1000-4FF11-0AA0	1 1 unit
 3SU1000-5BF11-0AA0		O.M.R. 73038, light blue	O	2	►	3SU1000-4GF01-0AA0	1 1 unit
			O+I	2	B	3SU1000-4GF11-0AA0	1 1 unit
		O.M.R. 73034, black	O	2	B	3SU1000-4HF01-0AA0	1 1 unit
			O+I	2	B	3SU1000-4HF11-0AA0	1 1 unit
			I	2	B	3SU1000-4HF21-0AA0	1 1 unit
		O.M.R. 73033, yellow	O	2	B	3SU1000-4JF01-0AA0	1 1 unit
 3SU1000-5PF11-0AA0			O+I	2	B	3SU1000-4JF11-0AA0	1 1 unit
		CES, SSG10	O	2	►	3SU1000-5BF01-0AA0	1 1 unit
			O+I	2	►	3SU1000-5BF11-0AA0	1 1 unit
			I	2	►	3SU1000-5BF21-0AA0	1 1 unit
		CES, LSG1	O	2	A	3SU1000-5HF01-0AA0	1 1 unit
			O+I	2	A	3SU1000-5HF11-0AA0	1 1 unit
		BKS, S1	O	2	A	3SU1000-5PF01-0AA0	1 1 unit
			O+I	2	A	3SU1000-5PF11-0AA0	1 1 unit
			I	2	B	3SU1000-5PF21-0AA0	1 1 unit
		IKON, 360012K1	O	2	A	3SU1000-5XF01-0AA0	1 1 unit
			O+I	2	A	3SU1000-5XF11-0AA0	1 1 unit

Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

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Key-operated switches

Operating principle	Make of lock	Switch position for key removal	DT	Order No.	PU (UNIT, SET, M)	PS*	
Key-operated switches							
3 switch positions (I+O+II)							
<p>Momentary contact, 2x45°(10:30/12/ 1:30 o'clock), reset from left + right</p> 	RONIS, SB30	O	A	3SU1000-4BM01-0AA0	1	1 unit	
	O.M.R. 73037, red	O	B	3SU1000-4FM01-0AA0	1	1 unit	
	O.M.R. 73034, black	O	▶	3SU1000-4HM01-0AA0	1	1 unit	
	CES, SSG10	O	A	3SU1000-5BM01-0AA0	1	1 unit	
	BKS, S1	O	B	3SU1000-5PM01-0AA0	1	1 unit	
	IKON, 360012K1	O	B	3SU1000-5XM01-0AA0	1	1 unit	
<p>Latching, 2x45° (10:30/12/ 1:30 o'clock)</p> 	RONIS, SB30	O	B	3SU1000-4BL01-0AA0	1	1 unit	
		O+I+II	▶	3SU1000-4BL11-0AA0	1	1 unit	
		I	▶	3SU1000-4BL21-0AA0	1	1 unit	
		II (right)	B	3SU1000-4BL31-0AA0	1	1 unit	
	RONIS, 455	I+II (left, right)	B	3SU1000-4BL41-0AA0	1	1 unit	
		O+I (center, left)	B	3SU1000-4BL51-0AA0	1	1 unit	
		O	B	3SU1000-4CL01-0AA0	1	1 unit	
		O+I+II	B	3SU1000-4CL11-0AA0	1	1 unit	
	O.M.R. 73037, red	O	B	3SU1000-4FL01-0AA0	1	1 unit	
		O+I (center, left)	▶	3SU1000-4FL51-0AA0	1	1 unit	
		O	B	3SU1000-4GL01-0AA0	1	1 unit	
		O+I+II	B	3SU1000-4GL11-0AA0	1	1 unit	
		O.M.R. 73034, black	O	B	3SU1000-4HL01-0AA0	1	1 unit
		O+I+II	B	3SU1000-4HL11-0AA0	1	1 unit	
		O.M.R. 73033, yellow	O+I+II	B	3SU1000-4JL11-0AA0	1	1 unit
		CES, SSG10	O	▶	3SU1000-5BL01-0AA0	1	1 unit
	O+I+II		▶	3SU1000-5BL11-0AA0	1	1 unit	
	I		▶	3SU1000-5BL21-0AA0	1	1 unit	
	II (right)		▶	3SU1000-5BL31-0AA0	1	1 unit	
I+II (left, right)	▶		3SU1000-5BL41-0AA0	1	1 unit		
O+I (center, left)	B		3SU1000-5BL51-0AA0	1	1 unit		
BKS, S1	O	B	3SU1000-5PL01-0AA0	1	1 unit		
	O+I+II	B	3SU1000-5PL11-0AA0	1	1 unit		
	I	B	3SU1000-5PL21-0AA0	1	1 unit		
	II (right)	B	3SU1000-5PL31-0AA0	1	1 unit		
	I+II (left, right)	B	3SU1000-5PL41-0AA0	1	1 unit		
	IKON, 360012K1	O	B	3SU1000-5XL01-0AA0	1	1 unit	
O+I+II		B	3SU1000-5XL11-0AA0	1	1 unit		

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Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

Key-operated switches /
ID key-operated switches

1
2
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Key-operated switches

3 switch positions (I+O+II)



3SU1000-4BP01-0AA0



3SU1000-5BP01-0AA0



3SU1000-4GN01-0AA0

Momentary contact/
latching, 2x45°
(10:30/12/
1:30 o'clock),
reset from left,
latching to the right



RONIS, SB30

O
II (right)
O+II (center, right)

B
B
B

3SU1000-4BP01-0AA0
3SU1000-4BP31-0AA0
3SU1000-4BP61-0AA0

1 1 unit
1 1 unit
1 1 unit

CES, SSG10

O
II (right)
O+II (center, right)

B
B
B

3SU1000-5BP01-0AA0
3SU1000-5BP31-0AA0
3SU1000-5BP61-0AA0

1 1 unit
1 1 unit
1 1 unit

BKS, S1

O

B

3SU1000-5PP01-0AA0

1 1 unit

Latching/momentary
contact, 2x45°
(10:30/12/
1:30 o'clock),
reset from right, latch-
ing to the left



RONIS, SB30

O
I
O+I (center, left)

B
B
B

3SU1000-4BN01-0AA0
3SU1000-4BN21-0AA0
3SU1000-4BN51-0AA0

1 1 unit
1 1 unit
1 1 unit

O.M.R. 73038,
light blue
O.M.R. 73034,
black

O
I

B
B

3SU1000-4GN01-0AA0
3SU1000-4HN21-0AA0

1 1 unit
1 1 unit

CES, SSG10

O
I
O+I (center, left)

B
B
B

3SU1000-5BN01-0AA0
3SU1000-5BN21-0AA0
3SU1000-5BN51-0AA0

1 1 unit
1 1 unit
1 1 unit

BKS, S1

I
O+I (center, left)

B
B

3SU1000-5PN21-0AA0
3SU1000-5PN51-0AA0

1 1 unit
1 1 unit

IKON, 360012K1

O+I (center, left)

B

3SU1000-5XN51-0AA0

1 1 unit

Selection and ordering data

Operating angle	Operating principle	Switch position for key removal	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
-----------------	---------------------	---------------------------------	-------	----	-----------	-------------------	-----

ID key-operated switches

4 switch positions (O+I+II+III)



3SU1000-4WS10-0AA0

45°

Latching

O+I+II+III

Black

A

3SU1000-4WS10-0AA0

1 1 unit

For available keys, [see page 10/143](#)

For electronic modules for ID key-operated switches,
[see page 10/109](#)

Push Button Units and Indicator Lights

3SU1 22 mm, Round, Plastic, Black — Actuating & Signaling Elements

• Revised •
07/15/16

Indicator lights

Selection and ordering data

Version of actuating element	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Indicator lights					
 <p>Indicator lights with smooth lens</p> <p>3SU1001-6AA40-0AA0</p>	Amber	▶	3SU1001-6AA00-0AA0	1	1 unit
	Red	▶	3SU1001-6AA20-0AA0	1	1 unit
	Yellow	▶	3SU1001-6AA30-0AA0	1	1 unit
	Green	▶	3SU1001-6AA40-0AA0	1	1 unit
	Blue	▶	3SU1001-6AA50-0AA0	1	1 unit
	White	▶	3SU1001-6AA60-0AA0	1	1 unit
	Clear	▶	3SU1001-6AA70-0AA0	1	1 unit

• Revised •
08/31/15

Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

Pushbuttons

1
2
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Selection and ordering data

Supply voltage for light source		Color	Number of NO contacts	Number of NC contacts	DT	Screw terminals		PU (UNIT, SET, M)	PS*
At AC	At DC								
V	V					Order No.			
Pushbuttons									
Pushbuttons with flat button, momentary contact									
	--	--	Black	1	0	▶	3SU1130-0AB10-1BA0	1	1 unit
				0	1		3SU1130-0AB10-1CA0	1	1 unit
			Red	1	0	B	3SU1130-0AB20-1BA0	1	1 unit
				0	1	▶	3SU1130-0AB20-1CA0	1	1 unit
			Yellow	1	0	▶	3SU1130-0AB30-1BA0	1	1 unit
			Green	1	0	▶	3SU1130-0AB40-1BA0	1	1 unit
			Blue	1	0	▶	3SU1130-0AB50-1BA0	1	1 unit
			White	1	0	▶	3SU1130-0AB60-1BA0	1	1 unit
Pushbuttons with raised button, momentary contact									
	--	--	Red	0	1	▶	3SU1130-0BB20-1CA0	1	1 unit
Illuminated pushbuttons with flat button, momentary contact with integrated LED									
	24	24	Red	1	0	B	3SU1132-0AB20-1BA0	1	1 unit
				0	1	▶	3SU1132-0AB20-1CA0	1	1 unit
			Yellow	1	0	▶	3SU1132-0AB30-1BA0	1	1 unit
			Green	1	0	▶	3SU1132-0AB40-1BA0	1	1 unit
			Blue	1	0	▶	3SU1132-0AB50-1BA0	1	1 unit
			White	1	0	▶	3SU1132-0AB60-1BA0	1	1 unit
			Clear	1	0	▶	3SU1132-0AB70-1BA0	1	1 unit
				110	--	Red	0	1	B
Yellow	1	0				B	3SU1133-0AB30-1BA0	1	1 unit
Green	1	0				B	3SU1133-0AB40-1BA0	1	1 unit
Blue	1	0				B	3SU1133-0AB50-1BA0	1	1 unit
White	1	0				B	3SU1133-0AB60-1BA0	1	1 unit
Clear	1	0				B	3SU1133-0AB70-1BA0	1	1 unit

Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

• Revised •
08/31/15

Actuators and Indicators

Supply voltage for light source		Color	Number of NO contacts	Number of NC contacts	DT	Screw terminals		PU (UNIT, SET, M)	PS*
At AC	At DC								
V	V					Order No.			

Pushbuttons									
Illuminated pushbuttons with flat button, momentary contact with integrated LED									
	230	--	Red	0	1	B	3SU1136-0AB20-1CA0	1	1 unit
			Yellow	1	0	B	3SU1136-0AB30-1BA0	1	1 unit
			Green	1	0	B	3SU1136-0AB40-1BA0	1	1 unit
			Blue	1	0	B	3SU1136-0AB50-1BA0	1	1 unit
			White	1	0	B	3SU1136-0AB60-1BA0	1	1 unit
			Clear	1	0	B	3SU1136-0AB70-1BA0	1	1 unit
							Spring-type terminals		
									

Pushbuttons with flat button, momentary contact									
	--	--	Black	1	0	B	3SU1130-0AB10-3BA0	1	1 unit
			Red	0	1	B	3SU1130-0AB20-3CA0	1	1 unit
			Green	1	0	B	3SU1130-0AB40-3BA0	1	1 unit

Illuminated pushbuttons with flat button, momentary contact with integrated LED									
	24	24	Red	0	1	B	3SU1132-0AB20-3CA0	1	1 unit
			Yellow	1	0	B	3SU1132-0AB30-3BA0	1	1 unit
			Green	1	0	B	3SU1132-0AB40-3BA0	1	1 unit
			Blue	1	0	▶	3SU1132-0AB50-3BA0	1	1 unit
			White	1	0	B	3SU1132-0AB60-3BA0	1	1 unit
			Clear	1	0	B	3SU1132-0AB70-3BA0	1	1 unit

• Revised •
07/15/16

Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

Mushroom pushbuttons /
EMERGENCY STOP mushroom pushbuttons

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Selection and ordering data

Unlatching method	Number of NO contacts	Number of NC contacts	DT	Screw terminals	PU (UNIT, SET, M)	PS*
				Order No.		

Mushroom pushbuttons

With red mushroom, diameter 40 mm, latching



3SU1130-1BA20-1CA0

Pull to unlatch	0	1	▶	3SU1130-1BA20-1CA0	1	1 unit
-----------------	---	---	---	--------------------	---	--------

Selection and ordering data

Unlatching method	Number of NO contacts	Number of NC contacts	Marking	DT	Screw terminals	PU (UNIT, SET, M)	PS*
					Order No.		

EMERGENCY STOP mushroom pushbuttons, tamper-proof, in accordance with ISO 13850 and IEC 60947-5-5

With red mushroom, diameter 40 mm, with positive latching



3SU1100-1HA20-1CH0

Pull to unlatch	0	1	NOT-HALT	B	3SU1100-1HA20-1CH0	1	1 unit
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3SU1100-1HB20-1CG0

Rotate to unlatch	0	1	None	B	3SU1100-1HB20-1CF0	1	1 unit
	0	1	EMERGENCY STOP	B	3SU1100-1HB20-1CG0	1	1 unit
	1	1	EMERGENCY STOP	B	3SU1100-1HB20-1FG0	1	1 unit



3SU1100-1HB20-3CH0

					Spring-type terminals		
Rotate to unlatch	0	1	NOT-HALT	B	3SU1100-1HB20-3CH0	1	1 unit











Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

• Revised •
08/31/15

Coordinate switches, complete

Selection and ordering data

	Operating principle	Color	Number of NO contacts	Number of NC contacts	DT	Screw terminals		PU (UNIT, SET, M)	PS*
						Order No.			
Selector switches									
	Short black actuator, 2 switch positions, can be illuminated								
	Latching, 90°	White	1	0	▶	3SU1130-2BF60-1BA0		1	1 unit
			1	1	▶	3SU1130-2BF60-1MA0		1	1 unit
	Short black actuator, 3 switch positions, can be illuminated								
3SU1130-2BF60-1BA0	Momentary contact, 2x45°		2	0	▶	3SU1130-2BM60-1NA0		1	1 unit
									
	Latching, 2x45°		2	0	▶	3SU1130-2BL60-1NA0		1	1 unit
									
	Short black actuator, 2 switch positions, can be illuminated						Spring-type terminals		
	Latching, 90°	White	1	0	B	3SU1130-2BF60-3BA0		1	1 unit
			1	1	B	3SU1130-2BF60-3MA0		1	1 unit
	Short black actuator, 3 switch positions, can be illuminated								
3SU1130-2BL60-1NA0	Momentary contact, 2x45°	White	2	0	B	3SU1130-2BM60-3NA0		1	1 unit
									
	Latching, 2x45°		2	0	B	3SU1130-2BL60-3NA0		1	1 unit
									


• Revised •
08/31/15

Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

Coordinate switches, complete

Selection and ordering data

Operating principle	Switch position for key removal	Number of NO contacts	Number of NC contacts	DT	Screw terminals 	PU (UNIT, SET, M)	PS*
Order No.							

Key-operated switches with 2 keys

With Ronis lock, SB30, 2 switch positions (O+I)



3SU1130-4BF11-1BA0

Latching, 90°
(10:30/1:30 o'clock)



O+I

1

0

▶

3SU1130-4BF11-1BA0

1

1 unit

With Ronis lock, SB30, 3 switch positions (I+O+II)



3SU1130-4BL11-1NA0

Latching, 2x45°
(10:30/1:30 o'clock)



O+I

2

0

B

3SU1130-4BL11-1NA0

1

1 unit

With Ronis lock, SB30, 2 switch positions (O+I)

Latching, 90°
(10:30/1:30 o'clock)



O+I

1

0

B

Spring-type terminals

3SU1130-4BF11-3BA0

1

1 unit

Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Complete Units

• Revised •
08/31/15

Indicator Lights Complete Units

Selection and ordering data

Operational voltage at AC, rated value		at DC, rated value		Color of actuating element		of light source		DT	Screw terminals		PU (UNIT, SET, M)	PS*
V									Order No.			
Indicator lights												
With smooth lens and integrated LED												
	24	24	Red	Red	A	3SU1102-6AA20-1AA0			1	1 unit		
			Yellow	Yellow	A	3SU1102-6AA30-1AA0			1	1 unit		
			Green	Green	A	3SU1102-6AA40-1AA0			1	1 unit		
			Blue	Blue	A	3SU1102-6AA50-1AA0			1	1 unit		
			White	White	A	3SU1102-6AA60-1AA0			1	1 unit		
			Clear	White	A	3SU1102-6AA70-1AA0			1	1 unit		
3SU1102-6AA30-1AA0												
	110	--	Amber	Amber	B	3SU1103-6AA00-1AA0			1	1 unit		
			Red	Red	A	3SU1103-6AA20-1AA0			1	1 unit		
			Yellow	Yellow	A	3SU1103-6AA30-1AA0			1	1 unit		
			Green	Green	A	3SU1103-6AA40-1AA0			1	1 unit		
			Blue	Blue	B	3SU1103-6AA50-1AA0			1	1 unit		
			White	White	A	3SU1103-6AA60-1AA0			1	1 unit		
			Clear	White	B	3SU1103-6AA70-1AA0			1	1 unit		
			3SU1103-6AA00-1AA0									
	230	--	Amber	Amber	B	3SU1106-6AA00-1AA0			1	1 unit		
			Red	Red	A	3SU1106-6AA20-1AA0			1	1 unit		
			Yellow	Yellow	A	3SU1106-6AA30-1AA0			1	1 unit		
			Green	Green	A	3SU1106-6AA40-1AA0			1	1 unit		
			Blue	Blue	B	3SU1106-6AA50-1AA0			1	1 unit		
			White	White	A	3SU1106-6AA60-1AA0			1	1 unit		
			Clear	White	B	3SU1106-6AA70-1AA0			1	1 unit		
			3SU1106-6AA50-1AA0									
Spring-type terminals 												
	24	24	Red	Red	B	3SU1102-6AA20-3AA0			1	1 unit		
			Yellow	Yellow	B	3SU1102-6AA30-3AA0			1	1 unit		
			Green	Green	B	3SU1102-6AA40-3AA0			1	1 unit		
			Blue	Blue	B	3SU1102-6AA50-3AA0			1	1 unit		
			White	White	B	3SU1102-6AA60-3AA0			1	1 unit		
			Clear	White	B	3SU1102-6AA70-3AA0			1	1 unit		
3SU1102-6AA20-3AA0												
	110	--	Red	Red	B	3SU1103-6AA20-3AA0			1	1 unit		
			Yellow	Yellow	B	3SU1103-6AA30-3AA0			1	1 unit		
			Green	Green	B	3SU1103-6AA40-3AA0			1	1 unit		
			Blue	Blue	B	3SU1103-6AA50-3AA0			1	1 unit		
			White	White	B	3SU1103-6AA60-3AA0			1	1 unit		
			Clear	White	B	3SU1103-6AA70-3AA0			1	1 unit		
3SU1102-6AA40-3AA0												
	230	--	Red	Red	B	3SU1106-6AA20-3AA0			1	1 unit		
			Yellow	Yellow	B	3SU1106-6AA30-3AA0			1	1 unit		
			Green	Green	B	3SU1106-6AA40-3AA0			1	1 unit		
			Blue	Blue	B	3SU1106-6AA50-3AA0			1	1 unit		
			White	White	B	3SU1106-6AA60-3AA0			1	1 unit		
			Clear	White	B	3SU1106-6AA70-3AA0			1	1 unit		
3SU1106-6AA60-3AA0												

• Revised •
07/15/16

Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Compact Units

Sensor switches / potentiometers

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Selection and ordering data

Operating principle	Number of NO contacts	Number of NC contacts	Color	DT	M12 connector, 4-pole	PU (UNIT, SET, M)	PS*
					Order No.		

Sensor switches



3SU1200-1SK10-2SA0

Whether integrated in the two-hand operation console or installed as a door opening contact, the capacitive sensor switch is suitable for many different applications in industrial environments.

The switch is actuated by simple contact with the hand or other part of the body (i.e. without the application of pressure). As a result, these switches are rugged, extremely durable and have the highest degree of protection IP66, IP67, IP69 (IP69K).

Without pressure	1	0	Black	A	3SU1200-1SK10-2SA0	1	1 unit
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For optional accessories, see

"Protection for sensor switches" on page 13/122.

"Connectors for sensor switches, angled socket with screw terminal connection" on page 13/128.

Selection and ordering data

Version of actuating element	Operating principle	Adjustable resistance	DT	Screw terminals	PU (UNIT, SET, M)	PS*
					Order No.	

Potentiometers



3SU1200-2PQ10-1AA0

Rotary knob	Stepless	1	B	3SU1200-2PQ10-1AA0	1	1 unit
		4.7	B	3SU1200-2PR10-1AA0	1	1 unit
		10	B	3SU1200-2PS10-1AA0	1	1 unit
		47	B	3SU1200-2PT10-1AA0	1	1 unit
		100	B	3SU1200-2PU10-1AA0	1	1 unit
		470	B	3SU1200-2PV10-1AA0	1	1 unit

Labeling plates for potentiometers



3SU1900-0BG16-0RU0

Black/White (label/lettering)	None	40	--	▶	3SU1900-0BG16-0AA0	1	10 units
			SYMBOL: 0 ... 9	B	3SU1900-0BG16-0RT0	1	10 units
			SYMBOL: Power up	B	3SU1900-0BG16-0RU0	1	10 units




Push Button Units and Indicator Lights


3SU1 22 mm, Plastic with Metal Front Ring, Matte — Compact Units

• Revised •
07/15/16

Sensor switches /
Pushbuttons with extended stroke

Selection and ordering data

Version	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Pushbuttons with extended stroke					
 3SU1230-0EB40-0AA0	Pushbuttons with flat button	Red	3SU1230-0EB20-0AA0	1	1 unit
		Green	3SU1230-0EB40-0AA0	1	1 unit
 3SU1230-0FB10-0AA0	Pushbuttons with raised button	Black	3SU1230-0FB10-0AA0	1	1 unit
 3SU1231-0EB20-0AA0	Pushbuttons with flat transparent button for insertion of insert labels	Red	3SU1231-0EB20-0AA0	1	1 unit
		Clear	3SU1231-0EB70-0AA0	1	1 unit

Version	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Accessories						
 3SU1900-0KG10-0AA0	Extension plungers For compensation of the distance between the pushbutton and the unlatching button of an overload relay	Plastic	Gray	3SU1900-0KG10-0AA0	1	1 unit

• Revised •
08/31/15

Push Button Units and Indicator Lights

Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

Pushbuttons

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Selection and ordering data




	Version of actuating element Front ring version	Operating principle Unlatching method	Color, marking	DT	Order No.	PU (UNIT, SET, M)	PS*
Pushbuttons							
 3SU1030-0AB50-0AR0	Pushbuttons with flat button Standard	Momentary contact	Black	▶	3SU1030-0AB10-0AA0	1	1 unit
			Black, O	B	3SU1030-0AB10-0AD0	1	1 unit
			Red	▶	3SU1030-0AB20-0AA0	1	1 unit
			Red, O	B	3SU1030-0AB20-0AD0	1	1 unit
			Red, AUTO	B	3SU1030-0AB20-0AQ0	1	1 unit
			Yellow	▶	3SU1030-0AB30-0AA0	1	1 unit
			Green	▶	3SU1030-0AB40-0AA0	1	1 unit
			Green, I	B	3SU1030-0AB40-0AC0	1	1 unit
			Blue	▶	3SU1030-0AB50-0AA0	1	1 unit
			Blue, R	B	3SU1030-0AB50-0AR0	1	1 unit
			White	▶	3SU1030-0AB60-0AA0	1	1 unit
			White, I	B	3SU1030-0AB60-0AC0	1	1 unit
			Clear	▶	3SU1030-0AB70-0AA0	1	1 unit
			Gray	B	3SU1030-0AB80-0AA0	1	1 unit
			 3SU1030-0AA40-0AA0		Latching	Black	▶
Push to unlatch	Red	B			3SU1030-0AA20-0AA0	1	1 unit
	Yellow	B			3SU1030-0AA30-0AA0	1	1 unit
	Green	B			3SU1030-0AA40-0AA0	1	1 unit
	Blue	▶			3SU1030-0AA50-0AA0	1	1 unit
	White	B			3SU1030-0AA60-0AA0	1	1 unit
	 3SU1030-0BB20-0AA0	Pushbuttons with raised button Standard			Momentary contact	Black	▶
Red			▶	3SU1030-0BB20-0AA0		1	1 unit
Yellow			B	3SU1030-0BB30-0AA0		1	1 unit
Green			B	3SU1030-0BB40-0AA0		1	1 unit
Blue			B	3SU1030-0BB50-0AA0		1	1 unit
White			B	3SU1030-0BB60-0AA0		1	1 unit
 3SU1030-0CB30-0AA0	Pushbuttons with flat button Raised	Momentary contact	Black	B	3SU1030-0CB10-0AA0	1	1 unit
			Red	B	3SU1030-0CB20-0AA0	1	1 unit
			Yellow	B	3SU1030-0CB30-0AA0	1	1 unit
			Green	B	3SU1030-0CB40-0AA0	1	1 unit
			Blue	B	3SU1030-0CB50-0AA0	1	1 unit
			White	B	3SU1030-0CB60-0AA0	1	1 unit

Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Sig

• Revised •
08/31/15

Pushbuttons

Version of actuating element Front ring version	Operating principle Unlatching method	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Pushbuttons						
	Illuminated pushbuttons with flat button Standard	Momentary contact	Amber Red Yellow Green Blue White Clear	▶ 3SU1031-0AB00-0AA0	1	1 unit
				▶ 3SU1031-0AB20-0AA0	1	1 unit
				▶ 3SU1031-0AB30-0AA0	1	1 unit
				▶ 3SU1031-0AB40-0AA0	1	1 unit
				▶ 3SU1031-0AB50-0AA0	1	1 unit
				▶ 3SU1031-0AB60-0AA0	1	1 unit
				▶ 3SU1031-0AB70-0AA0	1	1 unit
	Illuminated pushbuttons with flat button Standard	Momentary contact	Red Yellow Green Blue White Clear	▶ 3SU1031-0AA20-0AA0	1	1 unit
				▶ 3SU1031-0AA30-0AA0	1	1 unit
				▶ 3SU1031-0AA40-0AA0	1	1 unit
				▶ 3SU1031-0AA50-0AA0	1	1 unit
				▶ 3SU1031-0AA60-0AA0	1	1 unit
				▶ 3SU1031-0AA70-0AA0	1	1 unit
	Illuminated pushbuttons with raised button Standard	Momentary contact	Red Yellow Green Blue Clear	▶ 3SU1031-0BB20-0AA0	1	1 unit
				▶ 3SU1031-0BB30-0AA0	1	1 unit
				▶ 3SU1031-0BB40-0AA0	1	1 unit
				▶ 3SU1031-0BB50-0AA0	1	1 unit
				▶ 3SU1031-0BB70-0AA0	1	1 unit




• Revised •
07/15/16

Push Button Units and Indicator Lights

Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

Twin pushbuttons

Selection and ordering data

	Version of actuating element	Operating principle	Color	Marking	DT	Order No.	PU (UNIT, SET, M)	PS*
Twin pushbuttons								
	Twin pushbuttons flat, flat	Momentary contact	Green / Red	-- I / O	B ▶	3SU1030-3AB42-0AA0 3SU1030-3AB42-0AK0	1 1	1 unit 1 unit
			White / Black	-- I / O	B B	3SU1030-3AB61-0AA0 3SU1030-3AB61-0AK0	1 1	1 unit 1 unit
			White / White	-- Arrows, vert.	B B	3SU1030-3AB66-0AA0 3SU1030-3AB66-0AN0	1 1	1 unit 1 unit
			Black / Black	-- ○ ○	B B	3SU1030-3AB11-0AA0 3SU1030-3AB11-0AQ0	1 1	1 unit 1 unit
				5264 / 5265 (IEC 60417)				
	Twin pushbuttons flat, raised	Momentary contact	Green / Red	-- I / O	B ▶	3SU1030-3BB42-0AA0 3SU1030-3BB42-0AK0	1 1	1 unit 1 unit
	Twin pushbuttons flat, flat, illuminated	Momentary contact	Green / Red	-- I / O Arrows, vert.	B ▶ B	3SU1031-3AB42-0AA0 3SU1031-3AB42-0AK0 3SU1031-3AB42-0AN0	1 1 1	1 unit 1 unit 1 unit
			White / Black	-- I / O	B ▶	3SU1031-3AB61-0AA0 3SU1031-3AB61-0AK0	1 1	1 unit 1 unit
			White / White	-- Arrows, vert.	B B	3SU1031-3AB66-0AA0 3SU1031-3AB66-0AN0	1 1	1 unit 1 unit
	Twin pushbuttons flat, raised, illuminated	Momentary contact	Green / Red	-- I / O	B ▶	3SU1031-3BB42-0AA0 3SU1031-3BB42-0AK0	1 1	1 unit 1 unit
			White / Black	-- I / O	B B	3SU1031-3BB61-0AA0 3SU1031-3BB61-0AK0	1 1	1 unit 1 unit






Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Sig

• Revised •
08/31/15

Mushroom pushbuttons

Selection and ordering data

	Version of actuating element	Operating principle Unlatching method	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Mushroom pushbuttons							
	Mushroom pushbuttons 30 mm diameter, 2 positions	Momentary contact	Black	▶	3SU1030-1AD10-0AA0	1	1 unit
			Red	▶	3SU1030-1AD20-0AA0	1	1 unit
			Yellow	B	3SU1030-1AD30-0AA0	1	1 unit
			Green	▶	3SU1030-1AD40-0AA0	1	1 unit
		Latching Pull to unlatch	Black	▶	3SU1030-1AA10-0AA0	1	1 unit
			Red	▶	3SU1030-1AA20-0AA0	1	1 unit
	Mushroom pushbuttons 40 mm diameter, 2 positions	Momentary contact	Black	▶	3SU1030-1BD10-0AA0	1	1 unit
			Red	▶	3SU1030-1BD20-0AA0	1	1 unit
			Yellow	▶	3SU1030-1BD30-0AA0	1	1 unit
			Green	▶	3SU1030-1BD40-0AA0	1	1 unit
		Latching Pull to unlatch	Black	▶	3SU1030-1BA10-0AA0	1	1 unit
			Red	▶	3SU1030-1BA20-0AA0	1	1 unit
			Red, O	B	3SU1030-1BA20-0AD0	1	1 unit
	Mushroom pushbuttons 30 mm diameter, 2 positions, illuminated	Momentary contact	Yellow	B	3SU1031-1AD30-0AA0	1	1 unit
			Green	▶	3SU1031-1AD40-0AA0	1	1 unit
			White	▶	3SU1031-1AD60-0AA0	1	1 unit
			Clear	B	3SU1031-1AD70-0AA0	1	1 unit
		Latching Pull to unlatch	Red	▶	3SU1031-1AA20-0AA0	1	1 unit
			Yellow	B	3SU1031-1AA30-0AA0	1	1 unit
	Mushroom pushbuttons 40 mm diameter, 2 positions, illuminated	Momentary contact	Yellow	▶	3SU1031-1BD30-0AA0	1	1 unit
			Green	▶	3SU1031-1BD40-0AA0	1	1 unit
			White	B	3SU1031-1BD60-0AA0	1	1 unit
			Clear	B	3SU1031-1BD70-0AA0	1	1 unit
		Latching Pull to unlatch	Red	▶	3SU1031-1BA20-0AA0	1	1 unit
			Yellow	B	3SU1031-1BA30-0AA0	1	1 unit
	Mushroom pushbuttons with raised mushroom, 40 mm diameter, 2 positions	With positive latching, tamper-proof Rotate to unlatch	Black	A	3SU1000-1HB10-0AA0	1	1 unit
			Blue	B	3SU1000-1HB50-0AA0	1	1 unit






• Revised •
08/31/15

Push Button Units and Indicator Lights

Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

EMERGENCY STOP Mushroom pushbuttons

Selection and ordering data





Version of actuating element	Outer diameter of mushroom mm	Make of lock	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
EMERGENCY STOP mushroom pushbuttons							
With pull-to-unlatch mechanism							
 3SU1000-1HA20-0AA0	Tamper-proof, 2 positions 40	--	Red	A	3SU1000-1HA20-0AA0	1	1 unit
With rotate-to-unlatch mechanism							
 3SU1000-1GB20-0AA0	Tamper-proof, 2 positions 33.8	--	Red	A	3SU1000-1GB20-0AA0	1	1 unit
 3SU1000-1HB20-0AA0	40	--	Red	A	3SU1000-1HB20-0AA0	1	1 unit
 3SU1000-1JB20-0AA0	60	--	Red	▶	3SU1000-1JB20-0AA0	1	1 unit
With rotate-to-unlatch mechanism, can be illuminated							
 3SU1001-1HB20-0AA0	Tamper-proof, 2 positions	--	Red	B	3SU1001-1GB20-0AA0	1	1 unit
	40	--	Red	A	3SU1001-1HB20-0AA0	1	1 unit
	60	--	Red	B	3SU1001-1JB20-0AA0	1	1 unit

Push Button Units and Indicator Lights


3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Signal

• Revised •
07/15/16

EMERGENCY STOP mushroom pushbuttons / toggle switches

Version of actuating element	Outer diameter of mushroom mm	Make of lock	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
EMERGENCY STOP mushroom pushbuttons							
With key-operated release							
Tamper-proof, 2 positions	40	RONIS SB30	Red	A	3SU1000-1HF20-0AA0	1	1 unit
		RONIS 455	Red	B	3SU1000-1HG20-0AA0	1	1 unit
		BKS S1	Red	A	3SU1000-1HK20-0AA0	1	1 unit
		O.M.R. 73037	Red	A	3SU1000-1HQ20-0AA0	1	1 unit
		CES SSG10	Red	A	3SU1000-1HR20-0AA0	1	1 unit
		CES SSP9	Red	A	3SU1000-1HS20-0AA0	1	1 unit
		CES SMS1	Red	B	3SU1000-1HT20-0AA0	1	1 unit

Selection and ordering data

Number of switching positions	Number of command points	Color of actuating element	Operating principle of actuating element	DT	Order No.	PU (UNIT, SET, M)	PS*
Toggle switches							
	2	Black	Latching	B	3SU1030-3EA10-0AA0	1	1 unit
			Momentary contact Reset from above	B	3SU1030-3EC10-0AA0	1	1 unit

• Revised •
07/15/16

Push Button Units and Indicator Lights

Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

Selector switches

Selection and ordering data

Version of actuator	Operating principle	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Selector switches						
2 switch positions, can be illuminated						
	Selector, short black actuator	Momentary contact, 45° (10:30/12 o'clock), reset from center to left 	Black	B	3SU1032-2BC10-0AA0	1 1 unit
			Red	B	3SU1032-2BC20-0AA0	1 1 unit
			Yellow	B	3SU1032-2BC30-0AA0	1 1 unit
			Green	B	3SU1032-2BC40-0AA0	1 1 unit
			Blue	B	3SU1032-2BC50-0AA0	1 1 unit
			White	►	3SU1032-2BC60-0AA0	1 1 unit
	Selector, short black actuator	Latching, 90° (10:30/1:30 o'clock) 	Black	B	3SU1032-2BF10-0AA0	1 1 unit
			Red	►	3SU1032-2BF20-0AA0	1 1 unit
			Yellow	B	3SU1032-2BF30-0AA0	1 1 unit
			Green	A	3SU1032-2BF40-0AA0	1 1 unit
			Blue	B	3SU1032-2BF50-0AA0	1 1 unit
			White	►	3SU1032-2BF60-0AA0	1 1 unit
	Selector, long black actuator	Latching, 90° (10:30/1:30 o'clock) 	Black	B	3SU1032-2CF10-0AA0	1 1 unit
			Red	B	3SU1032-2CF20-0AA0	1 1 unit
			White	B	3SU1032-2CF60-0AA0	1 1 unit
	Rotary knob	Latching, 90° (10:30/1:30 o'clock) 	Red	B	3SU1032-2AF20-0AA0	1 1 unit
			White	B	3SU1032-2AF60-0AA0	1 1 unit

Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Sig

• Revised •
07/15/16

Selector switches

Version of actuator	Operating principle	Color	DT	Order No.	PU (UNIT, SET, M)	PS*		
Selector switches								
	Selector, short black actuator	Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right + left		Black	B	3SU1032-2BM10-0AA0	1	1 unit
				Red	B	3SU1032-2BM20-0AA0	1	1 unit
				Yellow	B	3SU1032-2BM30-0AA0	1	1 unit
				Green	B	3SU1032-2BM40-0AA0	1	1 unit
				Blue	B	3SU1032-2BM50-0AA0	1	1 unit
				White	▶	3SU1032-2BM60-0AA0	1	1 unit
	Latching, 2x45° (10:30/12/1:30 o'clock)			Black	B	3SU1032-2BL10-0AA0	1	1 unit
				Red	B	3SU1032-2BL20-0AA0	1	1 unit
				Yellow	B	3SU1032-2BL30-0AA0	1	1 unit
				Green	A	3SU1032-2BL40-0AA0	1	1 unit
				Blue	B	3SU1032-2BL50-0AA0	1	1 unit
				White	▶	3SU1032-2BL60-0AA0	1	1 unit
	Momentary contact/latching, 2x45° (10:30/12/1:30 o'clock), reset from left, latching to right			Black	B	3SU1032-2BP10-0AA0	1	1 unit
				Red	B	3SU1032-2BP20-0AA0	1	1 unit
				Yellow	B	3SU1032-2BP30-0AA0	1	1 unit
				Green	B	3SU1032-2BP40-0AA0	1	1 unit
				Blue	B	3SU1032-2BP50-0AA0	1	1 unit
				White	▶	3SU1032-2BP60-0AA0	1	1 unit
	Latching/momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right, latching to left			Black	B	3SU1032-2BN10-0AA0	1	1 unit
				Red	B	3SU1032-2BN20-0AA0	1	1 unit
				Yellow	B	3SU1032-2BN30-0AA0	1	1 unit
				Green	B	3SU1032-2BN40-0AA0	1	1 unit
				Blue	B	3SU1032-2BN50-0AA0	1	1 unit
				White	▶	3SU1032-2BN60-0AA0	1	1 unit
	Rotary knob	Latching, 4x90° (0-position: 3/6/9/12 o'clock)		White	B	3SU1030-2AS60-0AA0	1	1 unit

3SU1032-2BM60-0AA0

3SU1032-2BL20-0AA0

3SU1032-2BP40-0AA0

3SU1032-2BN30-0AA0

3SU1030-2AS60-0AA0

• Revised •
07/15/16








Push Button Units and Indicator Lights

Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

Key-operated switches

1
2
3
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Selection and ordering data











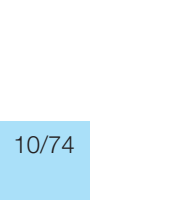

Operating principle	Make of lock	Switch position for key removal	Number of keys	DT	Order No.	PU (UNIT, SET, M)	PS*
Key-operated switches							
2 switch positions (O+I)							
 3SU1030-4BC01-0AA0	Momentary contact, 45° (10:30/12 o'clock), reset from center to left 	RONIS, SB30	O	2	▶	3SU1030-4BC01-0AA0	1 1 unit
		RONIS, 455	O	2	B	3SU1030-4CC01-0AA0	1 1 unit
		O.M.R. 73037, red	O	2	B	3SU1030-4FC01-0AA0	1 1 unit
		O.M.R. 73038, light blue	O	2	B	3SU1030-4GC01-0AA0	1 1 unit
		O.M.R. 73034, black	O	2	B	3SU1030-4HC01-0AA0	1 1 unit
		O.M.R. 73033, yellow	O	2	B	3SU1030-4JC01-0AA0	1 1 unit
		CES, SSG10	O	2	▶	3SU1030-5BC01-0AA0	1 1 unit
 3SU1030-4BF01-0AA0	Latching, 90° (10:30/1:30 o'clock) 	CES, LSG1	O	2	B	3SU1030-5HC01-0AA0	1 1 unit
		BKS, S1	O	2	A	3SU1030-5PC01-0AA0	1 1 unit
		IKON, 360012K1	O	2	B	3SU1030-5XC01-0AA0	1 1 unit
		RONIS, SB30	O	2	▶	3SU1030-4BF01-0AA0	1 1 unit
			O+I	2	▶	3SU1030-4BF11-0AA0	1 1 unit
			I	2	B	3SU1030-4BF21-0AA0	1 1 unit
		RONIS, 455	O	2	B	3SU1030-4CF01-0AA0	1 1 unit
 3SU1030-4FF01-0AA0			O+I	2	B	3SU1030-4CF11-0AA0	1 1 unit
		O.M.R. 73037, red	O	2	B	3SU1030-4FF01-0AA0	1 1 unit
			O+I	2	B	3SU1030-4FF11-0AA0	1 1 unit
		O.M.R. 73038, light blue	O	2	▶	3SU1030-4GF01-0AA0	1 1 unit
			O+I	2	B	3SU1030-4GF11-0AA0	1 1 unit
		O.M.R. 73034, black	O	2	B	3SU1030-4HF01-0AA0	1 1 unit
			O+I	2	B	3SU1030-4HF11-0AA0	1 1 unit
 3SU1030-5BF01-0AA0			I	2	B	3SU1030-4HF21-0AA0	1 1 unit
		O.M.R. 73033, yellow	O	2	B	3SU1030-4JF01-0AA0	1 1 unit
			O+I	2	B	3SU1030-4JF11-0AA0	1 1 unit
		CES, SSG10	O	2	▶	3SU1030-5BF01-0AA0	1 1 unit
			O+I	2	▶	3SU1030-5BF11-0AA0	1 1 unit
			I	2	B	3SU1030-5BF21-0AA0	1 1 unit
		CES, LSG1	O	2	B	3SU1030-5HF01-0AA0	1 1 unit
 3SU1030-5PF01-0AA0			O+I	2	B	3SU1030-5HF11-0AA0	1 1 unit
		BKS, S1	O	2	B	3SU1030-5PF01-0AA0	1 1 unit
			O+II	2	B	3SU1030-5PF11-0AA0	1 1 unit
			I	2	B	3SU1030-5PF21-0AA0	1 1 unit
		IKON, 360012K1	O	2	A	3SU1030-5XF01-0AA0	1 1 unit
			O+I	2	B	3SU1030-5XF11-0AA0	1 1 unit

Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Sig

• Revised •
07/15/16

Key-operated switches

Operating principle	Make of lock	Switch position for key removal	Number of keys	DT	Order No.	PU (UNIT, SET, M)	PS*
Key-operated switches							
3 switch positions (I+O+II)							
 3SU1030-4BM01-0AA0  3SU1030-4JL11-0AA0  3SU1030-5BL41-0AA0  3SU1030-5PL01-0AA0	Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from left + right	RONIS, SB30	O	2	▶	3SU1030-4BM01-0AA0	1 1 unit
		O.M.R. 73037, red	O	2	B	3SU1030-4FM01-0AA0	1 1 unit
		O.M.R. 73034, black	O	2	B	3SU1030-4HM01-0AA0	1 1 unit
		CES, SSG10	O	2	A	3SU1030-5BM01-0AA0	1 1 unit
		BKS, S1	O	2	B	3SU1030-5PM01-0AA0	1 1 unit
		IKON, 360012K1	O	2	B	3SU1030-5XM01-0AA0	1 1 unit
 3SU1030-4BL01-0AA0  3SU1030-4BL11-0AA0  3SU1030-4BL21-0AA0  3SU1030-4BL31-0AA0  3SU1030-4BL41-0AA0  3SU1030-4BL51-0AA0  3SU1030-4CL01-0AA0  3SU1030-4CL11-0AA0 3SU1030-4FL01-0AA0 3SU1030-4FL51-0AA0 3SU1030-4GL01-0AA0 3SU1030-4GL11-0AA0 3SU1030-4HL01-0AA0 3SU1030-4HL11-0AA0 3SU1030-4JL11-0AA0 3SU1030-5BL01-0AA0 3SU1030-5BL11-0AA0 3SU1030-5BL21-0AA0 3SU1030-5BL31-0AA0 3SU1030-5BL41-0AA0 3SU1030-5BL51-0AA0 3SU1030-5PL01-0AA0 3SU1030-5PL11-0AA0 3SU1030-5PL21-0AA0 3SU1030-5PL31-0AA0 3SU1030-5PL41-0AA0 3SU1030-5XL01-0AA0 3SU1030-5XL11-0AA0	Latching, 2x45° (10:30/12/1:30 o'clock)	RONIS, SB30	O	2	B	3SU1030-4BL01-0AA0	1 1 unit
		I+O+II	2	▶	B	3SU1030-4BL11-0AA0	1 1 unit
		I	2	B	B	3SU1030-4BL21-0AA0	1 1 unit
		II (right)	2	B	B	3SU1030-4BL31-0AA0	1 1 unit
		I+II	2	B	B	3SU1030-4BL41-0AA0	1 1 unit
		(left, right)	2	B	B	3SU1030-4BL51-0AA0	1 1 unit
		O+I (center, left)	2	B	B	3SU1030-4BL51-0AA0	1 1 unit
		RONIS, 455	O	2	B	3SU1030-4CL01-0AA0	1 1 unit
		I+O+II	2	B	B	3SU1030-4CL11-0AA0	1 1 unit
		O.M.R. 73037, red	O	2	B	3SU1030-4FL01-0AA0	1 1 unit
		O+I (center, left)	2	B	B	3SU1030-4FL51-0AA0	1 1 unit
		O.M.R. 73038, light blue	O	2	▶	3SU1030-4GL01-0AA0	1 1 unit
		I+O+II	2	B	B	3SU1030-4GL11-0AA0	1 1 unit
		O.M.R. 73034, black	O	2	B	3SU1030-4HL01-0AA0	1 1 unit
		I+O+II	2	B	B	3SU1030-4HL11-0AA0	1 1 unit
		O.M.R. 73033, yellow	I+O+II	2	B	3SU1030-4JL11-0AA0	1 1 unit
		CES, SSG10	O	2	B	3SU1030-5BL01-0AA0	1 1 unit
		I+O+II	2	A	A	3SU1030-5BL11-0AA0	1 1 unit
		I	2	B	B	3SU1030-5BL21-0AA0	1 1 unit
		II (right)	2	B	B	3SU1030-5BL31-0AA0	1 1 unit
		I+II	2	B	B	3SU1030-5BL41-0AA0	1 1 unit
		(left, right)	2	B	B	3SU1030-5BL51-0AA0	1 1 unit
		O+I (center, left)	2	B	B	3SU1030-5BL51-0AA0	1 1 unit
		BKS, S1	O	2	B	3SU1030-5PL01-0AA0	1 1 unit
		I+O+II	2	B	B	3SU1030-5PL11-0AA0	1 1 unit
		I	2	B	B	3SU1030-5PL21-0AA0	1 1 unit
		II (right)	2	B	B	3SU1030-5PL31-0AA0	1 1 unit
		I+II	2	B	B	3SU1030-5PL41-0AA0	1 1 unit
		(left, right)	2	B	B	3SU1030-5PL41-0AA0	1 1 unit
		IKON, 360012K1	O	2	B	3SU1030-5XL01-0AA0	1 1 unit
		I+O+II	2	B	B	3SU1030-5XL11-0AA0	1 1 unit

• Revised •
08/31/15

Push Button Units and Indicator Lights

Plastic with Metal Front Ring, Matte — Actuating and Signaling Elements

Key-operated switches /
ID key-operated switches

1
2
3
4
5
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8
9
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Operating principle	Make of lock	Switch position for key removal	Number of keys	DT	Order No.	PU (UNIT, SET, M)	PS*
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Key-operated switches

3 switch positions (I+O+II)



3SU1030-4BP01-0AA0

Momentary contact/latching, 2x45° (10:30/12/1:30 o'clock), reset from left, latching to the right



RONIS, SB30

O

2

B

3SU1030-4BP01-0AA0

1

1 unit

II (right)

2

B

3SU1030-4BP31-0AA0

1

1 unit

O + II

2

B

3SU1030-4BP61-0AA0

1

1 unit

(center, right)

CES, SSG10

O

2

B

3SU1030-5BP01-0AA0

1

1 unit

II (right)

2

B

3SU1030-5BP31-0AA0

1

1 unit

O + II

2

B

3SU1030-5BP61-0AA0

1

1 unit

(center, right)

BKS, S1

O

2

B

3SU1030-5PP01-0AA0

1

1 unit

Latching/momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right, latching to the left



RONIS, SB30

O

2

B

3SU1030-4BN01-0AA0

1

1 unit

I

2

B

3SU1030-4BN21-0AA0

1

1 unit

O+I

2

B

3SU1030-4BN51-0AA0

1

1 unit

(center, left)

O.M.R. 73038, light blue

O

2

B

3SU1030-4GN01-0AA0

1

1 unit

O.M.R. 73034, black

I

2

B

3SU1030-4HN21-0AA0

1

1 unit

CES, SSG10

O

2

B

3SU1030-5BN01-0AA0

1

1 unit

I

2

B

3SU1030-5BN21-0AA0

1

1 unit

O+I

2

B

3SU1030-5BN51-0AA0

1

1 unit

(center, left)



3SU1030-5BN01-0AA0

BKS, S1

O

2

B

3SU1030-5PN21-0AA0

1

1 unit

O+I

2

B

3SU1030-5PN51-0AA0

1

1 unit

(center, left)

IKON, 360012K1

O+I

2

B

3SU1030-5XN51-0AA0

1

1 unit

(center, left)

Selection and ordering data

Operating angle	Operating principle	Switch position for key removal	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
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ID key-operated switches

4 switch positions (O+I+II+III)



3SU1030-4WS10-0AA0

45

Latching

O+I+II+III

Black

X

3SU1030-4WS10-0AA0

1

1 unit

For available keys, see page 10/143

For electronic modules for ID key-operated switches, see page 10/109


Push Button Units and Indicator Lights

3SU1 22 mm, Plastic with Metal Front Ring, Matte — Actuating and Sig

• Revised •
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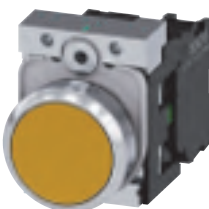




Indicator lights

Selection and ordering data

Version of actuating element		Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Indicator lights						
	Indicator lights with smooth lens	Amber	B	3SU1001-6AA00-0AA0	1	1 unit
		Red	A	3SU1001-6AA20-0AA0	1	1 unit
		Yellow	A	3SU1001-6AA30-0AA0	1	1 unit
		Green	A	3SU1001-6AA40-0AA0	1	1 unit
		Blue	A	3SU1001-6AA50-0AA0	1	1 unit
		White	A	3SU1001-6AA60-0AA0	1	1 unit
		Clear	A	3SU1001-6AA70-0AA0	1	1 unit

3SU1001-6AA20-0AA0

Selection and ordering data

Supply voltage for light source		Color	Number of NO contacts	Number of NC contacts	DT	Screw terminals		PU (UNIT, SET, M)	PS*
At AC	At DC								
V	V					Order No.			
Pushbuttons									
Pushbuttons with flat button, momentary contact									
	--	--	Black	1	0	▶	3SU1150-0AB10-1BA0	1	1 unit
				0	1		3SU1150-0AB10-1CA0	1	1 unit
			Red	1	0	B	3SU1150-0AB20-1BA0	1	1 unit
				0	1	▶	3SU1150-0AB20-1CA0	1	1 unit
			Yellow	1	0	▶	3SU1150-0AB30-1BA0	1	1 unit
			Green	1	0	▶	3SU1150-0AB40-1BA0	1	1 unit
			Blue	1	0	▶	3SU1150-0AB50-1BA0	1	1 unit
			White	1	0	▶	3SU1150-0AB60-1BA0	1	1 unit
Clear	1	0	B	3SU1150-0AB70-1BA0	1	1 unit			
Pushbuttons with raised button, momentary contact									
	--	--	Black	1	0	B	3SU1150-0BB10-1BA0	1	1 unit
				0	1	B	3SU1150-0BB10-1CA0	1	1 unit
			Red	0	1	B	3SU1150-0BB20-1CA0	1	1 unit
			Blue	1	0	B	3SU1150-0BB50-1BA0	1	1 unit
Illuminated pushbuttons with flat button, momentary contact, with integrated LED									
	24	24	Amber	1	0	▶	3SU1152-0AB00-1BA0	1	1 unit
			Red	0	1	▶	3SU1152-0AB20-1CA0	1	1 unit
			Yellow	1	0	▶	3SU1152-0AB30-1BA0	1	1 unit
			Green	1	0	▶	3SU1152-0AB40-1BA0	1	1 unit
			Blue	1	0	▶	3SU1152-0AB50-1BA0	1	1 unit
			White	1	0	A	3SU1152-0AB60-1BA0	1	1 unit
			Clear	1	0	▶	3SU1152-0AB70-1BA0	1	1 unit
	110	--	Amber	1	0	B	3SU1153-0AB00-1BA0	1	1 unit
			Red	0	1	B	3SU1153-0AB20-1CA0	1	1 unit
			Yellow	1	0	B	3SU1153-0AB30-1BA0	1	1 unit
			Green	1	0	B	3SU1153-0AB40-1BA0	1	1 unit
			Blue	1	0	B	3SU1153-0AB50-1BA0	1	1 unit
			White	1	0	B	3SU1153-0AB60-1BA0	1	1 unit
			Clear	1	0	B	3SU1153-0AB70-1BA0	1	1 unit
	230	--	Amber	1	0	B	3SU1156-0AB00-1BA0	1	1 unit
			Red	0	1	B	3SU1156-0AB20-1CA0	1	1 unit
			Yellow	1	0	B	3SU1156-0AB30-1BA0	1	1 unit
			Green	1	0	B	3SU1156-0AB40-1BA0	1	1 unit
			Blue	1	0	B	3SU1156-0AB50-1BA0	1	1 unit
			White	1	0	B	3SU1156-0AB60-1BA0	1	1 unit
			Clear	1	0	B	3SU1156-0AB70-1BA0	1	1 unit

Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Complete Units

• Revised •
08/31/15

Pushbuttons



3SU1150-0AB40-3BA0



3SU1150-0BB20-1CA0



3SU1152-0AB50-3BA0



3SU1153-0AB60-3BA0



3SU1156-0AB30-3BA0

Supply voltage for light source		Color	Number of NO contacts	Number of NC contacts	DT	Spring-type terminals	PU (UNIT, SET, M)	PS*
At AC	At DC							
V	V					Order No.		
Pushbuttons with flat button, momentary contact								
--	--	Black	1	0	▶	3SU1150-0AB10-3BA0	1	1 unit
			0	1	B	3SU1150-0AB10-3CA0	1	1 unit
		Red	0	1	B	3SU1150-0AB20-3CA0	1	1 unit
		Yellow	1	0	B	3SU1150-0AB30-3BA0	1	1 unit
		Green	1	0	B	3SU1150-0AB40-3BA0	1	1 unit
		Blue	1	0	B	3SU1150-0AB50-3BA0	1	1 unit
		White	1	0	B	3SU1150-0AB60-3BA0	1	1 unit
Pushbuttons with raised button, momentary contact								
--	--	Red	0	1	B	3SU1150-0BB20-3CA0	1	1 unit
Illuminated pushbuttons with flat button, momentary contact, with integrated LED								
24	24	Red	0	1	B	3SU1152-0AB20-3CA0	1	1 unit
		Yellow	1	0	B	3SU1152-0AB30-3BA0	1	1 unit
		Green	1	0	B	3SU1152-0AB40-3BA0	1	1 unit
		Blue	1	0	B	3SU1152-0AB50-3BA0	1	1 unit
		White	1	0	B	3SU1152-0AB60-3BA0	1	1 unit
		Clear	1	0	B	3SU1152-0AB70-3BA0	1	1 unit
110	--	Red	0	1	B	3SU1153-0AB20-3CA0	1	1 unit
		Yellow	1	0	B	3SU1153-0AB30-3BA0	1	1 unit
		Green	1	0	B	3SU1153-0AB40-3BA0	1	1 unit
		Blue	1	0	B	3SU1153-0AB50-3BA0	1	1 unit
		White	1	0	B	3SU1153-0AB60-3BA0	1	1 unit
		Clear	1	0	B	3SU1153-0AB70-3BA0	1	1 unit
230	--	Red	0	1	B	3SU1156-0AB20-3CA0	1	1 unit
		Yellow	1	0	B	3SU1156-0AB30-3BA0	1	1 unit
		Green	1	0	B	3SU1156-0AB40-3BA0	1	1 unit
		Blue	1	0	B	3SU1156-0AB50-3BA0	1	1 unit
		White	1	0	B	3SU1156-0AB60-3BA0	1	1 unit
		Clear	1	0	B	3SU1156-0AB70-3BA0	1	1 unit

• Revised •
08/31/15

Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Complete Units

Mushroom pushbuttons /
EMERGENCY STOP mushroom pushbuttons

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Selection and ordering data

Unlatching method	Number of NO contacts	Number of NC contacts	DT	Screw terminals	PU (UNIT, SET, M)	PS*
				Order No.		

Mushroom pushbuttons

With red mushroom, diameter 40 mm, latching



3SU1150-1BA20-1CA0

Pull to unlatch	0	1	▶	3SU1150-1BA20-1CA0	1	1 unit
				Spring-type terminals		
Pull to unlatch	0	1	B	3SU1150-1BA20-3CA0	1	1 unit

Selection and ordering data

Unlatching method	Number of NO contacts	Number of NC contacts	Marking	DT	Screw terminals	PU (UNIT, SET, M)	PS*
					Order No.		

EMERGENCY STOP mushroom pushbuttons, tamper-proof, in accordance with ISO 13850 and IEC 60947-5-5

With red mushroom, diameter 40 mm, with positive latching



3SU1150-1HA20-1CG0

Pull to unlatch	0	1	EMERGENCY STOP	▶	3SU1150-1HA20-1CG0	1	1 unit
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3SU1150-1HB20-1CG0

Rotate to unlatch	0	1	EMERGENCY STOP	▶	3SU1150-1HB20-1CG0	1	1 unit
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3SU1150-1HA20-3CH0

					Spring-type terminals		
Pull to unlatch	0	1	NOT-HALT	B	3SU1150-1HA20-3CH0	1	1 unit
	0	2	NOT-HALT	B	3SU1150-1HA20-3PH0	1	1 unit



3SU1150-1HB20-3CH0

Rotate to unlatch	0	1	NOT-HALT	B	3SU1150-1HB20-3CH0	1	1 unit
	0	2	NOT-HALT	B	3SU1150-1HB20-3PH0	1	1 unit












Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Complete Units





• Revised •
08/31/15

Selector switches / key-operated switches

Selection and ordering data

	Operating principle	Color	Number of NO contacts	Number of NC contacts	DT	Screw terminals	PU (UNIT, SET, M)	PS*
						Order No.		
Selector switches								
	Short black actuator, 2 switch positions (O+I)							
	Latching, 90°	White	1	0	▶	3SU1150-2BF60-1BA0	1	1 unit
			1	1	▶	3SU1150-2BF60-1MA0	1	1 unit
	Short black actuator, 3 switch positions (I+O+II)							
	Momentary contact, 2x45° reset from left + right	White	2	0	A	3SU1150-2BM60-1NA0	1	1 unit
								
	Latching, 2x45°	White	2	0	A	3SU1150-2BL60-1NA0	1	1 unit
								
						Spring-type terminals		
	Short black actuator, 2 switch positions (O+I)							
	Latching, 90°	White	1	0	▶	3SU1150-2BF60-3BA0	1	1 unit
			1	1	▶	3SU1150-2BF60-3MA0	1	1 unit
	Short black actuator, 3 switch positions (I +O+II)							
	Momentary contact, 2x45° reset from left + right	White	2	0	B	3SU1150-2BM60-3NA0	1	1 unit
								
	Latching, 2x45°	White	2	0	▶	3SU1150-2BL60-3NA0	1	1 unit
								

Selection and ordering data

	Operating principle	Switch position for key removal	Number of NO contacts	Number of NC contacts	DT	Screw terminals		PU (UNIT, SET, M)	PS*
						Order No.			
						Key-operated switches			
	With Ronis lock, SB30, 2 switch positions (O+I)								
	Latching, 90° (10:30/1:30 o'clock)	O+I	1	0	▶	3SU1150-4BF11-1BA0		1	1 unit
						Spring-type terminals			
		O+I	1	0	B	3SU1150-4BF11-3BA0		1	1 unit
		O	0	2	B	3SU1150-4BF01-3PA0		1	1 unit

3SU1150-4BF11-1BA0

• Revised •
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Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Complete Units

Indicator lights

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Selection and ordering data

Operational voltage		Color	Of actuating element	Of light source	DT	Screw terminals		PU (UNIT, SET, M)	PS*
At AC, rated value	At DC, rated value								
V	V					Order No.			
Indicator lights									
With smooth lens and integrated LED									
	24	24	Amber	Amber	B	3SU1152-6AA00-1AA0	1	1 unit	
			Red	Red	▶	3SU1152-6AA20-1AA0	1	1 unit	
			Yellow	Yellow	▶	3SU1152-6AA30-1AA0	1	1 unit	
			Green	Green	▶	3SU1152-6AA40-1AA0	1	1 unit	
			Blue	Blue	▶	3SU1152-6AA50-1AA0	1	1 unit	
			White	White	▶	3SU1152-6AA60-1AA0	1	1 unit	
			Clear	White	B	3SU1152-6AA70-1AA0	1	1 unit	
	110	--	Amber	Amber	B	3SU1153-6AA00-1AA0	1	1 unit	
			Red	Red	A	3SU1153-6AA20-1AA0	1	1 unit	
			Yellow	Yellow	B	3SU1153-6AA30-1AA0	1	1 unit	
			Green	Green	A	3SU1153-6AA40-1AA0	1	1 unit	
			Blue	Blue	B	3SU1153-6AA50-1AA0	1	1 unit	
			White	White	B	3SU1153-6AA60-1AA0	1	1 unit	
			Clear	White	B	3SU1153-6AA70-1AA0	1	1 unit	
	AC 230	--	Red	Red	A	3SU1156-6AA20-1AA0	1	1 unit	
			Yellow	Yellow	B	3SU1156-6AA30-1AA0	1	1 unit	
			Green	Green	A	3SU1156-6AA40-1AA0	1	1 unit	
			Blue	Blue	B	3SU1156-6AA50-1AA0	1	1 unit	
			White	White	B	3SU1156-6AA60-1AA0	1	1 unit	
			Clear	White	B	3SU1156-6AA70-1AA0	1	1 unit	
						Spring-type terminals			
	24	24	Red	Red	▶	3SU1152-6AA20-3AA0	1	1 unit	
			Yellow	Yellow	▶	3SU1152-6AA30-3AA0	1	1 unit	
			Green	Green	▶	3SU1152-6AA40-3AA0	1	1 unit	
			Blue	Blue	▶	3SU1152-6AA50-3AA0	1	1 unit	
			White	White	▶	3SU1152-6AA60-3AA0	1	1 unit	
			Clear	White	B	3SU1152-6AA70-3AA0	1	1 unit	
	110	--	Red	Red	B	3SU1153-6AA20-3AA0	1	1 unit	
			Yellow	Yellow	B	3SU1153-6AA30-3AA0	1	1 unit	
			Green	Green	B	3SU1153-6AA40-3AA0	1	1 unit	
			Blue	Blue	B	3SU1153-6AA50-3AA0	1	1 unit	
			White	White	B	3SU1153-6AA60-3AA0	1	1 unit	
			Clear	White	B	3SU1153-6AA70-3AA0	1	1 unit	
	230	--	Red	Red	B	3SU1156-6AA20-3AA0	1	1 unit	
			Yellow	Yellow	B	3SU1156-6AA30-3AA0	1	1 unit	
			Green	Green	B	3SU1156-6AA40-3AA0	1	1 unit	
			Blue	Blue	B	3SU1156-6AA50-3AA0	1	1 unit	
			White	White	B	3SU1156-6AA60-3AA0	1	1 unit	
			Clear	White	B	3SU1156-6AA70-3AA0	1	1 unit	



Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Compact Units

• Revised •
07/15/16

Potentiometers

Selection and ordering data

Version of actuating element		Operating principle	Adjustable resistance	DT	Screw terminals	PU (UNIT, SET, M)	PS*
					Order No.		
				kΩ			
Potentiometers							
	Rotary knob	Stepless	1	B	3SU1250-2PQ10-1AA0	1	1 unit
			4.7	B	3SU1250-2PR10-1AA0	1	1 unit
			10	B	3SU1250-2PS10-1AA0	1	1 unit
			47	B	3SU1250-2PT10-1AA0	1	1 unit
			100	B	3SU1250-2PU10-1AA0	1	1 unit
			470	B	3SU1250-2PV10-1AA0	1	1 unit
3SU1250-2PQ10-1AA0							
Labeling plates for potentiometers							
	Black/White (label/lettering)	None	40	--	▶ 3SU1900-0BG16-0AA0	1	10 units
				SYMBOL: 0 ... 9	B 3SU1900-0BG16-0RT0	1	10 units
				SYMBOL: Power up	B 3SU1900-0BG16-0RU0	1	10 units
3SU1900-0BG16-0RU0							




• Revised •
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Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Compact Units

Pushbuttons with extended stroke

Selection and ordering data

Version	Color	DT	Order No.	PU (UNIT, SET, M)	PS*		
Pushbuttons with extended stroke							
	Pushbuttons with flat button						
	Red	B	3SU1250-0EB20-0AA0	1	1 unit		
	Green	B	3SU1250-0EB40-0AA0	1	1 unit		
	Blue	B	3SU1250-0EB50-0AA0				
	Pushbuttons with raised button		Black	A	3SU1250-0FB10-0AA0	1	1 unit
	Illuminated pushbuttons with flat button		Red	B	3SU1251-0EB20-0AA0	1	1 unit
	Clear	B	3SU1251-0EB70-0AA0	1	1 unit		

Version	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*	
Accessories							
	Extension plungers	Plastic	Black	A	3SU1900-0KG10-0AA0	1	1 unit
	For compensation of the distance between the pushbutton and the unlatching button of an overload relay						

Push Button Units and Indicator Lights




3SU1 22 mm, Metal, Shiny — Compact Units

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Pushbuttons

Selection and ordering data

Version of actuating element Front ring version		Operating principle Unlatching method	Color, marking	DT	Order No.	PU (UNIT, SET, M)	PS*
Pushbuttons							
 3SU1050-0AB40-0AC0	Pushbuttons with flat button Standard	Momentary contact	Black	▶	3SU1050-0AB10-0AA0	1	1 unit
			Black, O	B	3SU1050-0AB10-0AD0	1	1 unit
			Red	▶	3SU1050-0AB20-0AA0	1	1 unit
			Red, O	B	3SU1050-0AB20-0AD0	1	1 unit
			Yellow	▶	3SU1050-0AB30-0AA0	1	1 unit
			Green	▶	3SU1050-0AB40-0AA0	1	1 unit
			Green, I	B	3SU1050-0AB40-0AC0	1	1 unit
			Blue	▶	3SU1050-0AB50-0AA0	1	1 unit
			Blue, R	B	3SU1050-0AB50-0AR0	1	1 unit
			White	▶	3SU1050-0AB60-0AA0	1	1 unit
			White, ⊕	B	3SU1050-0AB60-0AB0	1	1 unit
			White, I	B	3SU1050-0AB60-0AC0	1	1 unit
			Clear	▶	3SU1050-0AB70-0AA0	1	1 unit
			Gray	▶	3SU1050-0AB80-0AA0	1	1 unit
		Latching Push to unlatch	Black	▶	3SU1050-0AA10-0AA0	1	1 unit
			Red	▶	3SU1050-0AA20-0AA0	1	1 unit
			Yellow	▶	3SU1050-0AA30-0AA0	1	1 unit
			Green	▶	3SU1050-0AA40-0AA0	1	1 unit
			Blue	▶	3SU1050-0AA50-0AA0	1	1 unit
			White	▶	3SU1050-0AA60-0AA0	1	1 unit
 3SU1050-0BB20-0AA0	Pushbuttons with raised button Standard	Momentary contact	Black	▶	3SU1050-0BB10-0AA0	1	1 unit
			Red	▶	3SU1050-0BB20-0AA0	1	1 unit
			Yellow	▶	3SU1050-0BB30-0AA0	1	1 unit
			Green	▶	3SU1050-0BB40-0AA0	1	1 unit
			Blue	▶	3SU1050-0BB50-0AA0	1	1 unit
			White	▶	3SU1050-0BB60-0AA0	1	1 unit
		Latching Push to unlatch	Red	B	3SU1050-0BA20-0AA0	1	1 unit
 3SU1050-0CB50-0AA0	Pushbuttons with flat button Raised	Momentary contact	Black	▶	3SU1050-0CB10-0AA0	1	1 unit
			Red	B	3SU1050-0CB20-0AA0	1	1 unit
			Yellow	B	3SU1050-0CB30-0AA0	1	1 unit
			Green	B	3SU1050-0CB40-0AA0	1	1 unit
			Blue	▶	3SU1050-0CB50-0AA0	1	1 unit
			White	B	3SU1050-0CB60-0AA0	1	1 unit



• Revised •
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Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

Pushbuttons

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Version of actuating element Front ring version	Operating principle Unlatching method	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Pushbuttons						
 3SU1051-0AB30-0AA0	Illuminated pushbuttons with flat button Standard	Momentary contact	Amber	▶ 3SU1051-0AB00-0AA0	1	1 unit
			Red	▶ 3SU1051-0AB20-0AA0	1	1 unit
			Yellow	▶ 3SU1051-0AB30-0AA0	1	1 unit
			Green	▶ 3SU1051-0AB40-0AA0	1	1 unit
			Blue	▶ 3SU1051-0AB50-0AA0	1	1 unit
			White	▶ 3SU1051-0AB60-0AA0	1	1 unit
			Clear	▶ 3SU1051-0AB70-0AA0	1	1 unit
	Latching Push to unlatch	Red	▶	3SU1051-0AA20-0AA0	1	1 unit
			B	3SU1051-0AA30-0AA0	1	1 unit
			B	3SU1051-0AA40-0AA0	1	1 unit
 3SU1051-0AA20-0AA0	Illuminated pushbuttons with raised button Standard	Momentary contact	Amber	▶ 3SU1051-0BB00-0AA0	1	1 unit
			Red	▶ 3SU1051-0BB20-0AA0	1	1 unit
			Yellow	▶ 3SU1051-0BB30-0AA0	1	1 unit
			Green	▶ 3SU1051-0BB40-0AA0	1	1 unit
			Blue	▶ 3SU1051-0BB50-0AA0	1	1 unit
			White	▶ 3SU1051-0BB60-0AA0	1	1 unit
			Clear	▶ 3SU1051-0BB70-0AA0	1	1 unit
	Latching Push to unlatch	Red	▶	3SU1051-0AA20-0AA0	1	1 unit
			B	3SU1051-0AA30-0AA0	1	1 unit
			B	3SU1051-0AA40-0AA0	1	1 unit





Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

• Revised •
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Twin pushbuttons

Selection and ordering data

	Version of actuating element	Operating principle	Color	Marking	DT	Order No.	PU (UNIT, SET, M)	PS*			
Twin pushbuttons											
	Twin pushbuttons, flat, flat	Momentary contact	Green / Red	--	B	3SU1050-3AB42-0AA0	1	1 unit			
				I / O	▶	3SU1050-3AB42-0AK0	1	1 unit			
			White / Black	--	B	3SU1050-3AB61-0AA0	1	1 unit			
				I / O	B	3SU1050-3AB61-0AK0	1	1 unit			
			White / White	--	B	3SU1050-3AB66-0AA0	1	1 unit			
				- / +	B	3SU1050-3AB66-0AL0	1	1 unit			
				Arrows, hor.	B	3SU1050-3AB66-0AM0	1	1 unit			
			Black / Black	--	B	3SU1050-3AB11-0AA0	1	1 unit			
				○ ○	B	3SU1050-3AB11-0AQ0	1	1 unit			
			5264 / 5265 (IEC 60417)								
	Twin pushbuttons, flat, raised	Momentary contact	Green / Red	--	B	3SU1050-3BB42-0AA0	1	1 unit			
				I / O	▶	3SU1050-3BB42-0AK0	1	1 unit			
			White / Black	--	B	3SU1050-3BB61-0AA0	1	1 unit			
				I / O	B	3SU1050-3BB61-0AK0	1	1 unit			
	Twin pushbuttons, flat, flat, illuminated	Momentary contact	Green / Red	--	B	3SU1051-3AB42-0AA0	1	1 unit			
				I / O	▶	3SU1051-3AB42-0AK0	1	1 unit			
				Arrows, vert.	B	3SU1051-3AB42-0AN0	1	1 unit			
			White / Black	--	B	3SU1051-3AB61-0AA0	1	1 unit			
				I / O	▶	3SU1051-3AB61-0AK0	1	1 unit			
	Twin pushbuttons, flat, raised, illuminated	Momentary contact	Green / Red	--	B	3SU1051-3BB42-0AA0	1	1 unit			
				I / O	▶	3SU1051-3BB42-0AK0	1	1 unit			
			White / Black	--	B	3SU1051-3BB61-0AA0	1	1 unit			
				I / O	B	3SU1051-3BB61-0AK0	1	1 unit			

Selection and ordering data










Version of actuating element	Operating principle Unlatching method	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Mushroom pushbuttons						
2 switch positions						
 3SU1050-1AD20-0AA0	Momentary contact	Black	▶	3SU1050-1AD10-0AA0	1	1 unit
		Red	▶	3SU1050-1AD20-0AA0	1	1 unit
		Yellow	▶	3SU1050-1AD30-0AA0	1	1 unit
		Green	B	3SU1050-1AD40-0AA0	1	1 unit
	Latching Pull to unlatch	Black	B	3SU1050-1AA10-0AA0	1	1 unit
		Red	▶	3SU1050-1AA20-0AA0	1	1 unit
 3SU1050-1BD30-0AA0	Momentary contact	Black	▶	3SU1050-1BD10-0AA0	1	1 unit
		Red	▶	3SU1050-1BD20-0AA0	1	1 unit
		Yellow	▶	3SU1050-1BD30-0AA0	1	1 unit
		Green	B	3SU1050-1BD40-0AA0	1	1 unit
	Latching Pull to unlatch	Black	▶	3SU1050-1BA10-0AA0	1	1 unit
		Red	▶	3SU1050-1BA20-0AA0	1	1 unit
		Yellow	B	3SU1050-1BA30-0AA0	1	1 unit
 3SU1050-1CD40-0AA0	Momentary contact	Black	▶	3SU1050-1CD10-0AA0	1	1 unit
		Red	▶	3SU1050-1CD20-0AA0	1	1 unit
		Yellow	B	3SU1050-1CD30-0AA0	1	1 unit
		Green	B	3SU1050-1CD40-0AA0	1	1 unit
	Latching Pull to unlatch	Black	B	3SU1050-1CA10-0AA0	1	1 unit
		Red	B	3SU1050-1CA20-0AA0	1	1 unit
 3SU1051-1AD60-0AA0	Momentary contact	Yellow	B	3SU1051-1AD30-0AA0	1	1 unit
		Green	B	3SU1051-1AD40-0AA0	1	1 unit
		White	B	3SU1051-1AD60-0AA0	1	1 unit
	Latching Pull to unlatch	Amber	▶	3SU1051-1AA00-0AA0	1	1 unit
		Red	▶	3SU1051-1AA20-0AA0	1	1 unit
		Yellow	▶	3SU1051-1AA30-0AA0	1	1 unit
		Green	B	3SU1051-1AA40-0AA0	1	1 unit
		Blue	B	3SU1051-1AA50-0AA0	1	1 unit
		Clear	▶	3SU1051-1AA70-0AA0	1	1 unit
 3SU1051-1BD40-0AA0	Momentary contact	Amber	▶	3SU1051-1BD00-0AA0	1	1 unit
		Yellow	B	3SU1051-1BD30-0AA0	1	1 unit
		Green	B	3SU1051-1BD40-0AA0	1	1 unit
		White	B	3SU1051-1BD60-0AA0	1	1 unit
	Latching Pull to unlatch	Amber	B	3SU1051-1BA00-0AA0	1	1 unit
		Red	B	3SU1051-1BA20-0AA0	1	1 unit
		Yellow	B	3SU1051-1BA30-0AA0	1	1 unit
		Green	B	3SU1051-1BA40-0AA0	1	1 unit
		Blue	B	3SU1051-1BA50-0AA0	1	1 unit
		Clear	B	3SU1051-1BA70-0AA0	1	1 unit
 3SU1051-1CA50-0AA0	Momentary contact	Amber	B	3SU1051-1CD00-0AA0	1	1 unit
		Yellow	B	3SU1051-1CD30-0AA0	1	1 unit
		Green	B	3SU1051-1CD40-0AA0	1	1 unit
		White	B	3SU1051-1CD60-0AA0	1	1 unit
	Latching Pull to unlatch	Red	B	3SU1051-1CA20-0AA0	1	1 unit
		Yellow	B	3SU1051-1CA30-0AA0	1	1 unit
		Green	B	3SU1051-1CA40-0AA0	1	1 unit
		Blue	B	3SU1051-1CA50-0AA0	1	1 unit
		Clear	B	3SU1051-1CA70-0AA0	1	1 unit

Push Button Units and Indicator Lights



3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

• Revised •
08/31/15

Mushroom pushbuttons / EMERGENCY STOP mushroom pushbuttons

Version of actuating element	Operating principle Unlatching method	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Mushroom pushbuttons						
2 switch positions						
	Mushroom pushbuttons with raised mushroom, tamper-proof 40 mm diameter, 2 positions	Latching	Black	B	3SU1050-1HB10-0AA0	1 1 unit
		Rotate to unlatch				
3 switch positions						
	Mushroom pushbuttons 40 mm diameter, 3 positions	Momentary contact	Black	B	3SU1050-1ED10-0AA0	1 1 unit
			Red	B	3SU1050-1ED20-0AA0	1 1 unit
	Mushroom pushbuttons 40 mm diameter, 3 positions, illuminated	Latching	Black	B	3SU1050-1EA10-0AA0	1 1 unit
			Red	B	3SU1050-1EA20-0AA0	1 1 unit
		Pull to unlatch				
	EMERGENCY STOP mushroom pushbuttons tamper-proof, 2 positions	Momentary contact	Red	B	3SU1050-1HA20-0AA0	1 1 unit
			White	B	3SU1051-1ED60-0AA0	1 1 unit
	EMERGENCY STOP mushroom pushbuttons tamper-proof, 2 positions	Latching	Red	B	3SU1051-1EA20-0AA0	1 1 unit
			Green	B	3SU1051-1EA40-0AA0	1 1 unit
		Pull to unlatch				

Selection and ordering data

Version of actuating element	Outer diameter of mushroom	Make of lock	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
EMERGENCY STOP mushroom pushbuttons							
	With pull-to-unlatch mechanism						
	40	--	Red	▶	3SU1050-1HA20-0AA0	1	1 unit
EMERGENCY STOP mushroom pushbuttons tamper-proof, 2 positions							
	With rotate-to-unlatch mechanism						
	33.8	--	Red	▶	3SU1050-1GB20-0AA0	1	1 unit
EMERGENCY STOP mushroom pushbuttons tamper-proof, 2 positions							

• Revised •
07/15/16

Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

EMERGENCY STOP mushroom pushbuttons

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EMERGENCY STOP mushroom pushbuttons

Version of actuating element	Outer diameter of mushroom	Make of lock	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
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With rotate-to-unlatch mechanism

EMERGENCY STOP mushroom pushbuttons tamper-proof, 2 positions



3SU1050-1HB20-0AA0



3SU1050-1JB20-0AA0

40	--	Red	▶	3SU1050-1HB20-0AA0	1	1 unit
60	--	Red	▶	3SU1050-1JB20-0AA0	1	1 unit

With rotate-to-unlatch mechanism, can be illuminated

EMERGENCY STOP mushroom pushbuttons tamper-proof, 2 positions



3SU1051-1HB20-0AA0

33.8	--	Red	B	3SU1051-1GB20-0AA0	1	1 unit
40	--	Red	B	3SU1051-1HB20-0AA0	1	1 unit
60	--	Red	B	3SU1051-1JB20-0AA0	1	1 unit

With key-operated release

EMERGENCY STOP mushroom pushbuttons tamper-proof, 2 positions



3SU1050-1HF20-0AA0



3SU1050-1HQ20-0AA0



3SU1050-1HR20-0AA0

40	RONIS SB30 RONIS 455 RONIS 421	Red	▶ B B	3SU1050-1HF20-0AA0 3SU1050-1HG20-0AA0 3SU1050-1HH20-0AA0	1 1 1	1 unit 1 unit 1 unit
	BKS S1 O.M.R. 73037		B ▶	3SU1050-1HK20-0AA0 3SU1050-1HQ20-0AA0	1 1	1 unit 1 unit
	CES SSG10 CES SSP9 CES VL5	Black Red	▶ B B B B B	3SU1050-1HR20-0AA0 3SU1050-1HS20-0AA0 3SU1050-1HU10-0AA0 3SU1050-1HU20-0AA0 3SU1050-1HV20-0AA0 3SU1050-1HX20-0AA0	1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit


Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements








• Revised •
07/15/16

Toggle switches / Selector switches

Selection and ordering data

	Number of switching positions	Number of command points	Color of actuating element	Operating principle of the actuating element	DT	Order No.	PU (UNIT, SET, M)	PS*
Toggle switches								
	2	1	Black	Latching	B	3SU1050-3EA10-0AA0	1	1 unit
				Momentary contact Reset from above	B	3SU1050-3EC10-0AA0	1	1 unit

Selection and ordering data

	Version of actuator	Operating principle	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Selector switches							
2 switch positions, can be illuminated							
	Selector, short black actuator	Momentary contact, 45° (10:30/12 o'clock), reset from center to left 	Black	B	3SU1052-2BC10-0AA0	1	1 unit
			Red	B	3SU1052-2BC20-0AA0	1	1 unit
			Yellow	B	3SU1052-2BC30-0AA0	1	1 unit
			Green	B	3SU1052-2BC40-0AA0	1	1 unit
			Blue	B	3SU1052-2BC50-0AA0	1	1 unit
			White	B	3SU1052-2BC60-0AA0	1	1 unit
	Selector, long black actuator	Latching, 90° (10:30/1:30 o'clock) 	Amber	B	3SU1052-2BF00-0AA0	1	1 unit
			Black	B	3SU1052-2BF10-0AA0	1	1 unit
			Red	B	3SU1052-2BF20-0AA0	1	1 unit
			Green	B	3SU1052-2BF40-0AA0	1	1 unit
			White	►	3SU1052-2BF60-0AA0	1	1 unit
	Selector, long black actuator	Momentary contact, 45° (10:30/12 o'clock), reset from center to left 	Black	B	3SU1052-2CC10-0AA0	1	1 unit
			Yellow	B	3SU1052-2CC30-0AA0	1	1 unit
			Green	B	3SU1052-2CC40-0AA0	1	1 unit
			Blue	B	3SU1052-2CC50-0AA0	1	1 unit
			White	B	3SU1052-2CC60-0AA0	1	1 unit
	Selector, long black actuator	Latching, 90° (10:30/1:30 o'clock) 	Black	B	3SU1052-2CF10-0AA0	1	1 unit
			Red	B	3SU1052-2CF20-0AA0	1	1 unit
			Yellow	B	3SU1052-2CF30-0AA0	1	1 unit
			Green	B	3SU1052-2CF40-0AA0	1	1 unit
			Blue	B	3SU1052-2CF50-0AA0	1	1 unit
			White	B	3SU1052-2CF60-0AA0	1	1 unit

• Revised •
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Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

Selector switches

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Selector switches

3 switch positions, can be illuminated

Selector, short black actuator

Momentary contact, 2x45°
(10:30/12/1:30 o'clock),
Reset from right + left



Amber B
Black B
Red B
Yellow B
Green B
Blue B
White ►

3SU1052-2BM00-0AA0
3SU1052-2BM10-0AA0
3SU1052-2BM20-0AA0
3SU1052-2BM30-0AA0
3SU1052-2BM40-0AA0
3SU1052-2BM50-0AA0
3SU1052-2BM60-0AA0

1 1 unit
1 1 unit
1 1 unit
1 1 unit
1 1 unit
1 1 unit
1 1 unit

3SU1052-2BM50-0AA0

Latching, 2x45°
(10:30/12/1:30 o'clock)



Black B
Red B
Yellow B
Green B
White ►

3SU1052-2BL10-0AA0
3SU1052-2BL20-0AA0
3SU1052-2BL30-0AA0
3SU1052-2BL40-0AA0
3SU1052-2BL60-0AA0

1 1 unit
1 1 unit
1 1 unit
1 1 unit
1 1 unit

3SU1052-2BL30-0AA0

Selector, short black actuator

Momentary contact/latching,
2x45° (10:30/12/1:30 o'clock),
reset from left,
latching to right



Black B
White B

3SU1052-2BP10-0AA0
3SU1052-2BP60-0AA0

1 1 unit
1 1 unit

3SU1052-2BN20-0AA0

Latching/momentary contact,
2x45°, (10:30/12/ 1:30 o'clock),
reset from right,
latching to left



Black B
Red B
Green B
White B

3SU1052-2BN10-0AA0
3SU1052-2BN20-0AA0
3SU1052-2BN40-0AA0
3SU1052-2BN60-0AA0

1 1 unit
1 1 unit
1 1 unit
1 1 unit

Selector, long black actuator

Momentary contact, 2x45°
(10:30/12/1:30 o'clock),
Reset from right + left



Black B
Red B
Green B
White ►

3SU1052-2CM10-0AA0
3SU1052-2CM20-0AA0
3SU1052-2CM40-0AA0
3SU1052-2CM60-0AA0

1 1 unit
1 1 unit
1 1 unit
1 1 unit

3SU1052-2CL40-0AA0

Latching, 2x45°
(10:30/12/1:30 o'clock)



Black B
Red B
Green B
White ►

3SU1052-2CL10-0AA0
3SU1052-2CL20-0AA0
3SU1052-2CL40-0AA0
3SU1052-2CL60-0AA0

1 1 unit
1 1 unit
1 1 unit
1 1 unit

Momentary contact/ latching,
2x45°, (10:30/12/1:30 o'clock),
reset from left,
latching to right



Black B
Red B
White ►

3SU1052-2CP10-0AA0
3SU1052-2CP20-0AA0
3SU1052-2CP60-0AA0

1 1 unit
1 1 unit
1 1 unit

Latching/momentary contact,
2x45° (10:30/12/1:30 o'clock),
reset from right,
latching to left



Black B
Red B
White ►

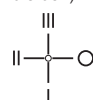
3SU1052-2CN10-0AA0
3SU1052-2CN20-0AA0
3SU1052-2CN60-0AA0

1 1 unit
1 1 unit
1 1 unit

4 switch positions

Rotary knob

Latching, 4x90°,
(0-position: 3/6/9/12 o'clock)



White B

3SU1050-2AS60-0AA0

1 1 unit

3SU1050-2AS60-0AA0






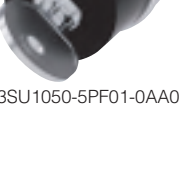

Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

• Revised •
07/15/16

Key-operated switches

Selection and ordering data

Operating principle	Make of lock	Switch position for key removal	Number of keys	DT	Order No.	PU (UNIT, SET, M)	PS*
Key-operated switches							
2 switch positions (O+I)							
 3SU1050-4BC01-0AA0	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	RONIS, SB30	O	2	►	3SU1050-4BC01-0AA0	1 1 unit
		RONIS, 455	O	2	B	3SU1050-4CC01-0AA0	1 1 unit
 3SU1050-4FC01-0AA0	Latching, 90° (10:30/1:30 o'clock)	O.M.R. 73037, red	O	2	B	3SU1050-4FC01-0AA0	1 1 unit
		O.M.R. 73038, light blue	O	2	B	3SU1050-4GC01-0AA0	1 1 unit
		O.M.R. 73034, black	O	2	B	3SU1050-4HC01-0AA0	1 1 unit
		O.M.R. 73033, yellow	O	2	B	3SU1050-4JC01-0AA0	1 1 unit
		CES, SSG10	O	2	►	3SU1050-5BC01-0AA0	1 1 unit
 3SU1050-4BF01-0AA0		CES, LSG1	O	2	B	3SU1050-5HC01-0AA0	1 1 unit
		CES, VL5	O	2	B	3SU1050-5KC01-0AA0	1 1 unit
		CES, STGH10	O	2	B	3SU1050-5LC01-0AA0	1 1 unit
		BKS, S1	O	2	B	3SU1050-5PC01-0AA0	1 1 unit
		IKON, 360012K1	O	2	B	3SU1050-5XC01-0AA0	1 1 unit
 3SU1050-4GF11-0AA0		RONIS, SB30	O	2	B	3SU1050-4BF01-0AA0	1 1 unit
			O+I	2	B	3SU1050-4BF11-0AA0	1 1 unit
			I	2	B	3SU1050-4BF21-0AA0	1 1 unit
		RONIS, 455	O	2	B	3SU1050-4CF01-0AA0	1 1 unit
			O+I	2	B	3SU1050-4CF11-0AA0	1 1 unit
 3SU1050-4HF01-0AA0			I	2	B	3SU1050-4CF21-0AA0	1 1 unit
		RONIS, 421	O+I	2	B	3SU1050-4DF11-0AA0	1 1 unit
		O.M.R. 73037, red	O	2	B	3SU1050-4FF01-0AA0	1 1 unit
			O+I	2	B	3SU1050-4FF11-0AA0	1 1 unit
			I	2	B	3SU1050-4FF21-0AA0	1 1 unit
 3SU1050-5BF01-0AA0		O.M.R. 73038, light blue	O	2	B	3SU1050-4GF01-0AA0	1 1 unit
			O+I	2	B	3SU1050-4GF11-0AA0	1 1 unit
			I	2	B	3SU1050-4GF21-0AA0	1 1 unit
		O.M.R. 73034, black	O	2	►	3SU1050-4HF01-0AA0	1 1 unit
			O+I	2	B	3SU1050-4HF11-0AA0	1 1 unit
 3SU1050-5PF01-0AA0			I	2	B	3SU1050-4HF21-0AA0	1 1 unit
		O.M.R. 73033, yellow	O	2	B	3SU1050-4JF01-0AA0	1 1 unit
			O+I	2	B	3SU1050-4JF11-0AA0	1 1 unit
			I	2	B	3SU1050-4JF21-0AA0	1 1 unit
		CES, SSG10	O	2	►	3SU1050-5BF01-0AA0	1 1 unit
 3SU1050-5BF01-0AA0			O+I	2	►	3SU1050-5BF11-0AA0	1 1 unit
			I	2	►	3SU1050-5BF21-0AA0	1 1 unit
		CES, LSG1	O	2	B	3SU1050-5HF01-0AA0	1 1 unit
			O+I	2	B	3SU1050-5HF11-0AA0	1 1 unit
		CES, VL5	O	2	B	3SU1050-5KF01-0AA0	1 1 unit
 3SU1050-5PF01-0AA0		CES, STGH10	O+I	2	►	3SU1050-5LF11-0AA0	1 1 unit
		BKS, S1	O	2	B	3SU1050-5PF01-0AA0	1 1 unit
			O+I	2	B	3SU1050-5PF11-0AA0	1 1 unit
			I	2	B	3SU1050-5PF21-0AA0	1 1 unit
		IKON, 360012K1	O	2	B	3SU1050-5XF01-0AA0	1 1 unit
 3SU1050-5XF01-0AA0			O+I	2	B	3SU1050-5XF11-0AA0	1 1 unit

• Revised •
08/31/15

Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements

Key-operated switches

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Selection and ordering data

Operating principle	Make of lock	Switch position for key removal	Number of keys	DT	Order No.	PU (UNIT, SET, M)	PS*
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Key-operated switches

3 switch positions (I+O+II)



3SU1050-4BM01-0AA0

Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from left + right



Latching, 2x45° (10:30/12/1:30 o'clock)



3SU1050-4FL11-0AA0



3SU1050-5BL01-0AA0



3SU1050-5PL01-0AA0

RONIS, SB30	O	2	B	3SU1050-4BM01-0AA0	1	1 unit
RONIS, 455	O	2	B	3SU1050-4CM01-0AA0	1	1 unit
O.M.R. 73034, black	O	2	B	3SU1050-4HM01-0AA0	1	1 unit
CES, SSG10	O	2	B	3SU1050-5BM01-0AA0	1	1 unit
CES, STGH10	O	2	B	3SU1050-5LM01-0AA0	1	1 unit
BKS, S1	O	2	B	3SU1050-5PM01-0AA0	1	1 unit
IKON, 360012K1	O	2	B	3SU1050-5XM01-0AA0	1	1 unit
RONIS, SB30	O	2	B	3SU1050-4BL01-0AA0	1	1 unit
I+O+II		2	►	3SU1050-4BL11-0AA0	1	1 unit
I		2	B	3SU1050-4BL21-0AA0	1	1 unit
II (right)		2	B	3SU1050-4BL31-0AA0	1	1 unit
I+II (left, right)		2	B	3SU1050-4BL41-0AA0	1	1 unit
O+I (center, left)		2	B	3SU1050-4BL51-0AA0	1	1 unit
RONIS, 455	O	2	B	3SU1050-4CL01-0AA0	1	1 unit
I+O+II		2	B	3SU1050-4CL11-0AA0	1	1 unit
RONIS, 421		2	B	3SU1050-4DL11-0AA0	1	1 unit
O.M.R. 73037, red	I+O+II	2	B	3SU1050-4FL11-0AA0	1	1 unit
O.M.R. 73038, light blue	O	2	B	3SU1050-4GL01-0AA0	1	1 unit
I+O+II		2	B	3SU1050-4GL11-0AA0	1	1 unit
O.M.R. 73034, black	O	2	B	3SU1050-4HL01-0AA0	1	1 unit
I+O+II		2	B	3SU1050-4HL11-0AA0	1	1 unit
CES, SSG10	O	2	►	3SU1050-5BL01-0AA0	1	1 unit
I+O+II		2	►	3SU1050-5BL11-0AA0	1	1 unit
I		2	►	3SU1050-5BL21-0AA0	1	1 unit
II (right)		2	►	3SU1050-5BL31-0AA0	1	1 unit
I+II (left, right)		2	►	3SU1050-5BL41-0AA0	1	1 unit
BKS, S1	O	2	B	3SU1050-5PL01-0AA0	1	1 unit
I+O+II		2	B	3SU1050-5PL11-0AA0	1	1 unit
I		2	B	3SU1050-5PL21-0AA0	1	1 unit
I+II (left, right)		2	B	3SU1050-5PL41-0AA0	1	1 unit
IKON, 360012K1	O	2	B	3SU1050-5XL01-0AA0	1	1 unit
I+O+II		2	B	3SU1050-5XL11-0AA0	1	1 unit




Push Button Units and Indicator Lights

3SU1 22 mm, Metal, Shiny — Actuating and Signaling Elements


• Revised •
08/31/15

Key-operated switches / Indicator lights

Selection and ordering data

	Operating principle	Make of lock	Switch position for key removal	Number of keys	DT	Order No.	PU (UNIT, SET, M)	PS*
Key-operated switches								
 3SU1050-4BP01-0AA0 	3 switch positions (I+O+II) Momentary contact/ latching, 2x45° (10:30/12/ 1:30 o'clock), reset from left, latching to the right	RONIS, SB30	O	2	B	3SU1050-4BP01-0AA0	1	1 unit
			O+II (center, right)	2	B	3SU1050-4BP61-0AA0	1	1 unit
		O.M.R. 73034, black	II (right)	2	B	3SU1050-4HP31-0AA0	1	1 unit
			O.M.R. 73033, yellow	II (right)	2	B	3SU1050-4JP31-0AA0	1
		CES, SSG10	O	2	B	3SU1050-5BP01-0AA0	1	1 unit
			II (right)	2	B	3SU1050-5BP31-0AA0	1	1 unit
	Latching/ momentary contact, 2x45° (10:30/12/ 1:30 o'clock), reset from right, latching to the left 	RONIS, SB30	O+II (center, right)	2	►	3SU1050-5BP61-0AA0	1	1 unit
			O	2	B	3SU1050-5PP01-0AA0	1	1 unit
		BKS, S1	O	2	B	3SU1050-5PP01-0AA0	1	1 unit
			O	2	B	3SU1050-4BN01-0AA0	1	1 unit
			I	2	B	3SU1050-4BN21-0AA0	1	1 unit
		CES, SSG10	O+I (center, left)	2	B	3SU1050-4BN51-0AA0	1	1 unit
O	2		B	3SU1050-5BN01-0AA0	1	1 unit		
I	2		B	3SU1050-5BN21-0AA0	1	1 unit		
CES, STGH10	O+I (center, left)	2	►	3SU1050-5BN51-0AA0	1	1 unit		
	O+I	2	►	3SU1050-5LN51-0AA0	1	1 unit		
	BKS, S1	O	2	B	3SU1050-5PN01-0AA0	1	1 unit	
	I	2	B	3SU1050-5PN21-0AA0	1	1 unit		
	O+I (center, left)	2	B	3SU1050-5PN51-0AA0	1	1 unit		

Selection and ordering data

Version of actuating element	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Indicator lights					
 <p>3SU1051-6AA40-0AA0</p> <p>Indicator lights with smooth lens</p>	Amber	B	3SU1051-6AA00-0AA0	1	1 unit
	Red	A	3SU1051-6AA20-0AA0	1	1 unit
	Yellow	A	3SU1051-6AA30-0AA0	1	1 unit
	Green	►	3SU1051-6AA40-0AA0	1	1 unit
	Blue	B	3SU1051-6AA50-0AA0	1	1 unit
	White	A	3SU1051-6AA60-0AA0	1	1 unit
	Clear	B	3SU1051-6AA70-0AA0	1	1 unit

• Revised •
08/31/15

Push Button Units and Indicator Lights

3SU1 30 mm, Round, Metal, Matte — Actuating & Signaling Elements

Pushbuttons

1

2

3

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Overview



Actuators and indicators, flat, 30mm, metal, matte
(all devices are shipped including adapter)

Selection and ordering data

Version	Operating principle	Unlatching method	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Pushbuttons							
	Pushbuttons with flat button	Momentary contact	Black	B	3SU1060-0JB10-0AA0	1	1 unit
			Red	B	3SU1060-0JB20-0AA0	1	1 unit
			Yellow	B	3SU1060-0JB30-0AA0	1	1 unit
			Green	B	3SU1060-0JB40-0AA0	1	1 unit
			Blue	B	3SU1060-0JB50-0AA0	1	1 unit
			White	B	3SU1060-0JB60-0AA0	1	1 unit
	Latching	Push to unlatch	Black	B	3SU1060-0JA10-0AA0	1	1 unit
			Red	B	3SU1060-0JA20-0AA0	1	1 unit
			Yellow	B	3SU1060-0JA30-0AA0	1	1 unit
			Green	B	3SU1060-0JA40-0AA0	1	1 unit
			Blue	B	3SU1060-0JA50-0AA0	1	1 unit
			White	B	3SU1060-0JA60-0AA0	1	1 unit
	Illuminated pushbuttons with flat button	Momentary contact	Red	B	3SU1061-0JB20-0AA0	1	1 unit
			Yellow	B	3SU1061-0JB30-0AA0	1	1 unit
			Green	B	3SU1061-0JB40-0AA0	1	1 unit
			Blue	B	3SU1061-0JB50-0AA0	1	1 unit
			Clear	B	3SU1061-0JB70-0AA0	1	1 unit
	Latching	Push to unlatch	Red	B	3SU1061-0JA20-0AA0	1	1 unit
			Yellow	B	3SU1061-0JA30-0AA0	1	1 unit
			Green	B	3SU1061-0JA40-0AA0	1	1 unit
			Blue	B	3SU1061-0JA50-0AA0	1	1 unit
			Clear	B	3SU1061-0JA70-0AA0	1	1 unit









Push Button Units and Indicator Lights

3SU1 30 mm, Round, Metal, Matte — Actuating & Signaling Elements

• Revised •
07/15/16

Selector switches

Selection and ordering data

Version	Operating principle	Color	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*
Selector switches							
2 switch positions, can be illuminated							
	Selector, short black actuator and front ring for flat mounting	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	Black	B	3SU1062-2DC10-0AA0	1	1 unit
			Red	B	3SU1062-2DC20-0AA0	1	1 unit
			Green	B	3SU1062-2DC40-0AA0	1	1 unit
			White	B	3SU1062-2DC60-0AA0	1	1 unit
	Selector, long black actuator and front ring for flat mounting	Latching, 90° (10:30/1:30 o'clock)	Black	B	3SU1062-2DF10-0AA0	1	1 unit
			Red	B	3SU1062-2DF20-0AA0	1	1 unit
			Green	B	3SU1062-2DF40-0AA0	1	1 unit
			Blue	B	3SU1062-2DF50-0AA0	1	1 unit
			White	B	3SU1062-2DF60-0AA0	1	1 unit
	Selector, long black actuator and front ring for flat mounting	Momentary contact, 45° (10:30/12 o'clock), reset from center to left	Black	B	3SU1062-2EC10-0AA0	1	1 unit
			Red	B	3SU1062-2EC20-0AA0	1	1 unit
			Green	B	3SU1062-2EC40-0AA0	1	1 unit
			White	B	3SU1062-2EC60-0AA0	1	1 unit
	Selector, long black actuator and front ring for flat mounting	Latching, 90° (10:30/1:30 o'clock)	Black	B	3SU1062-2EF10-0AA0	1	1 unit
			Red	B	3SU1062-2EF20-0AA0	1	1 unit
			Green	B	3SU1062-2EF40-0AA0	1	1 unit
			White	B	3SU1062-2EF60-0AA0	1	1 unit
3 switch positions (I+O+II), can be illuminated							
	Selector, short black actuator and front ring for flat mounting	Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right + left	Black	B	3SU1062-2DM10-0AA0	1	1 unit
			Red	B	3SU1062-2DM20-0AA0	1	1 unit
			Green	B	3SU1062-2DM40-0AA0	1	1 unit
			White	B	3SU1062-2DM60-0AA0	1	1 unit
	Selector, long black actuator and front ring for flat mounting	Latching, 2x45° (10:30/12/1:30 o'clock)	Black	B	3SU1062-2DL10-0AA0	1	1 unit
			Red	B	3SU1062-2DL20-0AA0	1	1 unit
			Blue	B	3SU1062-2DL30-0AA0	1	1 unit
			Green	B	3SU1062-2DL40-0AA0	1	1 unit
			White	B	3SU1062-2DL60-0AA0	1	1 unit
	Selector, long black actuator and front ring for flat mounting	Momentary contact, 2x45° (10:30/12/1:30 o'clock), reset from right + left	Black	B	3SU1062-2EM10-0AA0	1	1 unit
			Red	B	3SU1062-2EM20-0AA0	1	1 unit
			Green	B	3SU1062-2EM40-0AA0	1	1 unit
			White	B	3SU1062-2EM60-0AA0	1	1 unit
	Selector, long black actuator and front ring for flat mounting	Latching, 2x45° (10:30/12/1:30 o'clock)	Black	B	3SU1062-2EL10-0AA0	1	1 unit
			Red	B	3SU1062-2EL20-0AA0	1	1 unit
			Green	B	3SU1062-2EL40-0AA0	1	1 unit
			White	B	3SU1062-2EL60-0AA0	1	1 unit

• Revised •
07/15/16

Push Button Units and Indicator Lights

3SU1 30 mm, Round, Metal, Matte — Actuating & Signaling Elements

Key-operated switches / Indicator lights

Selection and ordering data

Make of lock	Operating principle	Switch position for key removal	DT	Order No.	PU (UNIT, SET, M)	PS*
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Key-operated switches with 2 keys

2 switch positions (O+I)



3SU1060-4LF11-0AA0

RONIS, SB30
and front ring for
flat mounting

Momentary contact,
45°
(10:30/12 o'clock),
reset from center to left



O

B

3SU1060-4LC01-0AA0

1

1 unit

Latching, 90°
(10:30/1:30 o'clock)



O+I

I

B

3SU1060-4LF11-0AA0

1

1 unit

1

1 unit

3 switch positions (I+O+II)



3SU1060-4LL11-0AA0

RONIS, SB30
and front ring for
flat mounting

Latching, 2x45°
(10:30/12/1:30 o'clock)



O+I+II

B

3SU1060-4LL11-0AA0

1

1 unit

Selection and ordering data

Version	Operating principle	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
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Indicator lights



3SU1061-0JD40-0AA0

Illuminated pushbuttons
with flat button

Fixed button

Red
Yellow
Green
Blue
Clear

B
B
B
B
B

3SU1061-0JD20-0AA0
3SU1061-0JD30-0AA0
3SU1061-0JD40-0AA0
3SU1061-0JD50-0AA0
3SU1061-0JD70-0AA0

1
1
1
1
1

1 unit
1 unit
1 unit
1 unit
1 unit

Special locks

Options

Special locks for key-operated switches

The plastic and metal key-operated switches of type RONIS, BKS, CES and IKON can be optionally ordered with additional locks.

In this case **"-Z"**, the order code **"Y01"** and the required lock number must be added to the Order No. of the relevant key-operated switch for standard locking.

Order code	Y01
Normal delivery time	25 working days
Additional price per unit	On request
Ordering example	3SU1000-5BF01-0AA0-Z Y01 Z = SSG18

Ordering notes

- For all special locks, an additional price applies.
- The order code **"Y01"** must be quoted in accordance with the above tables. Automated processing of the order with a defined delivery time can be guaranteed only for correctly submitted orders.
- For applications in which access security is important and several lock numbers are used, we recommend the use of BKS or CES key-operated switches.
- Special locks for VW (E1, E2, ...) will be delivered without keys, all others with 2 keys.
- With RONIS, the special locks SB31, 421 and 455 are possible.

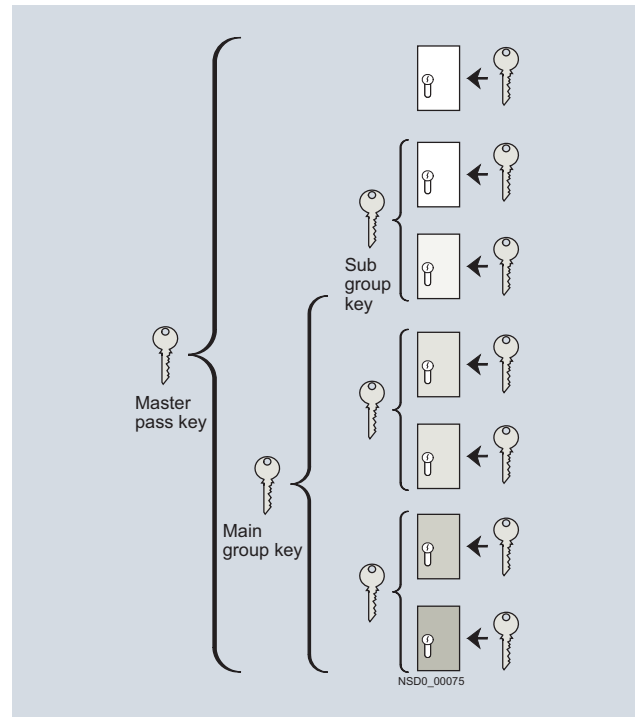
Master and master-pass key systems

The following key systems can be supplied with BKS, CES or IKON key-operated switches:

- Central lock systems
- Master key systems
- Central master key systems
- Master-pass key systems

When placing an order you must supplement the Order No. of the matching key-operated switches with **"-Z"** and quote the order code **"Y03"**.

Price and delivery time on request.





Example of master-pass key system

Selection and Ordering Data




Switch Position (front of switch)	Contact Block Circuit	Contact Block Position ¹⁾	Contact Block Order No.
Left	Right		

Two-Position Selector Switch Contact Block Selection

				
O	X	1 NO	Any Position	3SU1400-1AA10-1BA0
X	O	1 NC	Any Position	3SU1400-1AA10-1CA0
O X	X O	1 NO/1 NC	Any Position	3SU1400-1AA10-1FA0
O O	X X	2 NO	Any Position	3SU1400-1AA10-1DA0
X X	O O	2 NC	Any Position	3SU1400-1AA10-1EA0

Switch Position (front of switch)	Contact Block Circuit	Contact Block Position ¹⁾	Contact Block Order No.
Left	Center	Right	

Three-Position Selector Switch Contact Block Selection

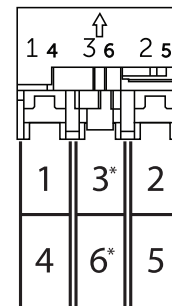
						
X	O	O	1 NO	2 or 3A	5 or 6A	3SU1400-1AA10-1BA0
X	O	X	1 NO	3	6	3SU1400-1AA10-1BA0
O	O	X	1 NO	1 or 3B	4 or 6B	3SU1400-1AA10-1BA0
O	X	X	1 NC	2 or 3A	5 or 6A	3SU1400-1AA10-1CA0
O	X	O	1 NC	3	6	3SU1400-1AA10-1CA0
X	X	O	1 NC	1 or 3B	4 or 6B	3SU1400-1AA10-1CA0
X O	O X	O X	1 NO/1 NC	2 or 3A	--	3SU1400-1AA10-1FA0
X O	O X	X O	1 NO/1 NC	3	--	3SU1400-1AA10-1FA0
O X	O X	X O	1 NO/1 NC	1 or 3B	--	3SU1400-1AA10-1FA0
X X	O O	O O	2 NO	2 or 3A	--	3SU1400-1AA10-1DA0
X X	O O	X X	2 NO	3	--	3SU1400-1AA10-1DA0
O O	O O	X X	2 NO	1 or 3B	--	3SU1400-1AA10-1DA0
O O	X X	X X	2 NC	2 or 3A	--	3SU1400-1AA10-1EA0
O O	X X	O O	2 NC	3	--	3SU1400-1AA10-1EA0
X X	X X	O O	2 NC	1 or 3B	--	3SU1400-1AA10-1EA0

Three-Position Push-Pull Contact Block Selection

Out	Center	In				
X	O	O	1 NO	2 or 3A	5 or 6A	3SU1400-1AA10-1BA0
O	O	X	1 NO	1 or 3B	4 or 6B	3SU1400-1AA10-1BA0
X	X	O	1 NC	1 or 3B	4 or 6B	3SU1400-1AA10-1CA0
O	X	X	1 NC	2 or 3A	5 or 6A	3SU1400-1AA10-1CA0
O	X	O	1 NO/1 NC	2 or 3A	--	3SU1400-1AA10-1FA0
X	X	O	1 NO/1 NC	1 or 3B	--	3SU1400-1AA10-1FA0
O	X	O	2 NC	3	--	3SU1400-1AA10-1FA0

¹⁾ Single-element Contact Blocks are stackable (2 deep). Dual Contact Blocks are not stackable.

In order to attach a Light Module to the actuator, both plungers must be removed and Light Module placed in position #3.



Rear View	Plungers Inserted	Center Module Position Numbers	Replace the asterisks in center position numbers 3* or 6*:
	Both	3 or 6	Contact Blocks Position Number will be (3 or 6) when "Both" plungers are installed.
	Right	3B or 6B	Contact Blocks Position Number will be (3B or 6B) when "Right" plunger only is installed.
	Left	3A or 6A	Contact Blocks Position Number will be (3A or 6A) when "Left" plunger only is installed.
	None	None	Both plungers are removed if Center Module Position 3 is used with LED Light Module

X ----- Contact Closed
O ----- Contact Open
3 or 6 ----- Both Plungers Inserted
3A or 6A --- Left Plunger Inserted
3B or 6B --- Right Plunger Inserted

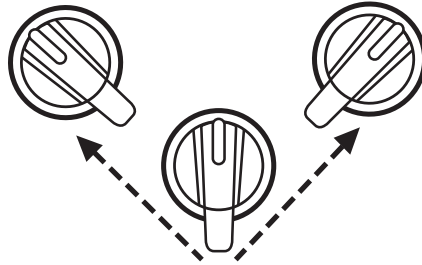
Push Button Units and Indicator Lights

Actuators and Indicators, Customized Designs

• Revised •
08/31/15

Contact Block Selection Table for Selector Switches and Key-operated Switches

Function Table



Plunger Position		Selector Switch Position ¹⁾						
Rear View	Front View	Left Position			Right Position			
		2	3	1	2	3	1	
		Activated	Activated	Not Activated	Not Activated	Activated	Activated	
		Activated	Not Activated	Not Activated	Not Activated	Activated	Activated	
		Activated	Activated	Not Activated	Not Activated	Not Activated	Activated	
		Activated	LED Available	Not Activated	Not Activated	LED Available	Activated	

- Activated
- Not Activated
- LED Available
- Plunger

¹⁾ The selector switch position is viewed from the front.

All selector switches are packaged with two plungers, which can be removed manually.

Options

Inscription of actuating and signaling elements

Actuating and signaling elements of plastic as well as metal version can be optionally inscribed with a laser.



Example of laser inscription

The actuators of the flat and raised pushbuttons, illuminated pushbuttons, twin pushbuttons, mushroom pushbuttons, illuminated mushroom pushbuttons, EMERGENCY STOP buttons, the lenses of the indicator lights, and the acoustic signaling devices can all be inscribed.

Selector switches, key-operated switches, toggle switches, coordinate switches, potentiometers and selectors can be inscribed only if they are made of plastic (only one text line on the front ring).

Version

A letter height of 4 mm is used as standard for text inscriptions.

The typeface used is Arial. Other letter heights and typefaces are possible, but must be specified when ordering.

The maximum possible number of characters per line is:

- 10 characters for one line of text
- 8 characters for 2 lines of text
- 6 characters for 3 lines of text, but 10 characters in the middle line.

Note:

Selected pushbuttons and twin pushbuttons can be supplied as standard with inscribed letters or symbols.

Ordering notes

To order, the inscribed actuating and signaling elements can be selected via the SIRIUS ACT Configurator. An electronic order form is then generated.

Configurator see

- www.siemens.com/sirius-act/configurator
- Electronic Catalog CA 01 on DVD or
- Industry Mall: www.usa.siemens.com/industrymall

When ordering, supplement the Order No. of the actuating element or the indicator light with **"-Z"** and an order code:

- Text line in upper/lower case, always upper case for beginning of line (e.g. "Lift / Off"): **Y10**
- Text in upper case (e.g. "LIFT"): **Y11**
- Text in lower case (e.g. "lift / off / lower"): **Y12**
- Text in upper/lower case, all words begin with upper case letters (e.g. "On Off"): **Y15**
- Symbol with number according to ISO 7000 or IEC 60417: **Y13**
- Any inscription or symbol according to order form supplement: **Y19**

When ordering, specify the required inscription in plain text in addition to the Order No. and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language. In the case of symbols with number, quote the corresponding standard (see ordering example 1).

In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 = Lower". For long words you can also specify the end-of-line division.

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417 (see ordering examples 2 and 3).

The SIRIUS ACT Configurator must be used to select special inscriptions and symbols (order code Y19). In this case a "CIN" (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mall shopping cart) or via the standard order channels.

Ordering example 1

A round pushbutton with the inscription "Reset" is required:

3SU1030-0AA40-0AA0-Z

Y10

Z = Reset (English)

Ordering example 2

A flat pushbutton inscribed with symbol No. 5389 according to IEC 60417 is required:

3SU1900-0FT10-0AA0

Y13

Z = 5389 IEC

Ordering example 3

A round pushbutton inscribed with symbol No. 1118 according to ISO 7000 is required:

3SU1030-0AB20-0AA0-Z

Y13

Z = 1118 ISO




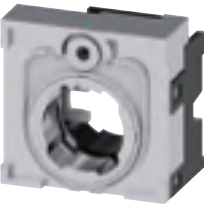
Holders without module

Overview

Holders made of plastic can only be attached to actuators and indicators made of plastic (3SU100) or plastic with metal front ring (3SU103).

Metal holders can be attached to all versions of actuators and indicators. Metal holders are automatically grounded by their fastening screw, but a grounding stud can also be fitted.

Selection and ordering data

	Version	Holder material	DT	Order No.	PU (UNIT, SET, M)	PS*
Holders without module						
	3x without module	Plastic	A	3SU1500-0AA10-0AA0	1	1 unit
	4x without module For selector switch with 4 switch positions and for coordinate switches	Plastic	A	3SU1500-0BA10-0AA0	1	1 unit
Holders without module						
	3x without module	Metal	A	3SU1550-0AA10-0AA0	1	1 unit
	4x without module For selector switch with 4 switch positions and for coordinate switches	Metal	A	3SU1550-0BA10-0AA0	1	1 unit

• Revised •
07/15/16

Push Button Units and Indicator Lights

Holders

Holders with module

1

2

3

4

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6

7

8

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10

Selection and ordering data

Number of Contact modules	LED modules	NO contacts	NC con- tacts	Color of light source	DT	Screw terminals	⊕	PU (UNIT, SET, M)	PS*	PG
						Article No.	Price per PU			

Holders with module



3SU1500-1AA10-1BA0



3SU1501-1AG20-1CA0



3SU1501-1AG20-1LA0

3x with module, plastic

1	0	1	0	--	B	3SU1500-1AA10-1BA0		1	1 unit	41J
		0	1		B	3SU1500-1AA10-1CA0		1	1 unit	41J
2	0	2	0	--	B	3SU1500-1AA10-1NA0		1	1 unit	41J
2	0	0	2		B	3SU1500-1AA10-1PA0		1	1 unit	41J

3x with contact and LED module¹⁾ (6 ... 24 V AC/DC)

1	1	1	0	Amber	B	3SU1501-1AG00-1BA0		1	1 unit	41J
				Red	B	3SU1501-1AG20-1BA0		1	1 unit	41J
				Yellow	B	3SU1501-1AG30-1BA0		1	1 unit	41J
				Green	B	3SU1501-1AG40-1BA0		1	1 unit	41J
				Blue	B	3SU1501-1AG50-1BA0		1	1 unit	41J
				White	B	3SU1501-1AG60-1BA0		1	1 unit	41J
		0	1	Amber	⊖	3SU1501-1AG00-1CA0		1	1 unit	41J
				Red	⊖	3SU1501-1AG20-1CA0		1	1 unit	41J
				Yellow	⊖	3SU1501-1AG30-1CA0		1	1 unit	41J
				Green	⊖	3SU1501-1AG40-1CA0		1	1 unit	41J
				Blue	⊖	3SU1501-1AG50-1CA0		1	1 unit	41J
				White	⊖	3SU1501-1AG60-1CA0		1	1 unit	41J
2	1	0	1	Amber	⊖	3SU1501-1AG00-1NA0		1	1 unit	41J
				Red	⊖	3SU1501-1AG20-1NA0		1	1 unit	41J
				Yellow	⊖	3SU1501-1AG30-1NA0		1	1 unit	41J
				Green	⊖	3SU1501-1AG40-1NA0		1	1 unit	41J
				Blue	⊖	3SU1501-1AG50-1NA0		1	1 unit	41J
				White	⊖	3SU1501-1AG60-1NA0		1	1 unit	41J

¹⁾ Only for use with SIRIUS commanding and signaling devices.

Number of Contact modules	NO contacts	NC contacts	DT	Screw terminals	⊕	PU (UNIT, SET, M)	PS*	PG
				Article No.	Price per PU			

Holders with module



3SU1550-1AA10-1BA0

3x with module, metal

1	1	0		B	3SU1550-1AA10-1BA0		1	1 unit	41J
	0	1	⊖	B	3SU1550-1AA10-1CA0		1	1 unit	41J
2	2	0	⊖	B	3SU1550-1AA10-1NA0		1	1 unit	41J
	0	2	⊖	B	3SU1550-1AA10-1PA0		1	1 unit	41J

⊖ Positive opening according to IEC 60947-5-1, Annex K.
Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System;
[see page 11/1 onwards.](#)
Certificate:



Contact modules

Overview

Contact modules and LED modules

The contact modules are fitted with slow-action contacts (NO contacts or NC contacts). These ensure a high switching reliability even with small voltages and currents, such as 5 V/1 mA. They are suitable for use in electronic systems as well as conventional controls. The contact pieces of the NC contacts are positively driven.

Only LED modules with permanently integrated LEDs are available for illumination.

Contact modules and LED modules bear terminal designations acc. to EN 50013

Mounting the modules


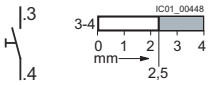
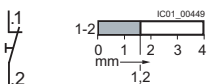
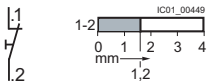
With SIRIUS ACT, the modules are mounted on the holder without any further accessories. Holders in plastic or metal versions are available for mounting three modules.

Connection methods

The modules are available with:

- Screw terminals
- Spring-type terminals or
- Solder pin connection (0.8 mm × 0.8 mm solder pins) for assembly on printed circuit boards

Selection and ordering data

Contact version	Number of NO contacts	Number of NC contacts	DT	Screw terminals	PU (UNIT, SET, M)	PS*
Order No.						
Contact modules for front plate mounting						
 3SU1400-1AA10-1BA0	Silver alloy	1	0		3SU1400-1AA10-1BA0	1 1 unit
		0	1		3SU1400-1AA10-1CA0	1 1 unit
		0	1 with installation monitoring ¹⁾		3SU1400-1AA10-1HA0	1 1 unit

¹⁾ The contact module has 1 NO internal contact + 1 NC internal contact. The NO contact is connected in series with the NC contact and brought out at terminal 1-2. When the module is snapped onto the holder, the NO contact closes. It opens when the module is detached from the holder again (the NC contact remains closed). The NC contact opens when the EMERGENCY STOP device is actuated (the NO contact remains closed). The contact is closed only when both the NC and NO contacts are closed. Unsuitable for mounting in 3SU18 enclosure.

⊕ Positive opening according to IEC 60947-5-1, Annex K. Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System; see page 11/1 onwards.
Certificate:



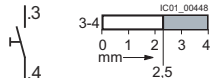
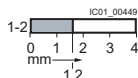

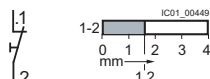


• Revised •
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Push Button Units and Indicator Lights

Modules for Actuators and Indicators

Contact modules

Contact version	Number of		DT	Spring-type terminals		PU (UNIT, SET, M)	PS*	
	NO contacts	NC contacts						
Contact modules for front plate mounting				Order No.				
	Silver alloy	1	0		▶	3SU1400-1AA10-3BA0	1	1 unit
		0	1				1	1 unit
		0	1 with installation monitor- ing ¹⁾				▶	3SU1400-1AA10-3HA0

¹⁾ The contact module has 1 NO internal contact + 1 NC internal contact. The NO contact is connected in series with the NC contact and brought out at terminal 1-2. When the module is snapped onto the holder, the NO contact closes. It opens when the module is detached from the holder again (the NC contact remains closed). The NC contact opens when the EMERGENCY STOP device is actuated (the NO contact remains closed). The contact is closed only when both the NC and NO contacts are closed. Unsuitable for mounting in 3SU18 enclosure.

⊖ Positive opening according to IEC 60947-5-1, Annex K.
Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System;
[see page 11/1 onwards](#).
Certificate:



Push Button Units and Indicator Lights





Modules for Actuators and Indicators

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LED modules

Selection and ordering data

	Operational voltage at AC	Operational voltage at DC	Color	DT	Screw terminals		PU (UNIT, SET, M)	PS*
	V	V			Order No.			
LED modules ¹⁾ for front plate mounting								
	24	24	Amber	A	3SU1401-1BB00-1AA0		1	1 unit
			Red	▶	3SU1401-1BB20-1AA0		1	1 unit
			Yellow	▶	3SU1401-1BB30-1AA0		1	1 unit
			Green	▶	3SU1401-1BB40-1AA0		1	1 unit
			Blue	▶	3SU1401-1BB50-1AA0		1	1 unit
			White	▶	3SU1401-1BB60-1AA0		1	1 unit
3SU1401-1BB30-1AA0								
	110	--	Amber	B	3SU1401-1BC00-1AA0		1	1 unit
			Red	▶	3SU1401-1BC20-1AA0		1	1 unit
			Yellow	▶	3SU1401-1BC30-1AA0		1	1 unit
			Green	▶	3SU1401-1BC40-1AA0		1	1 unit
			Blue	▶	3SU1401-1BC50-1AA0		1	1 unit
			White	▶	3SU1401-1BC60-1AA0		1	1 unit
	230	--	Amber	B	3SU1401-1BF00-1AA0		1	1 unit
			Red	▶	3SU1401-1BF20-1AA0		1	1 unit
			Yellow	▶	3SU1401-1BF30-1AA0		1	1 unit
			Green	▶	3SU1401-1BF40-1AA0		1	1 unit
			Blue	▶	3SU1401-1BF50-1AA0		1	1 unit
			White	▶	3SU1401-1BF60-1AA0		1	1 unit
					Spring-type terminals			
	24	24	Amber	B	3SU1401-1BB00-3AA0		1	1 unit
			Red	▶	3SU1401-1BB20-3AA0		1	1 unit
			Yellow	▶	3SU1401-1BB30-3AA0		1	1 unit
			Green	▶	3SU1401-1BB40-3AA0		1	1 unit
			Blue	▶	3SU1401-1BB50-3AA0		1	1 unit
			White	▶	3SU1401-1BB60-3AA0		1	1 unit
3SU1401-1BB30-3AA0								
	110	--	Amber	B	3SU1401-1BC00-3AA0		1	1 unit
			Red	▶	3SU1401-1BC20-3AA0		1	1 unit
			Yellow	B	3SU1401-1BC30-3AA0		1	1 unit
			Green	▶	3SU1401-1BC40-3AA0		1	1 unit
			Blue	B	3SU1401-1BC50-3AA0		1	1 unit
			White	▶	3SU1401-1BC60-3AA0		1	1 unit
	230	--	Amber	B	3SU1401-1BF00-3AA0		1	1 unit
			Red	▶	3SU1401-1BF20-3AA0		1	1 unit
			Yellow	B	3SU1401-1BF30-3AA0		1	1 unit
			Green	▶	3SU1401-1BF40-3AA0		1	1 unit
			Blue	B	3SU1401-1BF50-3AA0		1	1 unit
			White	▶	3SU1401-1BF60-3AA0		1	1 unit

¹⁾ Only for use with SIRIUS commanding and signaling devices.

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Push Button Units and Indicator Lights

Modules for Actuators and Indicators

LED modules

1
2
3
4
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10



3SU1401-1BG30-1AA0



3SU1401-1BG30-3AA0

Operational voltage at AC	Operational voltage at DC	Color	DT	Screw terminals	PU (UNIT, SET, M)	PS*
V	V			Order No.		
LED modules¹⁾ for front plate mounting						
6 ... 24	6 ... 24	Amber Red Yellow Green Blue White	A ▶ ▶ ▶ ▶ ▶	3SU1401-1BG00-1AA0 3SU1401-1BG20-1AA0 3SU1401-1BG30-1AA0 3SU1401-1BG40-1AA0 3SU1401-1BG50-1AA0 3SU1401-1BG60-1AA0	1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
24 ... 240	24 ... 240	Amber Red Yellow Green Blue White	B ▶ ▶ ▶ ▶ ▶	3SU1401-1BH00-1AA0 3SU1401-1BH20-1AA0 3SU1401-1BH30-1AA0 3SU1401-1BH40-1AA0 3SU1401-1BH50-1AA0 3SU1401-1BH60-1AA0	1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
				Spring-type terminals		
6 ... 24	6 ... 24	Amber Red Yellow Green Blue White	B ▶ ▶ ▶ ▶ ▶	3SU1401-1BG00-3AA0 3SU1401-1BG20-3AA0 3SU1401-1BG30-3AA0 3SU1401-1BG40-3AA0 3SU1401-1BG50-3AA0 3SU1401-1BG60-3AA0	1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
24 ... 240	24 ... 240	Amber Red Yellow Green Blue White	B B B ▶ B B	3SU1401-1BH00-3AA0 3SU1401-1BH20-3AA0 3SU1401-1BH30-3AA0 3SU1401-1BH40-3AA0 3SU1401-1BH50-3AA0 3SU1401-1BH60-3AA0	1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit

¹⁾ Only for use with SIRIUS commanding and signaling devices.



3SU1401-1CK10-1AA0

Operational voltage at AC	Operational voltage at DC	DT	Screw terminals	PU (UNIT, SET, M)	PS*
V	V		Order No.		
LED test modules¹⁾ for front plate mounting					
12 ... 240	12 ... 240	▶	3SU1400-1CK10-1AA0	1	1 unit

Operational voltage at AC	Operational voltage at DC	Color	DT	Socket terminals (THT)	PU (UNIT, SET, M)	PS*
V	V			Order No.		

LED modules¹⁾ for mounting on printed circuit boards



3SU1401-3BA20-5AA0

--	5	Amber Red Yellow Green Blue White	B ▶ ▶ ▶ ▶ ▶	3SU1401-3BA00-5AA0 3SU1401-3BA20-5AA0 3SU1401-3BA30-5AA0 3SU1401-3BA40-5AA0 3SU1401-3BA50-5AA0 3SU1401-3BA60-5AA0	1 1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
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¹⁾ Only for use with SIRIUS commanding and signaling devices.





Push Button Units and Indicator Lights

Modules for Actuators and Indicators


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AS-Interface modules




Selection and ordering data

Operational voltage		Slave type	Number of digital inputs		Number of digital outputs	DT	Screw terminals + Spring-type terminals	PU (UNIT, SET, M)	PS*
			Standard	Safety-related			Order No.		
AS-Interface modules for front plate mounting									
	30 V	2 F-DI	--	2	--	B	3SU1400-1EA10-2AA0	1	1 unit
	30 V	2 F-DI + 1 LED	--	2	--	B	3SU1401-1EE20-2AA0	1	1 unit
		2 F-DI + 1 DQ	--	2	1	B	3SU1400-1EC10-2AA0	1	1 unit
	30 V	2 F-DI	--	2	--	B	3SU1400-1EA10-4AA0	1	1 unit
		2 F-DI + 1 LED	--	2	--	B	3SU1401-1EE20-4AA0	1	1 unit
		2 F-DI + 1 DQ	--	2	1	B	3SU1400-1EC10-4AA0	1	1 unit
		4 DI + 3 DO	--	4	3	B	3SU1400-1EJ10-6AA0	1	1 unit
		4 DI + 4 DO	--	4	4	B	3SU1400-1EK10-6AA0	1	1 unit
Electronic module for IO-Link, front panel mounting									
	24 V	Freely programmable (default 6DI/2DQ)	0-8	--	0-8	B	3SU1400-1HL10-6AA0	1	1 unit

Technical specifications

Order No.		3SU1400-1GC10-1AA0	3SU1400-1GD10-1AA0	
Communication				
Protocol is supported by IO-Link protocol		No	Yes	
Product function		Group ID 24 V DC	IO-Link 24 V DC	
IO-Link transfer rate		--	COM2 (38.4 kBaud)	
Point-to-point cycle time between the master and the IO-Link device minimum		ms	--	10
Type of voltage supply via IO-Link master		--	3	
Data volume				
• of the address area of the inputs with cyclic transfer total	bytes	--	2	
• of the address area of the outputs with cyclic transfer total	bytes	--	0	
Number of NO contacts		5	5	
General data				
Impulse withstand voltage rated value		V	800	
Insulation voltage rated value		V	30	
Pollution degree		3		
Type of voltage				
• of operational voltage		DC		
• of input voltage		DC		
Operational voltage				
• 1 at DC rated value	V	24		
• Rated value	V	18 ... 30		
Current consumed maximum		mA	49	
Ambient temperature				
• During operation	°C	-25 ... +70		
• During storage	°C	-40 ... +80		
IP degree of protection		IP20		
Touch protection against electric shock		Finger-safe		
Connections				
Type of electrical connection		Screw terminals		
Connectable conductor cross-section for auxiliary contacts				
• Solid or stranded	mm²	0.2 ... 2.5		
• Solid				
- With end sleeves	mm²	0.2 ... 0.75		
• Finely stranded				
- With end sleeves	mm²	0.25 ... 1.5		
- Without end sleeves	mm²	0.2 ... 2.5		
AWG number as coded connectable conductor cross-section				
• For auxiliary contacts		26 ... 14		
Tightening torque				
• For screw terminals	Nm	0.4 ... 0.8		

Selection and ordering data

	Type of voltage supply via IO-Link master	Protocol is supported IO-Link protocol	Number of NO contacts	IO-Link transfer rate	DT	Screw terminals 	PU (UNIT, SET, M)	PS*
						Order No.		
Electronic modules for ID key-operated switches								
	--	No	5	--	B	3SU1400-1GC10-1AA0	1	1 unit
	Yes	Yes	5	COM2 (38.4 kBaud)	X	3SU1400-1GD10-1AA0	1	1 unit

3SU1400-1GD10-1AA0
✓ Yes -- No

General data

Overview

Design



Enclosures with standard fittings

Enclosed SIRIUS ACT pushbuttons and indicator lights are used as hand-operated commanding devices for separately allocated control units and cabinets. The devices are suitable for use in any climate.

Standards

IEC 60947-5-1 or EN 60947-5-1

Versions

The enclosed pushbuttons and indicator lights are available with conventional controls as well as for connection to AS-Interface. The following versions are available:

- Empty enclosures with 1 to 6 command points (the installed components must be ordered separately; use modules for base mounting)
- Enclosures with standard fittings with 1 to 3 command points, e.g. EMERGENCY STOP enclosure with EMERGENCY STOP mushroom pushbutton
- Enclosures with customized fittings with 1 to 6 command points

Color of the enclosures

Top:

- Gray, RAL 7035
- Yellow, RAL 1004 for EMERGENCY STOP

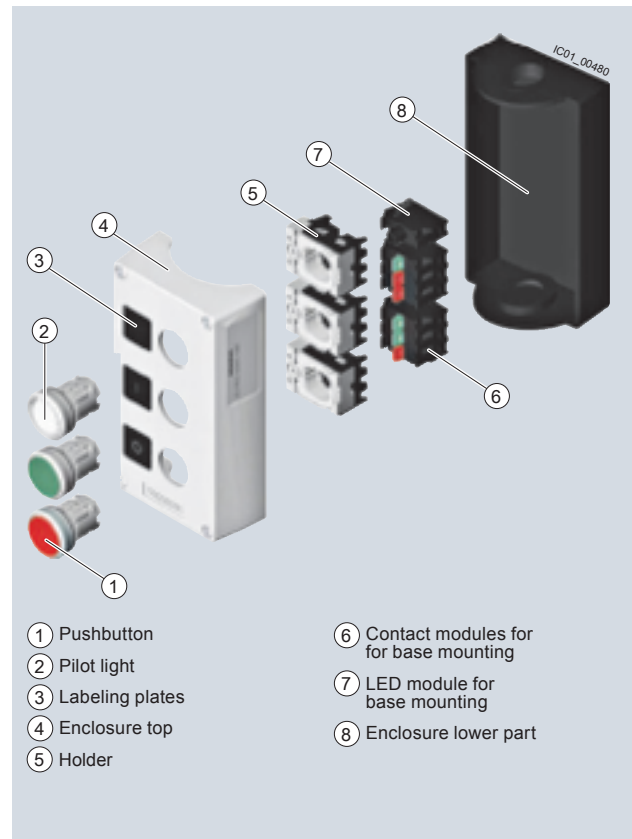
Base:

- Black, RAL 9005

Customized enclosures

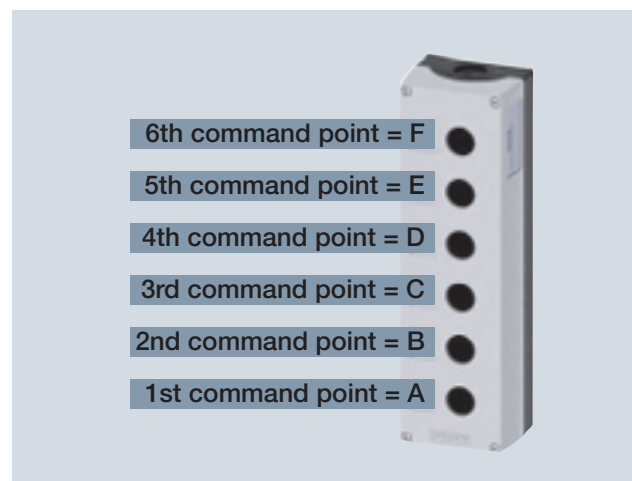
The fittings and labeling of the command points can be chosen using the Configurator on the Internet, [see: www.siemens.com/sirius-act/configurator](http://www.siemens.com/sirius-act/configurator)

Enclosures with standard fittings



Pushbuttons and indicator lights in the enclosure

Nomenclature of command points



Application

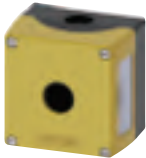
The enclosures are climate-proof (KTW 24) according to EN ISO 6270-2 and suitable for stationary use, and for use in marine applications.

Selection and ordering data

Color of enclosure top	Number of command points	Enclosure version	DT	Order No.	PU (UNIT, SET, M)	PS*
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Enclosures for surface mounting

Plastic version



3SU1801-0AA00-0AA2



3SU1802-0AA00-0AB1

Yellow	1	Center command point	A	3SU1801-0AA00-0AA2	1	1 unit
		With protective collar	A	3SU1801-0AA00-0AC2	1	1 unit
		With recess for labeling plate	A	3SU1801-0AA00-0AB2	1	1 unit
	2	With recess for labeling plate	▶	3SU1802-0AA00-0AB2	1	1 unit
Gray	1	With recess for labeling plate	A	3SU1801-0AA00-0AB1	1	1 unit
	2	With recess for labeling plate	A	3SU1802-0AA00-0AB1	1	1 unit
	3	With recess for labeling plate	A	3SU1803-0AA00-0AB1	1	1 unit
	4	With recess for labeling plate	A	3SU1804-0AA00-0AB1	1	1 unit
	6	With recess for labeling plate	A	3SU1806-0AA00-0AB1	1	1 unit

Metal version



3SU1851-0AA00-0AC2



3SU1853-0AA00-0AB1



3SU1854-0AA00-0AB1

Yellow	1	Center command point	B	3SU1851-0AA00-0AA2	1	1 unit
		With protective collar	B	3SU1851-0AA00-0AC2	1	1 unit
		With recess for labeling plate	A	3SU1851-0AA00-0AB2	1	1 unit
Gray	1	With recess for labeling plate	▶	3SU1851-0AA00-0AB1	1	1 unit
		With protective collar	B	3SU1851-0AA00-0AC1	1	1 unit
	2	With recess for labeling plate	▶	3SU1852-0AA00-0AB1	1	1 unit
	3	With recess for labeling plate	▶	3SU1853-0AA00-0AB1	1	1 unit
	4	With recess for labeling plate	▶	3SU1854-0AA00-0AB1	1	1 unit
	6	With recess for labeling plate	B	3SU1856-0AA00-0AB1	1	1 unit

Enclosure for 4-position selector and coordinate switch

Plastic version



3SU1801-1AA00-1AA1

Gray	1	Center command point	B	3SU1801-1AA00-1AA1	1	1 unit
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Metal version

Gray	1	Center command point	B	3SU1851-1AA00-1AA1	1	1 unit
------	---	----------------------	---	--------------------	---	--------



Pushbuttons and indicator lights in the enclosure

Overview

Pushbuttons and indicator lights in the enclosure (standard fittings) are available with:

- 1 to 3 command points
- Operating voltage up to 400 V
- Vertical mounting type
- Plastic enclosures are equipped with plastic actuators and indicators, metal enclosures are equipped with metal actuators and indicators
- Contact modules and LED modules for base mounting (are snapped into the enclosure base); screw terminals as standard; some versions also with spring-type terminals

Selection and ordering data




Color enclosure top	Number of command points	Enclosure version Command point fittings	Color of actuating element Marking	Number of: NC contacts	NO contacts	DT	Order No.	PU (UNIT, SET, M)	PS*
Enclosures with standard fittings									
Plastic version									
	Yellow	1	Center command point	Red	1	0	A	3SU1801-0NA00-2AA2	1 1 unit
			A = EMERGENCY STOP mushroom pushbutton, 40 mm, with positive latching function according to ISO 13850, Rotate to unlatch						
			With protective collar	Red	1	0	A	3SU1801-0NA00-2AC2	1 1 unit
			A = EMERGENCY STOP mushroom pushbutton, 40 mm, with positive latching function according to ISO 13850, Rotate to unlatch						
					2	0	A	3SU1801-0NB00-2AC2	1 1 unit
		2	With recess for labeling plate	A = red, without inscription B = red, without inscription	2	1	B	3SU1802-0NB00-2AB2	1 1 unit
			A = EMERGENCY STOP mushroom pushbutton, 40 mm, with positive latching function according to ISO 13850, Rotate to unlatch B = indicator light						

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Push Button Units and Indicator Lights

Enclosures

Pushbuttons and indicator lights in the enclosure

Color enclosure top	Number of command points	Enclosure version Command point fittings	Color of actuating element Marking	Number of: NC contacts NO contacts		DT	Order No.	PU (UNIT, SET, M)	PS*	
Enclosures with standard fittings										
Plastic version										
	Gray	1	With recess for labeling plate	A = green, I	0	1	B	3SU1801-0AB00-2AB1	1	1 unit
			A = pushbutton	A = red, O	1	0	B	3SU1801-0AC00-2AB1	1	1 unit
				A = white, I	0	1	B	3SU1801-0AD00-2AB1	1	1 unit
				A = black, O	1	0	B	3SU1801-0AE00-2AB1	1	1 unit
3SU1801-0AB00-2AB1										
		2	With recess for labeling plate A = pushbutton / B = pushbutton	A = red, O B = green, I	1	1	B	3SU1802-0AB00-2AB1	1	1 unit
				A = black, O B = black, I	1	1	B	3SU1802-0AC00-2AB1	1	1 unit
3SU1802-0AB00-2AB1										
		3	With recess for labeling plate A = pushbutton / B = pushbutton / C = indicator light	A = red, O B = green, I C = clear, without inscription	1	1	B	3SU1803-0AB00-2AB1	1	1 unit
				A = black, O B = white, I C = clear, without inscription	1	1	B	3SU1803-0AC00-2AB1	1	1 unit
				A = red, O B = black, I C = black, II	1	2	B	3SU1803-0AD00-2AB1	1	1 unit
3SU1803-0AB00-2AB1										

3SU1801-0AB00-2AB1








3SU1802-0AB00-2AB1

3SU1803-0AB00-2AB1

Push Button Units and Indicator Lights Enclosures

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Pushbuttons and indicator lights in the enclosure

Color enclosure top	Number of command points	Enclosure version	Command point fittings	Color of actuating element	Marking	Number of:	DT	Order No.	PU (UNIT, SET, M)	PS*			
						NC contacts	NO contacts						
Enclosures with standard fittings													
Metal version													
	Yellow	1	Center command point	Red		1	0	▶	3SU1851-0NA00-2AA2	1	1 unit		
						2	0	▶		3SU1851-0NB00-2AA2	1	1 unit	
A = EMERGENCY STOP mushroom pushbutton, 40 mm, with positive latching function according to ISO 13850, Rotate to unlatch													
			With protective collar	Red		1	0	▶	3SU1851-0NA00-2AC2	1	1 unit		
						2	1	B		3SU1851-0NB00-2AC2	1	1 unit	
						2	1	B		3SU1851-0ND00-2AC2	1	1 unit	
A = EMERGENCY STOP mushroom pushbutton, 40 mm, with positive latching function according to ISO 13850, Rotate to unlatch													
	Gray	1	With recess for labeling plate	A = green, I		0	1	B	3SU1851-0AB00-2AB1	1	1 unit		
						A = red, O	1	0		B	3SU1851-0AC00-2AB1	1	1 unit
						A = white, I	0	1		B	3SU1851-0AD00-2AB1	1	1 unit
						A = black, O	1	0		B	3SU1851-0AE00-2AB1	1	1 unit
A = pushbutton													
		2	With recess for labeling plate	A = red, O	B = green, I	1	1	B	3SU1852-0AB00-2AB1	1	1 unit		
						A = pushbutton / B = pushbutton							
				A = black, O	B = white, I	1	1	B	3SU1852-0AC00-2AB1	1	1 unit		
		3	With recess for labeling plate	A = red, O	B = green, I	1	1	B	3SU1853-0AB00-2AB1	1	1 unit		
										A = pushbutton / B = pushbutton / C = indicator light			
			With recess for labeling plate	A = red, O	B = black, I	1	2	B	3SU1853-0AD00-2AB1	1	1 unit		
										A = pushbutton / B = pushbutton / C = pushbutton			

Pushbuttons and indicator lights in the enclosure

Number of command points	Product function / EMERGENCY STOP function	DT	Order No.	PU (UNIT, SET, M)	PS*
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Customized enclosures¹⁾



Plastic version

1	No	A	3SU1801-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1801-0NZ00 K0Y	1	1 unit
2	No	A	3SU1802-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1802-0NZ00 K0Y	1	1 unit
3	No	A	3SU1803-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1803-0NZ00 K0Y	1	1 unit
4	No	A	3SU1804-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1804-0NZ00 K0Y	1	1 unit
6	No	A	3SU1806-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1806-0NZ00 K0Y	1	1 unit



Metal version

1	No	A	3SU1851-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1851-0NZ00 K0Y	1	1 unit
2	No	A	3SU1852-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1852-0NZ00 K0Y	1	1 unit
3	No	A	3SU1853-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1853-0NZ00 K0Y	1	1 unit
4	No	A	3SU1854-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1854-0NZ00 K0Y	1	1 unit
6	No	A	3SU1856-0AZ00 K0Y	1	1 unit
	Yes	A	3SU1856-0NZ00 K0Y	1	1 unit

¹⁾ The fittings and labeling of the command points can be chosen using the Configurator on the Internet. The prices depend on the equipment selected; see www.siemens.com/sirius-act/configurator.

Pushbuttons and indicator lights in the enclosure for AS-Interface

Overview

With AS-Interface enclosures, distributed SIRIUS ACT pushbuttons and indicator lights can be quickly connected to the AS-Interface communication system. Using suitable components you can assemble your own enclosures with integrated AS-Interface or flexibly modify existing enclosures.



Enclosures for AS-Interface

Enclosures

Color of enclosure top:

- Gray, RAL 7035
- Yellow, RAL 1004, for EMERGENCY STOP

Color of enclosure lower part:

- Black, RAL 9005

Equipping with AS-Interface slaves

The following slaves are available for connecting the command points:

- Slave in A/B technology with 4 digital inputs and 3 digital outputs (4 DI / 3 DO)
- Slave with 4 digital inputs and 4 digital outputs (4 DI / 4 DO)
- F slave with 2 safe inputs for EMERGENCY STOP mushroom pushbutton (2 F-DI), also with LED
- F slave with 2 safe inputs and one digital output (2 F-DI + 1 DO)

The following table shows the maximum number of slaves possible:

Number of command points	Number of slaves for enclosures without EMERGENCY STOP	Number of slaves for enclosures with EMERGENCY STOP
1	--	1 x F slave 2 F-DI
2	1 x slave 4 DI/4 DO or 4 DI/3 DO	--
3	1 x slave 4 DI/4 DO or 4 DI/3 DO	1 x slave 4 DI/4 DO or 4 DI/3 DO + 1 x F slave
4	2 x slave 4 DI/4 DO or 4 DI/3 DO	2 x slave 4 DI/4 DO or 4 DI/3 DO + 1 x F slave
6	2 x slave 4 DI/4 DO or 4 DI/3 DO	2 x slave 4 DI/4 DO or 4 DI/3 DO + 1 x F slave

Connection

One set of links is required in each case to connect a slave to contact modules, LED modules, and the connection element.

The connection elements are mounted in the front-end cable glands and are used to connect the AS-Interface or bring unused inputs or outputs out of the enclosure.

For connection to AS-Interface, the following options are available:

- Terminal for shaped AS-Interface cable. The cable is contacted by the insulation piercing method and routed past the enclosure on the outside (possible only with plastic enclosure).
- Cable gland for the shaped AS-Interface cable or round cable. The cable is routed into the enclosure (preferable for metal enclosure).
- Connection using M12 plug.

If less than all inputs/outputs of the installed slaves in an enclosure are used for connecting the commanding devices, free inputs and outputs can be routed on request to the outside through an M12 socket on the top or bottom side of the enclosure.

To supply inputs with power, the S+ connection of the slave must be assigned to the socket, for outputs the OUT- connection must be assigned. Addressing is performed using the AS-Interface connections or the integrated addressing socket. An external power supply is not required.

Enclosures with standard fittings

Enclosures with standard fittings are available with:

- 1 to 3 command points
- Operational voltage through AS-Interface (approx. 30 V)
- Vertical mounting type
- Plastic enclosures are equipped with plastic actuators and indicators, metal enclosures are equipped with metal actuators and indicators

The enclosures without EMERGENCY STOP each have one module with 4I/3O; the enclosures with EMERGENCY STOP mushroom pushbuttons have a safe AS-Interface slave integrated in the enclosure. Enclosures with EMERGENCY STOP mushroom pushbuttons are fitted with two NC contact modules, which are wired to the safe F slave.

The contact modules and LED modules (with spring-type terminals) of the commanding devices and the AS-Interface slaves are mounted in the base of the enclosure and connected using cables. The plastic enclosures are designed with a connection for the AS-Interface flat cable (the cable is run along the outside of the enclosure). For metal enclosures, the AS-Interface cable is run inside the enclosure.

The enclosures with EMERGENCY STOP mushroom pushbuttons are also available with an M12 connector.

Customized enclosures (selection by configurator)

To order customized 3SU18 AS-Interface enclosures with pushbuttons and indicator lights, use the 3SU1 configurator to select the elements for equipping. An electronic order form will be generated for the options.

Configurator see www.siemens.com/sirius-act/configurator

Selection and ordering data

Color of enclosure top	Number of command points	Enclosure version Command point fittings	Color, marking	DT	Insulation piercing method	PU (UNIT, SET, M)	PS*
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Order No.

Enclosures with standard fittings

Plastic version



3SU1801-0NB10-4HB2



3SU1802-0AB10-4HB1



3SU1803-0AB10-4HB1

Yellow	1	With recess for labeling plate A = EMERGENCY STOP mushroom push-button 40 mm, with positive latching function according to ISO 13850, Rotate to unlatch	Red	B	3SU1801-0NB10-4HB2	1	1 unit
Gray	2	With recess for labeling plate A = pushbutton / B = pushbutton	A = red, O B = green, I	B	3SU1802-0AB10-4HB1	1	1 unit
			A = black, O B = white, I	B	3SU1802-0AC10-4HB1	1	1 unit
	3	With recess for labeling plate A = pushbutton / B = pushbutton / C = indicator light	A = red, O B = green, I C = clear, without inscription	B	3SU1803-0AB10-4HB1	1	1 unit

Number of command points	Emergency stop functionality	DT	Order No.	PU (UNIT, SET, M)	PS*
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Customer specific enclosures for AS-Interface

Plastic version



1	No	A	3SU1801-0NZ10 K0Y	1	1 unit
2	No	A	3SU1802-0AZ10 K0Y	1	1 unit
	Yes	A	3SU1802-0NZ10 K0Y	1	1 unit
3	No	A	3SU1803-0AZ10 K0Y	1	1 unit
	Yes	A	3SU1803-0NZ10 K0Y	1	1 unit
4	No	A	3SU1804-0AZ10 K0Y	1	1 unit
	Yes	A	3SU1804-0NZ10 K0Y	1	1 unit
6	No	A	3SU1806-0AZ10 K0Y	1	1 unit
	Yes	A	3SU1806-0NZ10 K0Y	1	1 unit

Metal version



1	No	A	3SU1851-0NZ10 K0Y	1	1 unit
2	No	A	3SU1852-0AZ10 K0Y	1	1 unit
	Yes	A	3SU1852-0NZ10 K0Y	1	1 unit
3	No	A	3SU1853-0AZ10K0Y	1	1 unit
	Yes	A	3SU1853-0NZ10 K0Y	1	1 unit
4	No	A	3SU1854-0AZ10 K0Y	1	1 unit
	Yes	A	3SU1854-0NZ10 K0Y	1	1 unit
6	No	A	3SU1856-0AZ10 K0Y	1	1 unit
	Yes	A	3SU1856-0NZ10 K0Y	1	1 unit

¹⁾ The command points and inscription can be configured online via the SIRIUS ACT configurator.
www.siemens.com/sirius-act/configurator

Push Button Units and Indicator Lights

Enclosures

• Revised •
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Modules for enclosures

Selection and ordering data

	Contact version	Number of NO contacts	Number of NC contacts		DT	Screw terminals		PU (UNIT, SET, M)	PS*
Contact modules for base mounting							Order No.		
	Silver alloy	1	0			▶ 3SU1400-2AA10-1BA0		1	1 unit
		0	1			▶ 3SU1400-2AA10-1CA0		1	1 unit
		0	1			▶ 3SU1400-2AA10-1MA0		1	1 unit
									
	Silver alloy	1	0			B ▶ 3SU1400-2AA10-3BA0		1	1 unit
		0	1			B ▶ 3SU1400-2AA10-3CA0		1	1 unit
		0	1			B ▶ 3SU1400-2AA10-3MA0		1	1 unit
									

⊕ Positive opening according to IEC 60947-5-1, Annex K.
Can be used with 3SK11 safety relays or the 3RK3 Modular Safety System;
see page 11/1 onwards.

Certificate: 

	Operational voltage at AC	Operational voltage at DC	Color	DT	Screw terminals		PU (UNIT, SET, M)	PS*
	V	V			Order No.			
LED modules ¹⁾ for base mounting								
 3SU1401-2BB60-1AA0	24	24	Amber	B	3SU1401-2BB00-1AA0		1	1 unit
			Red	▶	3SU1401-2BB20-1AA0		1	1 unit
			Yellow	B	3SU1401-2BB30-1AA0		1	1 unit
			Green	▶	3SU1401-2BB40-1AA0		1	1 unit
			Blue	B	3SU1401-2BB50-1AA0		1	1 unit
			White	▶	3SU1401-2BB60-1AA0		1	1 unit
	110	--	Amber	B	3SU1401-2BC00-1AA0		1	1 unit
			Red	B	3SU1401-2BC20-1AA0		1	1 unit
			Yellow	B	3SU1401-2BC30-1AA0		1	1 unit
			Green	B	3SU1401-2BC40-1AA0		1	1 unit
			Blue	B	3SU1401-2BC50-1AA0		1	1 unit
			White	B	3SU1401-2BC60-1AA0		1	1 unit
	230	--	Amber	B	3SU1401-2BF00-1AA0		1	1 unit
			Red	B	3SU1401-2BF20-1AA0		1	1 unit
			Yellow	B	3SU1401-2BF30-1AA0		1	1 unit
			Green	B	3SU1401-2BF40-1AA0		1	1 unit
			Blue	B	3SU1401-2BF50-1AA0		1	1 unit
			White	B	3SU1401-2BF60-1AA0		1	1 unit

1) Only for use with GIPUHG command and signaling devices.

¹⁾ Only for use with SIRIUS commanding and signaling devices.

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Push Button Units and Indicator Lights

Enclosures

Modules for enclosures

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3SU1401-2BB20-3AA0

Operational voltage at AC	Operational voltage at DC	Color	DT	Spring-type terminals	PU (UNIT, SET, M)	PS*
V	V			Order No.		
LED modules¹⁾ for base mounting						
24	24	Amber	B	3SU1401-2BB00-3AA0	1	1 unit
		Red	▶	3SU1401-2BB20-3AA0	1	1 unit
		Yellow	B	3SU1401-2BB30-3AA0	1	1 unit
		Green	▶	3SU1401-2BB40-3AA0	1	1 unit
		Blue	B	3SU1401-2BB50-3AA0	1	1 unit
		White	▶	3SU1401-2BB60-3AA0	1	1 unit
110	--	Amber	B	3SU1401-2BC00-3AA0	1	1 unit
		Red	B	3SU1401-2BC20-3AA0	1	1 unit
		Yellow	B	3SU1401-2BC30-3AA0	1	1 unit
		Green	B	3SU1401-2BC40-3AA0	1	1 unit
		Blue	B	3SU1401-2BC50-3AA0	1	1 unit
		White	B	3SU1401-2BC60-3AA0	1	1 unit
230	--	Amber	B	3SU1401-2BF00-3AA0	1	1 unit
		Red	B	3SU1401-2BF20-3AA0	1	1 unit
		Yellow	B	3SU1401-2BF30-3AA0	1	1 unit
		Green	B	3SU1401-2BF40-3AA0	1	1 unit
		Blue	B	3SU1401-2BF50-3AA0	1	1 unit
		White	B	3SU1401-2BF60-3AA0	1	1 unit

¹⁾ Only for use with SIRIUS commanding and signaling devices.



3SU1401-2BG60-1AA0

Operational voltage at AC	Operational voltage at DC	Color	DT	Screw terminals	PU (UNIT, SET, M)	PS*
V	V			Order No.		
LED modules¹⁾ for base mounting - wide voltage range						
6 ... 24	6 ... 24	Amber	B	3SU1401-2BG00-1AA0	1	1 unit
		Red	▶	3SU1401-2BG20-1AA0	1	1 unit
		Yellow	B	3SU1401-2BG30-1AA0	1	1 unit
		Green	▶	3SU1401-2BG40-1AA0	1	1 unit
		Blue	▶	3SU1401-2BG50-1AA0	1	1 unit
		White	▶	3SU1401-2BG60-1AA0	1	1 unit
24 ... 230	24 ... 230	Amber	B	3SU1401-2BH00-1AA0	1	1 unit
		Red	B	3SU1401-2BH20-1AA0	1	1 unit
		Yellow	B	3SU1401-2BH30-1AA0	1	1 unit
		Green	B	3SU1401-2BH40-1AA0	1	1 unit
		Blue	B	3SU1401-2BH50-1AA0	1	1 unit
		White	▶	3SU1401-2BH60-1AA0	1	1 unit
6 ... 24	6 ... 24	Amber	B	3SU1401-2BG00-3AA0	1	1 unit
		Red	B	3SU1401-2BG20-3AA0	1	1 unit
		Yellow	B	3SU1401-2BG30-3AA0	1	1 unit
		Green	B	3SU1401-2BG40-3AA0	1	1 unit
		Blue	B	3SU1401-2BG50-3AA0	1	1 unit
		White	B	3SU1401-2BG60-3AA0	1	1 unit
24 ... 230	24 ... 230	Amber	B	3SU1401-2BH00-3AA0	1	1 unit
		Red	B	3SU1401-2BH20-3AA0	1	1 unit
		Yellow	B	3SU1401-2BH30-3AA0	1	1 unit
		Green	B	3SU1401-2BH40-3AA0	1	1 unit
		Blue	B	3SU1401-2BH50-3AA0	1	1 unit
		White	B	3SU1401-2BH60-3AA0	1	1 unit

¹⁾ Only for use with SIRIUS commanding and signaling devices.



3SU1401-1CK10-1AA0




LED test modules¹⁾ for base mounting						
12 ... 240	12 ... 240		▶	3SU1400-2CK10-1AA0	1	1 unit

¹⁾ Only for use with SIRIUS commanding and signaling devices.

Push Button Units and Indicator Lights Enclosures

• Revised •
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Modules for enclosures

	Operational voltage	Slave type	Number of digital inputs		Number of digital outputs	DT	Push-in terminals		PU (UNIT, SET, M)	PS*
			Standard	Safety-related			Order No.			
AS-Interface modules for base mounting										
	30 V	4 DI/3 DO AB	4	0	3	B	3SU1400-2EJ10-6AA0	1	1 unit	
		4 DI/4 DO	4	0	4	B	3SU1400-2EK10-6AA0	1	1 unit	
		2 F-DI	0	2	0	B	3SU1400-2EA10-6AA0	1	1 unit	
		2 F-DI + 1LED	0	2	1	B	3SU1401-2EE20-6AA0	1	1 unit	
						for LED control				
3SU1400-2EJ10-6AA0										
IO-Link modules for base mounting										
	24 V	Freely programmable (default 6 DI/2 DO)	0-8	0	0-8	B	3SU1400-2HL10-6AA0	1	1 unit	
		4 DI/4 DO	4	0	4	B	3SU1400-2HM10-6AA0	1	1 unit	
		6 DI/2 DO	6	0	2	B	3SU1400-2HK10-6AA0	1	1 unit	
		2 DI/6 DO	2	0	6	B	3SU1400-2HN10-6AA0	1	1 unit	
3SU1400-2EJ10-6AA0										

3SU1400-2EJ10-6AA0

Overview

Equipment

The two-hand operation consoles are pre-equipped with commanding devices. In the case of plastic enclosures the command points are equipped as standard with actuators and indicators made of plastic, in the case of metal enclosures they are equipped with actuators and indicators made of metal.

The standard equipment comprises:

- 2 black mushroom pushbuttons, Ø 40 mm, 1 NO + 1 NC
- 1 red EMERGENCY STOP mushroom pushbutton according to ISO 13850, Ø 40 mm, with positive latching, 2 NC

The plastic version can be retrofitted with up to 8 customized command points. The surface of the console has premachined breaking points for this purpose.

Application

The two-hand operation consoles are required for use with machines and systems that have hazardous areas, in order to direct both hands of the operator to one position.

The operation consoles are primarily used on presses, stamping machines, printing presses and paper converting machines, in the chemical industry and in the rubber and plastics industries.





The control command is given by pressing the two mushroom pushbuttons on the sides simultaneously (within 0.5 s of each other) and must be maintained for as long as a hazard exists.

For the further processing of control commands, suitable evaluation units are used, e.g. 3SK11 safety relays or the 3RK3 Modular Safety System.

Standards

The two-hand operation consoles comply with the requirements of EN 574.

Selection and ordering data

Version of actuating element Unlatching method		Color of actuating element	Number of NO contacts	Number of NC contacts	DT	Order No.	PU (UNIT, SET, M)	PS*
Enclosures · Two-hand operation consoles								
	Plastic enclosures							
	None	--	0	0	B	3SU1803-3AA00-1AA1	1	1 unit
	A = mushroom pushbutton, pull-to unlatch mechanism B = EMERGENCY STOP mushroom pushbutton, rotate-to-unlatch mechanism C = mushroom pushbutton, pull-to-unlatch mechanism	A = black B = red C = black	2	4	B	3SU1803-3NB00-1AE1	1	1 unit
	Metal enclosures							
	None	--	0	0	B	3SU1853-3AA00-0AA1	1	1 unit
	A = mushroom pushbutton, pull-to unlatch mechanism B = EMERGENCY STOP mushroom pushbutton, rotate-to-unlatch mechanism C = mushroom pushbutton, pull-to-unlatch mechanism	A = black B = red C = black	2	4	B	3SU1853-3NB00-1AA1	1	1 unit
			2	4	B	3SU1853-3NB00-1AD1	1	1 unit
Version		Material	Color		DT	Order No.	PU (UNIT, SET, M)	PS*
Accessories								
	Stands for two-hand operation console		Metal	Silver	B	3SU1950-0HN10-0AA0	1	1 unit

Insert labels

Overview

Labels can be inserted for identification purposes in pushbuttons (clear) and in illuminated pushbuttons with a flat button. These insert labels are made of semi-transparent plastic with black inscription; they can be fitted in any 90° angle.


Inscription

The inscription is in upper/lower case, all words begin with upper case letters. Graphic symbols, including those not listed in the catalog, are according to ISO 7000 or IEC 60417.

The insert labels without inscription are suitable for user marking with permanent pen.

For customized inscription, see "Options" on page 10/124.

Selection and ordering data

Color	Marking	DT	Order No.	PU (UNIT, SET, M)	PS*
Insert labels					
For self-inscription					
Clear/Black (label/lettering)	None	B	3SU1900-0AB71-0AA0	100	10 units
For customized inscription					
Clear/Black (label/lettering)	None	B	3SU1900-0AB71-0AZ0	100	10 units
Inscription in English					
 <p>3SU1900-0AB71-0DN0</p>	Clear/Black (label/lettering)	On	B	3SU1900-0AB71-0DJ0	100 10 units
		Off	B	3SU1900-0AB71-0DK0	100 10 units
		Up	B	3SU1900-0AB71-0DL0	100 10 units
		Down	B	3SU1900-0AB71-0DM0	100 10 units
		Forward+	B	3SU1900-0AB71-0DN0	100 10 units
		Right	B	3SU1900-0AB71-0DQ0	100 10 units
		Left	B	3SU1900-0AB71-0DR0	100 10 units
		Stop	B	3SU1900-0AB71-0DS0	100 10 units
		Start	B	3SU1900-0AB71-0DT0	100 10 units
		Reset	B	3SU1900-0AB71-0DU0	100 10 units
		Test	B	3SU1900-0AB71-0DV0	100 10 units
		Open	B	3SU1900-0AB71-0DW0	100 10 units
		Close	B	3SU1900-0AB71-0DX0	100 10 units
		Running	B	3SU1900-0AB71-0EB0	100 10 units
		Fast	B	3SU1900-0AB71-0EE0	100 10 units
		Slow	B	3SU1900-0AB71-0EF0	100 10 units

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Push Button Units and Indicator Lights

Labels

Insert labels

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Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
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Insert labels

With symbol (ON/OFF)

Black/White (label/lettering)	O I	--	B	3SU1900-0AB16-QQE0	1	10 units
White/Black (label/lettering)	O I	--	B	3SU1900-0AB61-QQE0	1	10 units
Clear/Black (label/lettering)	O	5008 IEC	A	3SU1900-0AB71-QQA0	100	10 units
	I	5007 IEC	A	3SU1900-0AB71-QQB0	100	10 units
	II	--	B	3SU1900-0AB71-QQC0	100	10 units
	III	--	B	3SU1900-0AB71-QQD0	100	10 units

3SU1900-0AB71-QQC0

With symbol (graphic)

Clear/Black (label/lettering)	→	ARROW DIRECTION TO RIGHT	5022 IEC	A	3SU1900-0AB71-QQR0	100	10 units
	↗	ARROW DIRECTION UP	--	B	3SU1900-0AB71-QQS0	100	10 units
	↻	CLOCKWISE ROTATION	0004 ISO	B	3SU1900-0AB71-QQT0	100	10 units
	↺	COUNTERCLOCKWISE ROTATION	--	B	3SU1900-0AB71-QQU0	100	10 units
	⚡	RAPID TRAVERSE	0266 ISO	B	3SU1900-0AB71-QQV0	100	10 units
	⚡	FEED	--	B	3SU1900-0AB71-QQW0	100	10 units
	+	INCREASE, PLUS	5005 IEC	B	3SU1900-0AB71-QQX0	100	10 units
	-	DECREASE, MINUS	5006 IEC	B	3SU1900-0AB71-QQY0	100	10 units
	⚡	ELECTRIC MOTOR	0011 ISO	B	3SU1900-0AB71-QRA0	100	10 units
	⚡	HORN	5014 IEC	B	3SU1900-0AB71-ORB0	100	10 units
	⚡	WATER TAP	--	B	3SU1900-0AB71-ORC0	100	10 units
	⚡	PUMP	0134 ISO	B	3SU1900-0AB71-ORD0	100	10 units
	⚡	COOLANT PUMP	0355 ISO	B	3SU1900-0AB71-ORE0	100	10 units
	⚡	LOCK, TIGHTEN	--	B	3SU1900-0AB71-ORF0	100	10 units
	⚡	UNLOCK, UNCLAMP	--	B	3SU1900-0AB71-ORG0	100	10 units
	⚡	BRAKE	--	B	3SU1900-0AB71-ORH0	100	10 units
	⚡	RELEASE BRAKE	0021 ISO	B	3SU1900-0AB71-ORJ0	100	10 units
	⚡	INTERLOCK	0022 ISO	B	3SU1900-0AB71-ORK0	100	10 units
	⚡	UNLOCK	0023 ISO	B	3SU1900-0AB71-ORL0	100	10 units
	⚡	SETTING	--	B	3SU1900-0AB71-ORM0	100	10 units
	⚡	ON-OFF MOMENTARY CONTACT TYPE	5011 IEC	B	3SU1900-0AB71-ORN0	100	10 units
	⚡	MANUAL OPERATION	0096 ISO	B	3SU1900-0AB71-ORP0	100	10 units
	⚡	AUTOMATIC CYCLE	0017 ISO	B	3SU1900-0AB71-ORQ0	100	10 units
	⚡	SUCTION	--	B	3SU1900-0AB71-ORR0	100	10 units
	⚡	BLOWING	--	B	3SU1900-0AB71-ORS0	100	10 units

3SU1900-0AB71-QQT0

3SU1900-0AB71-ORB0

3SU1900-0AB71-ORN0

Insert labels

Options

Customized inscriptions

The labels can be inscribed with text and symbols not listed in the ordering data.

By default, a letter height of 4 mm (for a single line of text) or 3 mm (for two or three lines of text) is used for text inscriptions.

The typeface used is Arial. Other letter heights and typefaces are possible, but must be specified when ordering.

For round insert labels, the maximum possible number of characters per line is:

- 10 characters for one line of text
- 8 characters for 2 lines of text
- 6 characters for 3 lines of text, but 10 characters in the middle line

Examples for customized inscription



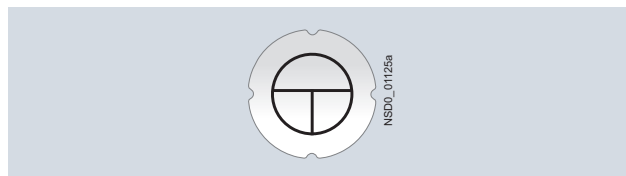
Two-line inscription in upper/lower case lettering (Q0Y)



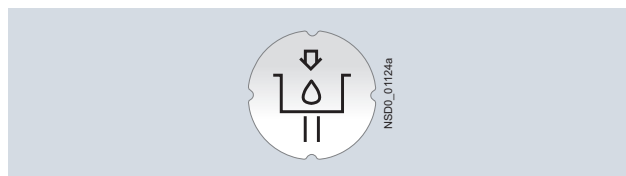
Single-line inscription in upper case lettering (Q1Y)



Three-line inscription in lower case letters (Q2Y)



Symbol number 5011 according to IEC 60417 (Q3Y)



Any symbol according to order form supplement (Q9Y)

Ordering notes

Append the following order codes to the Order No.:

- Text line(s) in upper/lower case, upper case always for beginning of line (e.g. "Lift / Off"): **Q0Y**
- Text line(s) in upper case (e.g. "LIFT"): **Q1Y**
- Text line(s) in lower case (e.g. "lift / off / lower"): **Q2Y**
- Text line(s) in upper/lower case, all words begin with upper case letters (e.g. "On Off"): **Q5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **Q3Y**
- Any inscription or symbol according to order form supplement: **Q9Y**

When ordering, specify the required inscription in plain text in addition to the article number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language. In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 = Lower". For long words you can also specify the end-of-line division; see [ordering example 1](#)

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417; see [ordering examples 2 and 3](#)

The SIRIUS ACT Configurator must be used to select customized inscriptions and symbols (order code Q9Y).

In this case a "CIN" (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mail shopping cart) or via the standard order channels.

Standard ordering channels:

- Configurator: www.siemens.com/sirius-act/configurator
- Electronic Catalog CA 01 on DVD
- Industry Mall: www.usa.siemens.com/industrymall

Ordering example 1

A label with 2 lines of text is required:

3SU1900-0AB71-0AZ0

Q1Y

Z1 = LIFT

Z2 = LOWER

Ordering example 2

A label inscribed with symbol No. 5011 according to IEC 60417 is required:

3SU1900-0AB71-0AZ0

Q3Y

Z = 5011 IEC

Ordering example 3

A label inscribed with symbol No. 1118 according to ISO 7000 is required:

3SU1900-0AB71-0AZ0

Q3Y

Z = 1118 ISO

Label holders for labeling plates

Selection and ordering data

	Label holder shape	Label holder color	Label fastening method	Labeling plate size		DT	Order No.	PU (UNIT, SET, M)	PS*
				Height	Width				
				mm	mm				
Label holders for labeling plates									
	With rounded bottom	Black	Self-adhesive	12.5	27	▶	3SU1900-0AG10-0AA0 3SU1900-0AH10-0AA0 3SU1900-0AJ10-0AA0 3SU1900-0AR10-0AA0 3SU1900-0AS10-0AA0 3SU1900-0AT10-0AA0	100	10 units
				17.5	27	A		100	10 units
				27	27	▶		100	10 units
	Snap-on	12.5	27	A	100	10 units			
		17.5	27	A	100	10 units			
		27	27	A	100	10 units			
3SU1900-0AG10-0AA0									
	With square bottom	Black	Self-adhesive	12.5	27	B	3SU1900-0AN10-0AA0 3SU1900-0AP10-0AA0 3SU1900-0AQ10-0AA0	100	1 unit
				17.5	27	B		100	1 unit
				27	27	B		100	1 unit
	3SU1900-0AN10-0AA0								
Label holders for labeling plates for coordinate switches									
	With square bottom	Black	Self-adhesive	27	27	A	3SU1900-0AL10-0AA0	1	1 unit
3SU1900-0AL10-0AA0									
	Cross	Black	Self-adhesive	27	27	B	3SU1900-0AM10-0AA0	1	1 unit
3SU1900-0AM10-0AA0									
Label holders for labeling plates for twin pushbuttons									
	Rectangular	Black	Self-adhesive	12.5	27	▶	3SU1900-0AK10-0AA0	100	10 units
3SU1900-0AK10-0AA0									
Single frames									
	Square	--	--	29.8	29.8	A	3SU1900-0AX10-0AA0	1	10 units
3SU1900-0AX10-0AA0									

Labeling plates

Overview

The backing plates consist of a black molded-plastic label holder and a labeling plate (black with white print or silver-colored with black print) for sticking or snapping in place. They are not suitable for EMERGENCY STOP buttons. Note mounting dimensions!

Inscription

The inscription is in upper/lower case, all words begin with upper case letters. Graphic symbols, including those not listed in the catalog, are according to ISO 7000 or IEC 60417.

For customized inscription, see "Options" on page 10/131.




Labeling plates for sticking/snapping in place

The labels are available in three sizes:




- 12.5 mm × 27 mm
- 17.5 mm × 27 mm
- 27 mm × 27 mm

For mounting the labeling plates, you can choose between label holders for stick-on or snap-on mounting.

Selection and ordering data

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates 12.5 mm x 27 mm						
For self-inscription						
	Black/White (label/lettering)	None	--	▶ 3SU1900-0AC16-0AA0	100	10 units
	Black/White (label/lettering)	None	--	▶ 3SU1900-0AB71-0AZ0	100	10 units
Inscription in English						
	Black/White (label/lettering)	On	--	B 3SU1900-0AC16-0DJ0	100	10 units
		Off	--	B 3SU1900-0AC16-0DK0	100	10 units
		Up	--	B 3SU1900-0AC16-0DL0	100	10 units
		Down	--	B 3SU1900-0AC16-0DM0	100	10 units
		Forward	--	▶ 3SU1900-0AC16-0DN0	100	10 units
		Reverse	--	B 3SU1900-0AC16-0DP0	100	10 units
		Right	--	B 3SU1900-0AC16-0DQ0	100	10 units
		Left	--	B 3SU1900-0AC16-0DR0	100	10 units
		Stop	--	▶ 3SU1900-0AC16-0DS0	100	10 units
		Start	--	▶ 3SU1900-0AC16-0DT0	100	10 units
		Reset	--	B 3SU1900-0AC16-0DU0	100	10 units
		Test	--	B 3SU1900-0AC16-0DV0	100	10 units
		Open	--	▶ 3SU1900-0AC16-0DW0	100	10 units
		Close	--	▶ 3SU1900-0AC16-0DX0	100	10 units
		Jog	--	B 3SU1900-0AC16-0DE0	100	10 units
		Running	--	B 3SU1900-0AC16-0EB0	100	10 units
		Fault	--	B 3SU1900-0AC16-0EC0	100	10 units
		Run	--	B 3SU1900-0AC16-0ED0	100	10 units
		Stop Start	--	B 3SU1900-0AC16-0DC0	100	10 units
		Off On	--	▶ 3SU1900-0AC16-0DH0	100	10 units
		Power off	--	B 3SU1900-0AC16-0DF0	100	10 units
		Power on	--	B 3SU1900-0AC16-0DG0	100	10 units
		Man O Auto	--	B 3SU1900-0AC16-0DY0	100	10 units
		Man Auto	--	B 3SU1900-0AC16-0EA0	100	10 units
		Hand Auto	--	B 3SU1900-0AC16-0DB0	100	10 units
		Hand O Auto	--	B 3SU1900-0AC16-0DD0	100	10 units
With symbol						
	Black/White (label/lettering)	O	--	B 3SU1900-0AC16-0QA0	100	10 units
		I	--	B 3SU1900-0AC16-0QB0	100	10 units
		O I	--	B 3SU1900-0AC16-0QG0	100	10 units
		1 2	--	B 3SU1900-0AC16-0QJ0	100	10 units
		↑ ARROW DIRECTION UP	--	B 3SU1900-0AC16-0QS0	100	10 units

Labeling plates

	Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates 12.5 mm x 27 mm							
	For self-inscription						
	Silver/Black (label/lettering)	None		A	3SU1900-0AC81-0AA0	100	10 units
	For custom inscription						
	Silver/Black (label/lettering)	None		A	3SU1900-0AC81-0AZ0	100	10 units
	Inscription in English						
	Silver/Black (label/lettering)	On	--	B	3SU1900-0AC81-0DJ0	100	10 units
		Off	--	B	3SU1900-0AC81-0DK0	100	10 units
		Up	--	B	3SU1900-0AC81-0DL0	100	10 units
		Down	--	B	3SU1900-0AC81-0DM0	100	10 units
		Stop	--	B	3SU1900-0AC81-0DS0	100	10 units
		Start	--	B	3SU1900-0AC81-0DT0	100	10 units
		Reset	--	B	3SU1900-0AC81-0DU0	100	10 units
		Test	--	B	3SU1900-0AC81-0DV0	100	10 units
		Open	--	B	3SU1900-0AC81-0DW0	100	10 units
		Close	--	B	3SU1900-0AC81-0DX0	100	10 units
		Man O Auto	--	B	3SU1900-0AC81-0DY0	100	10 units
		Man Auto	--	B	3SU1900-0AC81-0EA0	100	10 units
		Running	--	B	3SU1900-0AC81-0EB0	100	10 units
		Fault	--	B	3SU1900-0AC81-0EC0	100	10 units
		Fast	--	B	3SU1900-0AC81-0EE0	100	10 units
		Slow	--	B	3SU1900-0AC81-0EF0	100	10 units
		Hand Auto	--	B	3SU1900-0AC81-0DB0	100	10 units
		Stop Start	--	B	3SU1900-0AC81-0DC0	100	10 units
		Hand O Auto	--	B	3SU1900-0AC81-0DD0	100	10 units
	With symbol						
	Silver/Black (label/lettering)	O	5008 IEC	B	3SU1900-0AC81-0QA0	100	10 units
		I	5007 IEC	B	3SU1900-0AC81-0QB0	100	10 units
		II	--	B	3SU1900-0AC81-0QC0	100	10 units
		III	--	B	3SU1900-0AC81-0QD0	100	10 units
		O I	--	B	3SU1900-0AC81-0QG0	100	10 units
		I O II	--	B	3SU1900-0AC81-0QK0	100	10 units
		I O 2	--	B	3SU1900-0AC81-0QL0	100	10 units
		→ ARROW DIRECTION TO RIGHT	5022 IEC	B	3SU1900-0AC81-0QR0	100	10 units
		↑ ARROW DIRECTION UP	--	B	3SU1900-0AC81-0QS0	100	10 units

Labeling plates

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates 17.5 mm x 27 mm						
For self-inscription						
	Black/White (label/lettering)	None	--	▶ 3SU1900-0AD16-0AA0	100	10 units
	For custom inscription					
	Black/White (label/lettering)	None	--	▶ 3SU1900-0AD16-0AZ0	100	10 units
Inscription in English						
	Black/White (label/lettering)	Stop Start	--	B 3SU1900-0AD16-0DC0	100	10 units
		On	--	B 3SU1900-0AD16-0DJ0	100	10 units
		Off	--	B 3SU1900-0AD16-0DK0	100	10 units
		Up	--	B 3SU1900-0AD16-0DL0	100	10 units
		Down	--	B 3SU1900-0AD16-0DM0	100	10 units
		Forward	--	B 3SU1900-0AD16-0DN0	100	10 units
		Reverse	--	B 3SU1900-0AD16-0DP0	100	10 units
		Right	--	B 3SU1900-0AD16-0DQ0	100	10 units
		Stop	--	B 3SU1900-0AD16-0DS0	100	10 units
		Start	--	B 3SU1900-0AD16-0DT0	100	10 units
		Open	--	B 3SU1900-0AD16-0DW0	100	10 units
		Close	--	B 3SU1900-0AD16-0DX0	100	10 units
		Man Auto	--	B 3SU1900-0AD16-0EA0	100	10 units
		Running	--	B 3SU1900-0AD16-0EB0	100	10 units
		Fault	--	B 3SU1900-0AD16-0EC0	100	10 units
		Hand Auto	--	B 3SU1900-0AD16-0DB0	100	10 units
With symbol						
	Black/White (label/lettering)	O	5008 IEC	B 3SU1900-0AD16-0QA0	100	10 units
		I	5007 IEC	B 3SU1900-0AD16-0QB0	100	10 units
		O I	--	B 3SU1900-0AD16-0QG0	100	10 units
		→ ARROW DIRECTION TO RIGHT	5022 IEC	B 3SU1900-0AD16-0QR0	100	10 units
		↑ ARROW DIRECTION UP	--	B 3SU1900-0AD16-0QS0	100	10 units

• Revised •
08/31/15

Push Button Units and Indicator Lights

Labels

Labeling plates

1
2
3
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10

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
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Labeling plates 17.5 mm x 27 mm

For self-inscription



3SU1900-0AD81-0AA0

Silver/Black (label/lettering)	None	--	A	3SU1900-0AD81-0AA0	100	10 units
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For custom inscription

Silver/Black (label/lettering)	None	--	A	3SU1900-0AD81-0AZ0	100	10 units
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Inscription in English



3SU1900-0AD81-0EC0

Silver/Black (label/lettering)	On	--	B	3SU1900-0AD81-0DJ0	100	10 units
	Off	--	B	3SU1900-0AD81-0DK0	100	10 units
	Stop	--	B	3SU1900-0AD81-0DS0	100	10 units
	Start	--	B	3SU1900-0AD81-0DT0	100	10 units
	Reset	--	B	3SU1900-0AD81-0DU0	100	10 units
	Man O Auto	--	B	3SU1900-0AD81-0DY0	100	10 units
	Fault	--	B	3SU1900-0AD81-0EC0	100	10 units
	Hand Auto	--	B	3SU1900-0AD81-0DB0	100	10 units
	Hand O Auto	--	B	3SU1900-0AD81-0DD0	100	10 units






With symbol



3SU1900-0AD81-0QG0

Silver/Black (label/lettering)	O	5008 IEC	B	3SU1900-0AD81-0QA0	100	10 units	
	I	5007 IEC	B	3SU1900-0AD81-0QB0	100	10 units	
	O I	--	B	3SU1900-0AD81-0QG0	100	10 units	
	I O II	--	B	3SU1900-0AD81-0QK0	100	10 units	
	1 O 2	--	B	3SU1900-0AD81-0QL0	100	10 units	
	→	ARROW DIRECTION TO RIGHT	5022 IEC	B	3SU1900-0AD81-0QR0	100	10 units
	↑	ARROW DIRECTION UP	--	B	3SU1900-0AD81-0QS0	100	10 units

Labeling plates

	Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates 27 mm x 27 mm							
	For self-inscription						
	Black/White (label/lettering)	None	--	▶	3SU1900-0AE16-0AA0	100	10 units
	For custom inscription						
	Black/White (label/lettering)	None	--	▶	3SU1900-0AE16-0AZ0	100	10 units
	For self-inscription			A	3SU1900-0AE81-0AA0	100	10 units
	For custom inscription			A	3SU1900-0AE81-0AZ0	100	10 units
	Inscription in English						
	Black/White (label/lettering)	On	--	B	3SU1900-0AE16-0DJ0	100	10 units
		Off	--	B	3SU1900-0AE16-0DK0	100	10 units
		Up	--	B	3SU1900-0AE16-0DL0	100	10 units
		Down	--	B	3SU1900-0AE16-0DM0	100	10 units
		Forward	--	B	3SU1900-0AE16-0DN0	100	10 units
		Reverse	--	B	3SU1900-0AE16-0DP0	100	10 units
		Stop	--	B	3SU1900-0AE16-0DS0	100	10 units
		Start	--	B	3SU1900-0AE16-0DT0	100	10 units
		EMERGENCY STOP	--	B	3SU1900-0AE16-0DA0	100	10 units
		Stop Start	--	B	3SU1900-0AE16-0DC0	100	10 units
		Hand Auto	--	B	3SU1900-0AE16-0DB0	100	10 units
	With symbol						
	Black/White (label/lettering)	O I	--	B	3SU1900-0AE16-0QG0	100	10 units
		→ ARROW DIRECTION TO RIGHT	5022 IEC	B	3SU1900-0AE16-0QR0	100	10 units

Options

Customized inscriptions

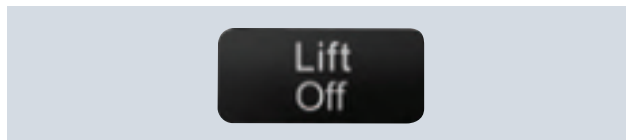
The labels can be inscribed with text and symbols not listed in the ordering data.

The following letter heights are used as standard for text inscriptions:

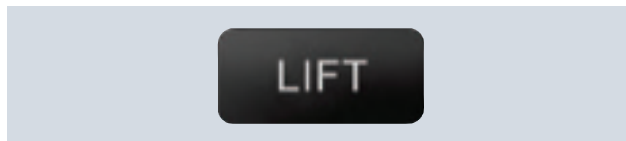
- Label size 12.5 mm × 27 mm: 3 lines with letter height 4 mm (1-line), 3.5 mm (2-line) or 2.5 mm (3-line)
- Label size 17.5 mm × 27 mm: 3 lines with letter height 4 mm (1- to 2-line) or 3 mm (3-line)
- Label size 27 mm × 27 mm: 5 lines with letter height 4 mm (1- to 5-line)

Up to 11 characters per line are possible. The typeface used is Arial. Other letter heights and typefaces are possible, but must be specified when ordering.

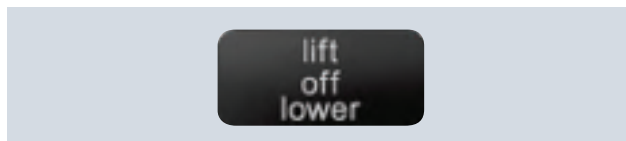
Examples for customized inscription



Two-line inscription in upper/lower case lettering (Q0Y)



Single-line inscription in upper case lettering (Q1Y)



Three-line inscription in lower case letters (Q2Y)



Symbol number 5011 according to IEC 60417 (Q3Y)



Any symbol according to order form supplement (Q9Y)

Ordering notes

Append the following order codes to the Order No.:

- Text line(s) in upper/lower case, upper case always for beginning of line (e.g. "Lift / Off"): **Q0Y**
- Text line(s) in upper case (e.g. "LIFT"): **Q1Y**
- Text line(s) in lower case (e.g. "lift / off / lower"): **Q2Y**
- Text line(s) in upper/lower case, all words begin with upper case letters (e.g. "On Off"): **Q5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **Q3Y**
- Any inscription or symbol according to order form supplement: **Q9Y**

When ordering, specify the required inscription in plain text in addition to the article number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language.

In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 = Lower".

For long words you can also specify the end-of-line division; see [ordering example 1](#)

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417; see [ordering examples 2 and 3](#)

For special symbols (order code Q9Y), a CAD drawing in BMP, GIF, JPEG, PDF, PNG or TIFF format must be submitted. For special inscriptions (order code Q9Y): document in DOC or XLS format.

The SIRIUS ACT Configurator must be used to select special inscriptions and symbols (order code Q9Y). In this case a "CIN" (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mall shopping cart) or via the standard order channels.

Standard ordering channels:

- Configurator: www.siemens.com/sirius-act/configurator
- Electronic Catalog CA 01 on DVD
- Industry Mall: www.usa.siemens.com/industrymall

Ordering example 1

A label with 2 lines of text is required:

3SU1900-0AC16-0AZ0

Q1Y

Z1 = LIFT

Z2 = LOWER

Ordering example 2

A label inscribed with symbol No. 5011 according to IEC 60417 is required:

3SU1900-0AC16-0AZ0

Q3Y

Z = 5011 IEC

Ordering example 3

A label inscribed with symbol No. 1118 according to ISO 7000 is required:

3SU1900-0AC16-0AZ0

Q3Y

Z = 1118 ISO

Labeling plates for enclosures

Overview

The labeling plates in size 22 mm x 22 mm can be attached to enclosures with cutouts for labels. There are versions in black with white print or silver-colored with black print.

Inscription

The inscription is in upper/lower case, all words begin with upper case letters. Graphic symbols, including those not listed in the catalog, are according to ISO 7000 or IEC 60417.

For customized inscription, see "Options" on page 10/134.

Selection and ordering data

Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates 22 mm x 22 mm						
For self-inscription						
Black/White (label/lettering)	None	--	▶	3SU1900-0AF16-0AA0	100	10 units
For custom inscription						
Black/White (label/lettering)	None	--	▶	3SU1900-0AF16-0AZ0	100	10 units
Inscription in English						
Black/White (label/lettering)	On	--	B	3SU1900-0AF16-0DJ0	1	10 units
	Off	--	B	3SU1900-0AF16-0DK0	1	10 units
	Up	--	▶	3SU1900-0AF16-0DL0	1	10 units
	Down	--	▶	3SU1900-0AF16-0DM0	1	10 units
	Forward	--	B	3SU1900-0AF16-0DN0	1	10 units
	Right	--	B	3SU1900-0AF16-0DQ0	1	10 units
	Left	--	B	3SU1900-0AF16-0DR0	1	10 units
	Stop	--	▶	3SU1900-0AF16-0DS0	1	10 units
	Start	--	▶	3SU1900-0AF16-0DT0	1	10 units
	Reset	--	B	3SU1900-0AF16-0DU0	1	10 units
	Test	--	▶	3SU1900-0AF16-0DV0	1	10 units
	Open	--	B	3SU1900-0AF16-0DW0	1	10 units
	Close	--	B	3SU1900-0AF16-0DX0	1	10 units
	Running	--	B	3SU1900-0AF16-0EB0	1	10 units
	Fault	--	B	3SU1900-0AF16-0EC0	1	10 units
	Fast	--	B	3SU1900-0AF16-0EE0	1	10 units
	Slow	--	B	3SU1900-0AF16-0EF0	1	10 units
	EMERGENCY STOP	--	▶	3SU1900-0AF16-0DA0	1	10 units
With symbol (ON/OFF)						
Black/White (label/lettering)	O	5008 IEC	▶	3SU1900-0AF16-0QA0	1	10 units
	I	5007 IEC	▶	3SU1900-0AF16-0QB0	1	10 units
	II	--	▶	3SU1900-0AF16-0QC0	1	10 units
	III	--	B	3SU1900-0AF16-0QD0	1	10 units
	O I	--	B	3SU1900-0AF16-0QG0	1	10 units
	I O II	--	B	3SU1900-0AF16-0QK0	1	10 units
	I O (one below the other)	--	B	3SU1900-0AF16-0QP0	1	10 units
	II O I (one below the other)	--	B	3SU1900-0AF16-0QQ0	1	10 units
With symbol (graphic)						
Black/White (label/lettering)	→ ARROW DIRECTION TO RIGHT	5022 IEC	▶	3SU1900-0AF16-0QR0	1	10 units
	PUMP	0134 ISO	B	3SU1900-0AF16-0RD0	1	10 units
	FAN	--	B	3SU1900-0AF16-0RV0	1	10 units
	COOLING	--	B	3SU1900-0AF16-0RW0	1	10 units
	ILLUMINATION	--	B	3SU1900-0AF16-0RX0	1	10 units
	MOTOR	--	B	3SU1900-0AF16-0RY0	1	10 units

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Push Button Units and Indicator Lights

Labels

Labeling plates for enclosures

1

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Color	Marking	Symbol No.	DT	Order No.	PU (UNIT, SET, M)	PS*
-------	---------	------------	----	-----------	-------------------------	-----

Labeling plates 22 mm x 22 mm

For self-inscription

Silver/Black
(label/lettering)

--

A

3SU1900-0AF81-0AA0

100

10 units

For custom inscription

Silver/Black
(label/lettering)

--

A

3SU1900-0AF81-0AZ0

100

10 units



3SU1900-0AF81-0AA0



3SU1900-0AF81-0DU0



3SU1900-0AF81-0DD0

Inscription in English

Silver/Black
(label/lettering)

Stop

--

B

3SU1900-0AF81-0DS0

1

10 units

Start

--

B

3SU1900-0AF81-0DT0

1

10 units

Reset

--

B

3SU1900-0AF81-0DU0

1

10 units

Test

--

B

3SU1900-0AF81-0DV0

1

10 units

Open

--

B

3SU1900-0AF81-0DW0

1

10 units

Hand O Auto

--

B

3SU1900-0AF81-0DD0

1

10 units

With symbol (ON/OFF)

Silver/Black
(label/lettering)

O

5008 IEC

B

3SU1900-0AF81-0QA0

1

10 units

I

5007 IEC

B

3SU1900-0AF81-0QB0

1

10 units

II

--

B

3SU1900-0AF81-0QC0

1

10 units

III

--

B

3SU1900-0AF81-0QD0

1

10 units

O I

--

B

3SU1900-0AF81-0QG0

1

10 units

I O II

--

B

3SU1900-0AF81-0QK0

1

10 units

I O

--

B

3SU1900-0AF81-0QP0

1

10 units

(one below the other)

II O I

--

B

3SU1900-0AF81-0QQ0

1

10 units

(one below the other)



3SU1900-0AF81-QK0

With symbol (graphic)

Silver/Black
(label/lettering)



ARROW DIRECTION
TO RIGHT

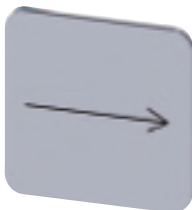
5022 IEC

B

3SU1900-0AF81-0QR0

1

10 units



3SU1900-0AF81-0QR0

Labeling plates for enclosures

Options

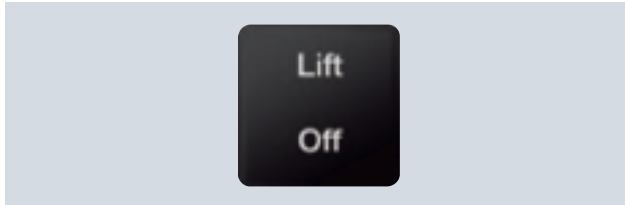
Customized inscriptions

The labels can be inscribed with texts and symbols not listed in the ordering data.

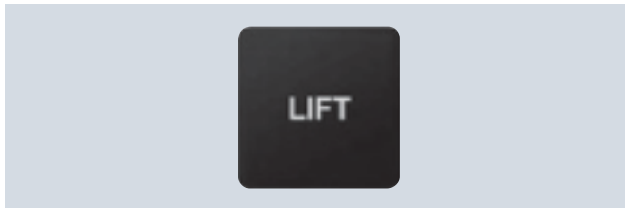
A letter height of 4 mm is used for text inscriptions (1 to 3 lines).

Up to 11 characters per line are possible. The typeface used is Arial. Other letter heights and typefaces are possible, but must be specified when ordering.

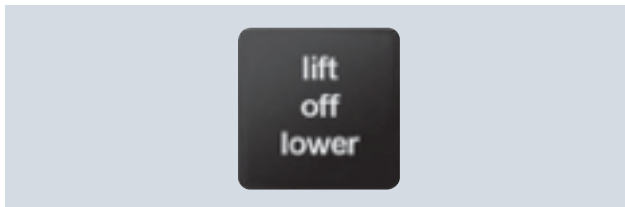
Examples for customized inscription



Two-line inscription in upper/lower case lettering (Q0Y)



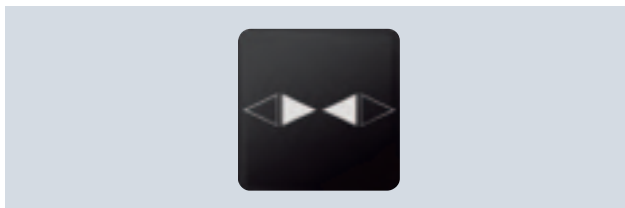
Single-line inscription in upper case lettering (Q1Y)



3SB39 backing plate for enclosures, customized inscription (Q2Y)



Symbol number 5011 according to IEC 60417 (Q3Y)



Any symbol according to order form supplement (Q9Y)

Ordering notes

Append the following order codes to the Order No.:

- Text line(s) in upper/lower case, upper case always for beginning of line (e.g. "Lift / Off"): **Q0Y**
- Text line(s) in upper case (e.g. "LIFT"): **Q1Y**
- Text line(s) in lower case (e.g. "lift / off / lower"): **Q2Y**
- Text line(s) in upper/lower case, all words begin with upper case letters (e.g. "On Off"): **Q5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **Q3Y**
- Any inscription or symbol according to order form supplement: **Q9Y**

When ordering, specify the required inscription in plain text in addition to the article number and order code. In the case of special inscriptions with words in languages other than German, give the exact spelling and specify the language.

In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 = Lower". For long words you can also specify the end-of-line division (see ordering example 1).

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417 (see ordering examples 2 and 3).

For special symbols (order code Q9Y), a CAD drawing in DXF format can be submitted.

The SIRIUS ACT Configurator must be used to select special inscriptions and symbols (order code Q9Y). In this case a "CIN" (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mall shopping cart) or via the standard order channels.

Standard ordering channels:

- Configurator: www.siemens.com/sirius-act/configurator
- Electronic Catalog CA 01 on DVD
- Industry Mall: www.usa.siemens.com/industrymall

Ordering example 1

A label with 2 lines of text is required:

3SU1900-0AF16-0AZ0

Q1Y

Z1 = LIFT

Z2 = LOWER

Ordering example 2

A label inscribed with symbol No. 5011 according to IEC 60417 is required:

3SU1900-0AF16-0AZ0

Q3Y

Z = 5011 IEC

Ordering example 3

A label inscribed with symbol No. 1118 according to ISO 7000 is required:

3SU1900-0AF16-0AZ0

Q3Y

Z = 1118 ISO

Overview

Label inscriptions



Using the *Label Designer* software, which can be downloaded from the Internet, and the labeling plates for laser inscription you can create your own customized labels with a standard laser printer. The self-adhesive or snap-on labels can be stuck or snapped onto the corresponding label holders. Round labels are provided for inserting in illuminated pushbuttons and switches.

The labels are suitable for inscription with one to three lines of text or symbols.

For applications with more exacting requirements we recommend factory-printed labeling plates and insert labels (laser-printed or engraved depending on the type).



For the *Label Designer* software see:
www.siemens.com/sirius-label-designer

Selection and ordering data

Fastening method	Height mm	Width mm	DT	Order No.	PU (UNIT, SET, M)	PS*
Labels for printing - insert labels						
 3SU1900-0BH60-0AA0	Insert	--	--	B	3SU1900-0BH60-0AA0	100 480 units
Labels for printing - labeling plates						
 3SU1900-0BJ61-0AA0	Self-adhesive	12.5	27.5	A	3SU1900-0BJ61-0AA0	100 480 units
		17.5	27	A	3SU1900-0BK61-0AA0	100 720 units
		27	27	A	3SU1900-0BL61-0AA0	100 480 units
		22	22	A	3SU1900-0BM61-0AA0	100 700 units

Other labels

Selection and ordering data

	Color	Fastening method	Outer diameter mm	Marking	DT	Order No.	PU (UNIT, SET, M)	PS*	
EMERGENCY STOP backing plates									
	Yellow/Black (label/lettering)	None	45	None	A	3SU1900-0BA31-0AA0	1	10 units	
			75	None	A	3SU1900-0BB31-0AA0	1	10 units	
			75	EMERGENCY STOP	A	3SU1900-0BB31-0DA0	1	10 units	
For Custom Inscription									
For inscription or symbol options refer to page 112									
						3SU1900-0AB31-0AZ0			
						3SU1900-0BB31-0AZ0			
EMERGENCY STOP backing plates									
	Yellow/Black (label/lettering)	Self-adhesive	75	None	▶	3SU1900-0BC31-0AA0	1	10 units	
				EMERGENCY STOP	▶	3SU1900-0BC31-0DA0	1	10 units	
3SU1900-0BC31-0DA0									
				NOT-HALT, EMERGENCY STOP, EMERGENZA, EMERGENCIA (de, en, it, sp)	A	3SU1900-0BC31-0NB0	1	10 units	
For Custom Inscription									
For inscription or symbol options refer to page 112									
						3SU1900-0BC31-0AZ0			
Labeling plates for potentiometers									
	Black/White (label/lettering)	None	40	--	A	3SU1900-0BG16-0AA0	1	10 units	
				SYMBOL: 0 ... 9	B	3SU1900-0BG16-0RT0	1	10 units	
				SYMBOL: Power up	B	3SU1900-0BG16-0RU0	1	10 units	
3SU1900-0BG16-0RU0									
	Color	Label fastening method	Height mm	Width mm	Marking	DT	Order No.	PU (UNIT, SET, M)	PS*
Labeling plates for enclosures with EMERGENCY STOP									
	Yellow/Black (label/lettering)	Self-adhesive	38	150	None	A	3SU1900-0BE31-0AA0	1	10 units
Labeling plates for enclosures with EMERGENCY STOP with recess									
	Yellow/Black (label/lettering)	Self-adhesive	38	150	None	B	3SU1900-0BF31-0AA0	1	10 units
Unit labeling plates									
	White/Black (label/lettering)	Insert	9.5	10.5	None	B	3SU1900-0AY61-0AA0	100	10 units
3SU1900-0BY61-0AA0									

Options

Customized inscriptions

The labels can be inscribed with text and symbols not listed in the ordering data.

The emergency stop backing plates are divided into four segments. Each segment can be customized individually. The letter height depends on the chosen number of characters and can be adjusted.

Example: Four segments of the emergency backing plate for customized inscription



Ordering notes

Append the following order codes to the Order No.:

- Text line(s) in upper/lower case, upper case always for beginning of line (e.g. "Text"): **Q0Y**
- Text line(s) in upper case (e.g. "TEXT"): **Q1Y**
- Text line(s) in lower case (e.g. "text"): **Q2Y**
- Text line(s) in upper/lower case, all words begin with

- uppercase letters (e.g. "Text / Text"): **Q5Y**
- Symbol with number according to ISO 7000 or IEC 60417: **Q3Y**

When ordering, specify the required inscription in plain text in addition to the article number and order code. In the case of special inscriptions with words in languages other than English, give the exact spelling and specify the language. In the case of multi-line inscriptions, the text must be assigned to the respective line, e.g. "Z1 = Lift, Z2 = Lower". For long words you can also specify the end-of-line division ([see ordering example 1](#)).

Symbols can also be ordered with numbers according to ISO 7000 or IEC 60417; ([see ordering example 2](#)).

The SIRIUS ACT Configurator must be used to select customized inscriptions and symbols (order code **Q9Y**). In this case a "CIN" (Configuration Identification Number) is generated for placement of future orders. It is then possible to place an order directly using the CIN and the SIRIUS ACT Configurator (Mail shopping cart) or via the standard order channels.

Standard ordering channels:

- Configurator: www.siemens.com/sirius-act/configurator
- Electronic Catalog CA 01 on DVD
- Industry Mall: www.usa.siemens.com/industrymall

Ordering example 1

A label with 2 lines of text is required:

3SU1900-0BB31-0AZ0

Q1Y

Z1=Text 1

Z2=Text 2

Ordering example 2

A label inscribed with symbol No. 5638 according to IEC 60417 is required:

3SU1900-0BB31-0AZ0

Q3Y

Z=IEC5638








Push Button Units and Indicator Lights

Accessories

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Protection/access protection

Selection and ordering data

	Product version	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Protective caps							
	Sealable caps	Plastic	Black	B	3SU1900-0DA10-0AA0	1	1 unit
			Clear	B	3SU1900-0DA70-0AA0	1	1 unit
	Sealable caps for pushbuttons	Plastic	Black	B	3SU1900-0EL10-0AA0	1	1 unit
			Clear	B	3SU1900-0EL70-0AA0	1	1 unit
	Silicone protective caps for pushbuttons, flat	Plastic	Clear	A	3SU1900-0DB70-0AA0	1	1 unit
				A	3SU1900-0ED70-0AA0	1	1 unit
	Silicone protective caps for pushbuttons, raised	Plastic	Clear	A	3SU1900-0DC70-0AA0	1	1 unit
				A	3SU1900-0EE70-0AA0	1	1 unit
	Silicone protective caps for selectors, short	Plastic	Clear	B	3SU1900-0DD70-0AA0	1	1 unit
				B	3SU1900-0EF70-0AA0	1	1 unit
	Silicone protective caps for mushroom pushbuttons 40 mm	Plastic	Clear	B	3SU1900-0DE70-0AA0	1	1 unit
				B	3SU1900-0EG70-0AA0	1	1 unit
	Silicone protective caps for EMERGENCY STOP	Plastic	Clear	B	3SU1900-0DF70-0AA0	1	1 unit
				B	3SU1900-0EH70-0AA0	1	1 unit

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Push Button Units and Indicator Lights

Accessories

Protection/access protection

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Product version	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Protective caps						
	Silicone protective caps for twin pushbuttons, flat	Plastic	Clear	▶ 3SU1900-0DG70-0AA0	1	1 unit
	Silicone protective caps for twin pushbuttons, raised	Plastic	Clear	B 3SU1900-0DH70-0AA0	1	1 unit
	Silicone-free protective caps for twin pushbuttons, raised	Plastic	Clear	B 3SU1900-0EK70-0AA0	1	1 unit
	Dust caps for key-operated switches	Plastic	Black	B 3SU1900-0EB10-0AA0	1	1 unit
Protective collars						
	Sun collars	Plastic	Black	B 3SU1900-0DJ10-0AA0	1	1 unit
	360° protective collars for pushbuttons and selectors, short	Plastic	Black	B 3SU1900-0DW10-0AA0	1	1 unit

Push Button Units and Indicator Lights

Accessories

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Protection/access protection

Product version	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Protective collars						
 3SU1950-0DK80-0AA0	360° protective collars for pushbuttons, visibility from the side	Metal	Silver	B	3SU1950-0DK80-0AA0	1 1 unit
 3SU1950-0DL80-0AA0	360° protective collars for mushroom pushbuttons 40 mm, visibility from the side	Metal	Silver	B	3SU1950-0DL80-0AA0	1 1 unit
 3SU1900-0DY30-0AA0	Protective collars for EMERGENCY STOP	Plastic	Yellow Silver	▶ ▶	3SU1900-0DY30-0AA0 3SU1900-0DY80-0AA0	1 1 unit 1 1 unit
 3SU1950-0DX30-0AA0	Protective collars for padlocks	Metal	Yellow Silver	B B	3SU1950-0DX30-0AA0 3SU1950-0DX80-0AA0	1 1 unit 1 1 unit
 3SU1900-0EA30-0AA0	360° protective collars for EMERGENCY STOP, SEMI-Industry	Plastic	Yellow	B	3SU1900-0EA30-0AA0	1 1 unit
 3SU1900-0EC10-0AA0	Protection for sensor switch	Plastic	Black	B	3SU1900-0EC10-0AA0	1 1 unit

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Push Button Units and Indicator Lights

Accessories

Protection/access protection

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Locking devices



3SU1950-0DM80-0AA0

Locking devices for pushbuttons
flat, for raised front ring and
raised, castellated front ring

Metal

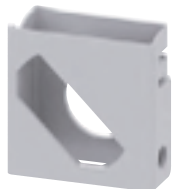
Silver

B

3SU1950-0DM80-0AA0

1

1 unit



3SU1950-0DN80-0AA0

Locking devices for pushbuttons,
raised

Metal

Silver

B

3SU1950-0DN80-0AA0

1

1 unit



3SU1950-0DP80-0AA0

Locking devices for mushroom
pushbuttons D30, D40

Metal

Silver

B

3SU1950-0DP80-0AA0

1

1 unit



3SU1950-0DQ80-0AA0

Locking devices for selectors
short/long actuator, in the left position

Metal

Silver

B

3SU1950-0DQ80-0AA0

1

1 unit



3SU1950-0DR80-0AA0

Locking devices for selectors
short/long actuator, in the center position

Metal

Silver

B

3SU1950-0DR80-0AA0

1

1 unit



3SU1950-0DS80-0AA0

Locking devices for selectors
short/long actuator, in the right position

Metal

Silver

B

3SU1950-0DS80-0AA0

1

1 unit



3SU1950-0DT80-0AA0

Locking devices for selectors
short/long actuator, window from center to right, blocked on left

Metal

Silver

B

3SU1950-0DT80-0AA0

1

1 unit

3SU1950-0DU80-0AA0

Locking devices for selectors
short/long actuator, window from center to left, blocked on right

Metal

Silver

B

3SU1950-0DU80-0AA0

1

1 unit

Covers for locking devices

Metal

Silver

B

3SU1950-0DV80-0AA0

1

1 unit



Push Button Units and Indicator Lights

Accessories



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Actuators

Selection and ordering data

	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Sealing plugs¹⁾						
 3SU1900-0FA10-0AA0	Plastic	Black	▶	3SU1900-0FA10-0AA0	1	1 unit
	Metal, matte	Sand gray	A	3SU1930-0FA80-0AA0	1	1 unit
 3SU1950-0FA80-0AA0	Metal, shiny	Silver	A	3SU1950-0FA80-0AA0	1	1 unit

¹⁾ The sealing plug is mounted with a holder.
Modules might already be mounted on the holder.

	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Buttons, flat						
For pushbuttons						
	Plastic	Black	B	3SU1900-0FT10-0AA0	100	10 units
		Red	▶	3SU1900-0FT20-0AA0	100	10 units
		Yellow	B	3SU1900-0FT30-0AA0	100	10 units
		Green	▶	3SU1900-0FT40-0AA0	100	10 units
		Blue	B	3SU1900-0FT50-0AA0	100	10 units
		White	B	3SU1900-0FT60-0AA0	100	10 units
For illuminated pushbuttons						
	Plastic	Amber	B	3SU1901-0FT00-0AA0	100	10 units
		Red	B	3SU1901-0FT20-0AA0	100	10 units
		Yellow	▶	3SU1901-0FT30-0AA0	100	10 units
		Green	▶	3SU1901-0FT40-0AA0	100	10 units
		Blue	B	3SU1901-0FT50-0AA0	100	10 units
		White	▶	3SU1901-0FT60-0AA0	100	10 units
		Clear	A	3SU1901-0FT70-0AA0	100	10 units

Buttons, raised						
For pushbuttons						
	Plastic	Black	B	3SU1900-0FS10-0AA0	1	10 units
		Red	B	3SU1900-0FS20-0AA0	1	10 units
		Yellow	B	3SU1900-0FS30-0AA0	1	10 units
		Green	B	3SU1900-0FS40-0AA0	1	10 units
3SU1900-0FS30-0AA0						
For illuminated pushbuttons						
	Plastic	Red	▶	3SU1901-0FS20-0AA0	1	10 units
		Yellow	B	3SU1901-0FS30-0AA0	1	10 units
		Green	B	3SU1901-0FS40-0AA0	1	10 units
		Blue	B	3SU1901-0FS50-0AA0	1	10 units
		Clear	B	3SU1901-0FS70-0AA0	1	10 units
3SU1901-0FS40-0AA0						

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Actuators

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	Material	Key number	RFID coding version	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Ronis keys								
	Metal	SB30 455	--	Silver	▶ B	3SU1950-0FB80-0AA0 3SU1950-0FC80-0AA0	1 1	1 unit 1 unit
3SSU1950-0FB80-0AA0								
BKS keys								
	Metal	S1	--	Silver	B	3SU1950-0FD80-0AA0	1	1 unit
3SSU1950-0FD80-0AA0								
OMR keys								
	Metal	73038 73037 73034 73033	--	Blue Red Black Yellow	B B B B	3SU1950-0FJ50-0AA0 3SU1950-0FK20-0AA0 3SU1950-0FL10-0AA0 3SU1950-0FM30-0AA0	1 1 1 1	1 unit 1 unit 1 unit 1 unit
3SSU1950-0FJ50-0AA0								
CES keys								
	Metal	LSG1 SSG10 VL5	--	Silver	B A B	3SU1950-0FN80-0AA0 3SU1950-0FP80-0AA0 3SU1950-0FQ80-0AA0	1 1 1	1 unit 1 unit 1 unit
3SSU1950-0FP80-0AA0								
IKON keys								
	Metal	360012K1	--	Silver	B	3SU1950-0FR80-0AA0	1	1 unit
3SU1950-0FR80-0AA0								
ID keys ID group individual								
	Plastic	--	Individually coded, programmable several times	White	X	3SU1900-0FU60-0AA0	1	1 unit
3SU1900-0FU60-0AA0								
ID keys								
	Plastic	--	ID group 1 ID group 2 ID group 3 ID group 4	Green Yellow Red Blue	X X X X	3SU1900-0FV40-0AA0 3SU1900-0FW30-0AA0 3SU1900-0FX20-0AA0 3SU1900-0FY50-0AA0	1 1 1 1	1 unit 1 unit 1 unit 1 unit
3SU1900-0FV40-0AA0								

Enclosures

Selection and ordering data

	Product version	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Cable glands							
	Metric M20 cable glands for enclosures	Plastic	Black	▶	3SU1900-0HG10-0AA0	1	1 unit
	Metric M25 cable glands for enclosures			B	3SU1900-0HH10-0AA0	1	1 unit
3SU1900-0HG10-0AA0							
For explosion protection (ATEX)							
Ex category II 2D Ex tb IIIC T120 °C Db							
	Metric M20 cable glands for enclosures	Plastic	Black	B	3SU1900-0HG10-0AA1	1	1 unit
	Metric M25 cable glands for enclosures			B	3SU1900-0HH10-0AA1	1	1 unit
3SU1900-0HG10-0AA1							
Connection pieces							
	For plastic enclosures						
	M20/M20 connection pieces for connecting 2 enclosures	Plastic	Black	B	3SU1900-0HJ10-0AA0	1	1 unit
	M20/M25 connection pieces for connecting 2 enclosures			B	3SU1900-0HK10-0AA0	1	1 unit
	M25/M25 connection pieces for connecting 2 enclosures			B	3SU1900-0HL10-0AA0	1	1 unit
3SU1900-0HJ10-0AA0							
	For metal enclosures						
	M20/M20 connection pieces for connecting 2 enclosures	Metal	Silver	B	3SU1950-0HJ10-0AA0	1	1 unit
	M20/M25 connection pieces for connecting 2 enclosures			B	3SU1950-0HK10-0AA0	1	1 unit
	M25/M25 connection pieces for connecting 2 enclosures			B	3SU1950-0HL10-0AA0	1	1 unit
3SU1950-0HJ10-0AA0							

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Product version	Material	Color	DT	Insulation piercing method	PU (UNIT, SET, M)	PS*
				Order No.		

Adapters for AS-i shaped cables



3SU1900-0HX10-0AA0

Insulation piercing method	Plastic	Black	B	3SU1900-0HX10-0AA0 3SU1900-0HY10-0AA0	1	1 unit
M20 M25			B		1	1 unit

Adapters

For plastic enclosures

M12 sockets, 4-pole

M20	Plastic	Black	B	3SU1930-0HA10-0AA0	1	1 unit
M25			B	3SU1930-0HB10-0AA0	1	1 unit

M12 connectors, 4-pole

M20			B	3SU1930-0HC10-0AA0	1	1 unit
M25			B	3SU1930-0HD10-0AA0	1	1 unit

M12 sockets, 5-pole

M20	Plastic	Black	B	3SU1930-0HP10-0AA0	1	1 unit
M25			B	3SU1930-0HQ10-0AA0	1	1 unit

M12 connectors, 5-pole

M20			B	3SU1930-0HR10-0AA0	1	1 unit
M25			B	3SU1930-0HS10-0AA0	1	1 unit

M12 sockets, 8-pole

M20	Plastic	Black	B	3SU1930-0HT10-0AA0	1	1 unit
M25			B	3SU1930-0HU10-0AA0	1	1 unit

M12 connectors, 8-pole

M20			B	3SU1930-0HV10-0AA0	1	1 unit
M25			B	3SU1930-0HW10-0AA0	1	1 unit

For metal enclosures

M12 sockets, 4-pole

M20	Metal	Black	B	3SU1950-0HA10-0AA0	1	1 unit
M25			B	3SU1950-0HB10-0AA0	1	1 unit

M12 connectors, 4-pole

M20			B	3SU1950-0HC10-0AA0	1	1 unit
M25			B	3SU1950-0HD10-0AA0	1	1 unit

M12 sockets, 5-pole

M20	Metal	Black	B	3SU1950-0HP10-0AA0	1	1 unit
M25			B	3SU1950-0HQ10-0AA0	1	1 unit

M12 connectors, 5-pole

M20			B	3SU1950-0HR10-0AA0	1	1 unit
M25			B	3SU1950-0HS10-0AA0	1	1 unit

M12 sockets, 8-pole

M20	Metal	Black	B	3SU1950-0HT10-0AA0	1	1 unit
M25			B	3SU1950-0HU10-0AA0	1	1 unit

M12 connectors, 8-pole

M20			B	3SU1950-0HV10-0AA0	1	1 unit
M25			B	3SU1950-0HW10-0AA0	1	1 unit

Enclosure cover monitoring



3SU1900-0HM10-0AA0

Enclosure cover monitoring (module with extension plunger)	Plastic	Black	B	3SU1900-0HM10-0AA0	1	1 unit
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Push Button Units and Indicator Lights

Accessories

• Revised •
07/15/16

Miscellaneous accessories

Selection and ordering data

	Product version	Material	Color	DT	Order No.	PU (UNIT, SET, M)	PS*
Accessories							
	PCB carriers	Plastic	Black	▶	3SU1900-0KA10-0AA0	1	10 units
	Pressure plates for selectors and locks	Plastic	White	▶	3SU1900-0KC10-0AA0	1	10 units
	Connection kits, standard slave	Plastic	Black	B	3SU1900-0KD10-0AA0	1	1 unit
	ASi-F-slave	Plastic	Black	B	3SU1900-0KE10-0AA0	1	1 unit
	Drilling template for 30 x 40 grid, horizontal	Plastic	Black	B	3SU1900-0KF10-0AA0	1	1 unit
	Extension plungers For compensation of the distance between the pushbutton and the unlatching button of an overload relay	Plastic	Black	A	3SU1900-0KG10-0AA0	1	1 unit
	Adapters for standard rail mounting	Plastic	Silver	▶	3SU1900-0KH80-0AA0	1	1 unit
	Adapters for actuators and indicators with front ring for flat mounting	Metal	Silver	A	3SU1950-0KJ80-0AA0	1	1 unit
	Adapters for mounting hole 30.5 mm For mounting 22.5 mm pushbuttons and indicator lights	Metal	Silver	▶	3SU1950-0KB10-0AA0	1	1 unit
	Grounding studs	Metal	Silver	B	3SU1950-0KK80-0AA0	100	50 units
	Connectors for sensor switches	Metal	Black	B	3SU1900-0KL10-0AA0	100	50 units

Approvals, test certificates, characteristic curves

An overview of the certificates available for Industrial Control products along with more technical documentation can be consulted daily on the Internet at:

www.siemens.com/sirius/approvals



Product support: Approvals/certificates



Product support: Characteristics

Safety characteristics

In the following standards, the so-called B10 values for calculating the safety integrity or safety integrity level (SIL) in functional safety at a high or continuous demand rate are required also for electromechanical switchgear:

- IEC 62061 "Safety of machines – Functional safety of safety-related electrical, electronic and programmable electronic control systems",
- ISO 13849-1 "Safety of machines – Safety-related components of controls – Part 1: General principles".

Failure rates of electromechanical components are required for calculating the safety integrity or safety integrity level (SIL) in functional safety:

- in the manufacturing industry at a high demand rate
- in the process industry at a low demand rate

Further requirements are laid down in IEC 61511-1 "Functional safety – Safety instrumented systems for the process industry sector – Part 1: Framework, definitions, system, hardware and software requirements".

The German versions of the above standards are:

- EN 62061 (VDE 0113-50), 2005 + AMD 1:2013, which since 31.12.2005 has been harmonized as EN 62061 under the Machinery Directive
- EN ISO 13849-1:2008
- EN 61511-1 (VDE 810-1)

The TÜV-tested Safety Evaluation Tool assists in calculating the safety function as verification for the machine documentation. It is available on the Internet at

www.siemens.com/safety-evaluation-tool.

At www.siemens.com/safety-integrated you will also find examples of functions with calculations according to the current standards.

Definitions

$\lambda(t) dt$ is the probability that a unit which has not failed by a certain time t will fail in the following interval $(t; t + dt)$. Failure rates have the dimension 1/time unit, e.g. 1/h.

Failure rates for components are often specified in FIT (failures in time unit): 1 FIT equals $10^{-9}/h$.

From the failure rate it is possible to derive a (mathematical) distribution function of the failure probability:

$F(t) = 1 - \exp(-\lambda t)$, with λ as constant failure rate

- The mean value of this exponential distribution is also referred to as:
 - Mean Time To Failure (MTTF) in the case of irreparable components; 63.2 % of components fail by the MTTF.
 - Mean Operating Time Between Failures (MTBF) in the case of reparable components.
- $MTTF = 1/\lambda$
(MTTF is a statistical mean value but no guarantee for endurance)

Electromechanical components are often irreparable components. In general, the failure rate of monitored units changes with age.

Standards and approvals

The B10 value for devices subject to wear is expressed in number of operating cycles:

- it is the number of operating cycles after which 10 % of the test specimens fail in the course of an endurance test (or: the number of operating cycles after which 10 % of the devices have failed).

For low demand rates (mainly in the process industry), the failure rate and not the B10 value is used to determine the failure probability.

Standard B10 values at a high demand rate

With the help of the B10 value and a simplified formula (see section 6.7.8.2.1 of EN 62061), the user can then calculate the total failure rate of an electromechanical component:

$$\lambda = 0.1 \times C/B10$$

with C = operating cycles per hour. C is specified by the user.

The failure rate is made up of safe (λ_S) and dangerous (λ_D) failures:

$$\lambda = \lambda_S + \lambda_D$$

or

$$\lambda_D = [\text{share of dangerous failures in \%}] \times \lambda$$

$$\lambda_S = [\text{share of safe failures in \%}] \times \lambda$$

The failure rate of the dangerous failures λ_D of the components used is needed for further calculations.

Listed in the following table are the standard B10 values and the share of dangerous failures for SIRIUS product groups at a high demand rate.

Standard B10 values (at a high demand rate)		
SIRIUS ACT product group (electromechanical components)	Standard B10 value ¹⁾ (operating cycles)	Share of dangerous failures
3SU1 EMERGENCY-STOP mushroom pushbuttons (with positive-opening contacts)	100 000	20 %
3SU1 pushbuttons (non-latching, with positive-opening contacts)	10 000 000	20 %

¹⁾ Only applies under the conditions specified in the technical specifications.

The B10_d value used in EN ISO 13849-1:2008 is determined as follows:

$$B10_d = \frac{B10}{\text{Share of dangerous failures}}$$

Calculation example

A protective door is monitored by a position switch with a separate actuator.

The protective door is opened 4 times an hour.

The overall failure rate of the position switch is:

$$\lambda = 0.1 \cdot C/B10 \text{ [failures/h]}$$

$$\lambda = 0.1 \cdot 4/1000000 = 4 \cdot 10^{-7} \text{ [failures/h]}$$

The dangerous failure rate is calculated with:

$$\lambda_D = 20 \% \text{ of } \lambda = 0.2 \cdot 4 \cdot 10^{-7} \text{ [failures/h]}$$

$$\lambda_D = 8 \cdot 10^{-8} \text{ [failures/h]}$$

Standard failure rates (at a low demand rate)

On the basis of the failure rates, it is possible to calculate the average probability of failure on demand (PFD_{avg}) of a PLT protective device.

A so-called low demand rate is assumed, meaning the rate of demand on the safety-related system amounts to no more than once a year and is not greater than double the frequency of the repeat test.

A repeat test once a year is recommended for electromechanical components in order to reveal passive faults.

For special applications it is possible, in agreement with the inspecting institution (e.g. a technical inspectorate, government agency or the like) to extend the test intervals by using suitable solutions (e.g. a multi-channel version etc.).

Listed in the following table are the standard failure rates and the share of dangerous failures for SIRIUS product groups at a low demand rate.

Standard failure rates at a low demand rate		
SIRIUS ACT product group (electromechanical components)	Standard failure rates (in FIT) ¹⁾	Share of dangerous failures
3SU1 EMERGENCY-STOP mushroom pushbuttons (with positive-opening contacts)	100	20 %
3SU1 pushbuttons (non-latching, with positive-opening contacts)	100	20 %

¹⁾ The failure rates specified in the table were limited to 100 FIT.

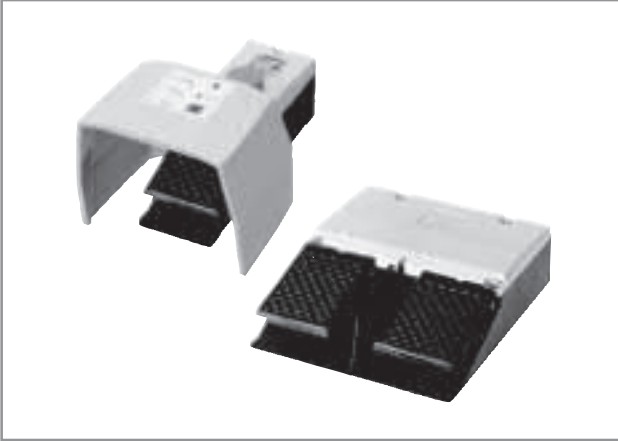
Push Button Units and Indicator Lights

3SE2, 3SE3 Foot Switches

Plastic and metal enclosures

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Overview



Foot switches with metal enclosures

Standard switches

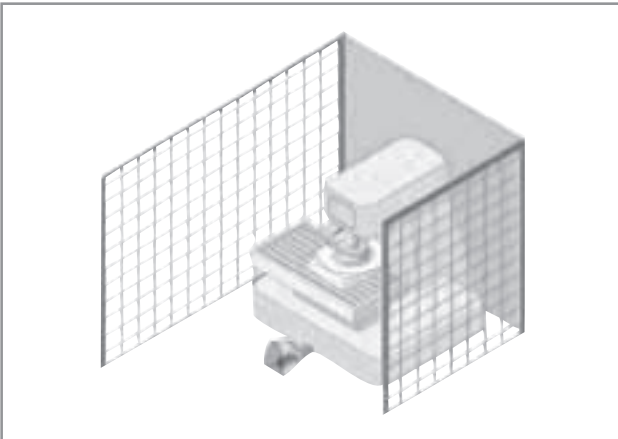
The 3SE2 9 and 3SE3 9 foot switch range encompasses versions in a metal enclosure for rugged applications as well as versions with plastic enclosure for less harsh environments. The devices can be supplied with or without a cover and have fixing holes for them to be screwed to the floor.

Depending on the particular application, the metal enclosures can be ordered in latching or momentary-contact versions. The momentary-contact pedal switch in the plastic enclosure has one microswitch (changeover contact) per actuating pedal.

Safety foot switches

The 3SE2 924-3AA20 single-pedal safety foot switches are used on machines and plants as OK switches when operation by hand is not possible and the EMERGENCY-STOP function must be available if a hazardous status arises. The switches are interlocked according to EN ISO 13850 and bear the CE mark in accordance with the machinery directive.

The safety foot switches are protected by a guard hood against accidental operation.



Application example

The switches have two contact blocks, each with one NO contact and one NC contact. The NO contacts and NC contacts of the two contact blocks are connected for easy connection of a single-phase motor. The normal workflow is initiated by pressing down the pedal as far as the pressure point so that the two NO contacts close and the motor starts to run.

If in the event of danger the pedal is pressed beyond the resistance of the pressure point, the positively driven NC contacts will open and the motor is stopped. At the same time the independent latching takes effect and holds the NC contacts in open position. This prevents the machine parts from continuing to run out of control or from being restarted.

After the hazard is eliminated, the machine can only be restarted after manually releasing the switch using a push button on the top of the enclosure. The contacts are then released again and return to their initial position (the NO contacts are open and the NC contacts are closed).

Technical specifications






Type	3SE29	3SE39
Metal and plastic enclosures		
Standards	IEC 60947-5-1	
Electrical load		
• At AC-15, 400 V		
- 1 NO + 1 NC A	16	—
- 2 NO + 2 NC A	6	—
- 3SE2 924-3AA20 (2 NO + 2 NC) A	16	—
• At 250 V AC A	—	5
Short-circuit protection		
- 1 NO + 1 NC / 3SE2 924-3AA20 A	16 (slow)	—
- 2 NO + 2 NC A	6 (slow)	—
- 1 CO contact A	—	5 (slow)
Mechanical endurance	> 10 ⁶ operating cycles	
Material		
• Enclosures	Aluminum casting	Impact-resistant thermoplast, self-extinguishing according to UL 94 VO
• Covers	Thermoplast	—
• Guard hoods	Aluminum casting	Metal
Degree of protection	IP65	IP65
Ambient temperature °C	-25 ... +80	-10 ... +75
Connection	Cable entry, metric	Cable AWG20, UL Style 2464, length 3 m

Push Button Units and Indicator Lights

3SE2, 3SE3 Foot Switches

Plastic and metal enclosures

Selection and ordering data

Version	Slow-action contacts for each pedal	DT	Order No.	PU (UNIT, SET, M)	PS		
Metal enclosures, degree of protection IP65							
 3SE2 90.-AA20 3SE2 91.-AA20	Momentary-contact foot switches, single pedal M20 x 1.5 cable entry						
	• Without hood	1 NO + 1 NC	⤵ A	3SE2 902-0AB20	1 1 unit		
		2 NO + 2 NC	⤵ A	3SE2 903-1AB20	1 1 unit		
	• With hood	1 NO + 1 NC	⤵ A	3SE2 902-0AA20	1 1 unit		
		2 NO + 2 NC	⤵ A	3SE2 903-1AA20	1 1 unit		
 3SE2 932-AB20	Momentary-contact foot switches, single pedal M20 x 1.5 cable entry						
	• Without hood	1 NO + 1 NC	⤵ C	3SE2 912-2AB20	1 1 unit		
	• With hood	1 NO + 1 NC	⤵ C	3SE2 912-2AA20	1 1 unit		
	Momentary-contact foot switches, two pedals M25 x 1.5 cable entry						
	• Without hood	1 NO + 1 NC	⤵ B	3SE2 932-0AB20	1 1 unit		
 3SE2 932-AA20		2 NO + 2 NC	⤵ B	3SE2 932-1AB20	1 1 unit		
	• With hood	1 NO + 1 NC	⤵ B	3SE2 932-0AA20	1 1 unit		
		2 NO + 2 NC	⤵ B	3SE2 932-1AA20	1 1 unit		
	 3SE2 924-3AA20	Safety foot switches, single pedal, with hood, M20 x 1.5 cable entry, with interlock according to ISO 13850, NO closes as momentary contact type, NC opens with latching		2 NO + 2 NC	⤵ C	3SE2 924-3AA20	1 1 unit
Plastic enclosures, degree of protection IP65							
 3SE3 902-4CA20	Momentary-contact pedal switches, 3 m cable						
	• Single pedal						
	- Without hood	1 CO contact	B	3SE3 902-4CB20	1 1 unit		
	- With hood	1 CO contact	B	3SE3 902-4CA20	1 1 unit		
	• Two pedals, without hood	2 × 1 CO	B	3SE3 934-5CB20	1 1 unit		
 3SE3 934-5CB20							

⤵ Positive opening according to IEC 60947-5-1, Appendix K.

Push Button Units and Indicator Lights

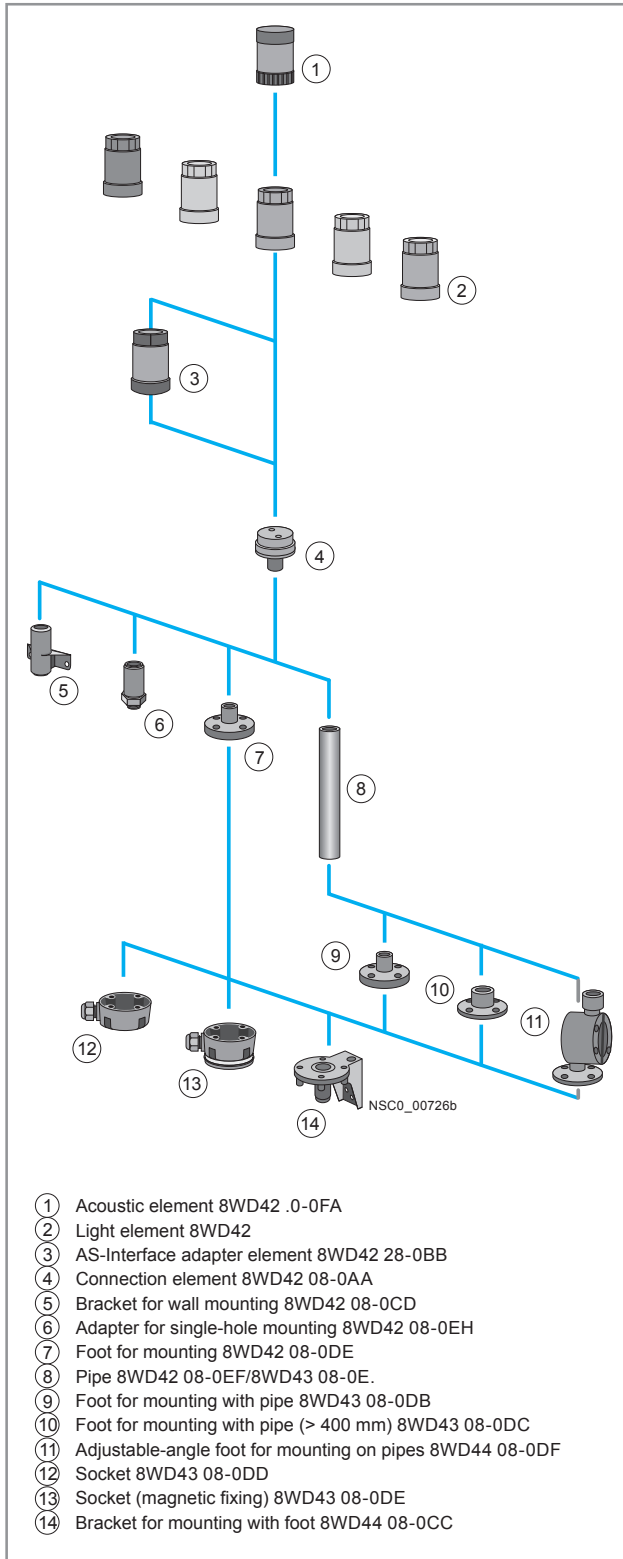
8WD4 Signaling Columns

General Data

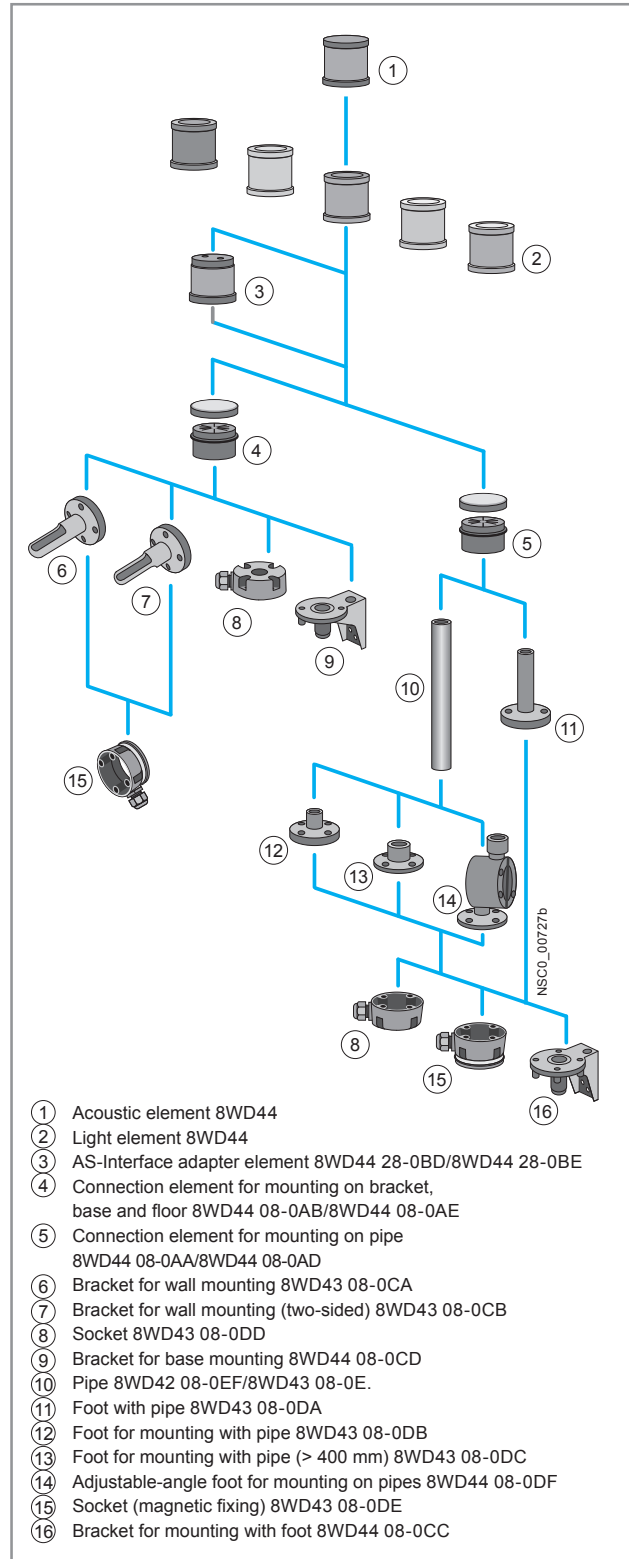
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Overview

The 8WD4 signaling columns are flexible in design and versatile in use.



8WD42 signaling columns (width 50 mm) with up to 4 elements



8WD44 signaling columns (width 70 mm) with up to 5 elements

Push Button Units and Indicator Lights

8WD4 Signaling Columns

General Data

Two product series are available:

- 8WD42
 - Thermoplast enclosure, diameter 50 mm
 - Degree of protection IP54
 - Up to 4 elements can be mounted between the connection element and the cover
- 8WD44
 - Thermoplast enclosure, diameter 70 mm
 - Advanced design and significantly improved illumination
 - Faster and more flexible connection using spring-type terminals
 - Integrated degree of protection IP65
 - Up to 5 elements can be mounted between the connection element and the cover



Signaling columns, mounting examples

The illustrated examples are from the left:

- 8WD42: Cover (no No.), 4 light elements ②, connection element ④, pipe ⑧, foot ⑨
- 8WD44: Acoustic element with integral cover ①, 2 light elements ②, connection element ⑤, foot with pipe ⑪
- 8WD44: Cover (no No.), 4 light elements ②, AS-Interface adapter element ③, connection element ④, bracket for wall mounting ⑥
- 8WD44: Cover (no No.), 3 light elements ②, AS-Interface adapter element ③, connection element ⑤, foot with pipe ⑪

Note:

The cover is supplied with the connection element; it is not needed with the acoustic element.

Benefits

- Choice of various light and acoustic elements with different functions: continuous light, blinklight, flashlight and rotating light; buzzer and siren
- Light elements with particularly long-lasting LEDs
- Variety of colors: red, yellow, green, white or blue
- Optimized illumination through improved prism technology with the 8WD44
- Acoustic elements can be adjusted in tone and volume
- Extremely resistant to shock and vibrations
- Easy connection and quick lamp change with secure bayonet mechanism
- Communication capability through connection to AS-Interface

Application

8WD4 signaling columns are used in machines or in automatic processes for monitoring complex procedures or as visual or acoustic warning devices in emergency situations, e.g. for displaying individual assembly stages.

Communication capability

Connection to AS-Interface

The 8WD4 signaling columns can be directly connected to the AS-Interface bus system through an adapter element that can be integrated in the column. Wiring outlay is reduced as the result. The two-wire bus cable is fixed to the terminals in the connection element. Up to four signaling elements can be mounted on it using an adapter element.

A/B technology enables the connection of up to 62 slaves on one AS-Interface system.

Connection

The signaling elements are wired up using the screw terminals in the connection element, screw terminals on the 8WD42 and screw or spring-type terminals on the 8WD44.

Cable outlet

The connecting cables can be guided either downwards or sideways through the cable gland using an adapter that can be screwed under the foot. This makes wiring easier if there is no access from below.

Connection to AS-Interface



8WD42:

The two-wire bus cable is fixed to the screw terminals in the connection element. The adapter element must be the first module to be mounted on the connection element. A maximum of 4 signaling elements can then be mounted on it.

The adapter element 8WD42 28-0BB is a standard slave.

8WD44:

The two-wire bus cable is fixed to the screw or spring-type terminals in the connection element. The adapter element must be the first module to be mounted on the connection element. The signaling elements can then be mounted on it.

The adapter element 8WD44 28-0BE is a standard slave. A maximum of 4 signaling elements can be mounted on it.

The adapter element 8WD44 28-0BD with A/B technology enables the connection of up to 62 slaves on one AS-Interface system. The addressing socket provides user-friendly parameterization of the AS-Interface elements. A maximum of 3 signaling elements can be mounted on it.

Push Button Units and Indicator Lights

8WD4 Signaling Columns

General Data

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Technical specifications

Type	8WD42	8WD44
General data		
Approvals	UL, CSA	UL, CSA
Light and acoustic elements		
Rated voltage, power consumption		
Light elements with incandescent lamp	(AC values for 50/60 Hz)	(AC values for 50/60 Hz)
• Continuous light	12 V, 24 V, 115 V, 230 V AC/DC	12 V, 24 V, 115 V, 230 V AC/DC
• Blinklight	24 V AC/DC/125 mA; 115 V AC/20 mA; 230 V AC/15 mA	24 V AC/DC/125 mA; 115 V AC/20 mA; 230 V AC/15 mA
• Flashlights	—	24 V DC/125 mA; 115 V AC/20 mA; 230 V AC/35 mA
• Max. inrush current, blinklight/flashlight	—	500 mA
Light elements with integrated LED		
• Continuous light	24 V AC/DC/60 mA	24 V AC/DC/45 mA; 115 V AC/DC/25 mA; 230 V AC/25 mA
• Blinklight	—	24 V AC/DC/40 mA
• Rotating light	—	24 V AC/DC/70 mA
Acoustic elements		
• Buzzer element (tone: pulsating or continuous, 85 dB)	24 V AC/DC/25 mA; 115 V AC/DC/25 mA; 230 V AC/25 mA	24 V AC/DC/25 mA; 115 V AC/DC/25 mA; 230 V AC/25 mA
• Siren element (8 tones + amplification can be set, 100 dB)	—	24 V AC/DC/80 mA; 115 V AC/30 mA; 230 V AC/16 mA
• Siren element (108 dB)	—	24 V DC/100 mA
Power consumption		
• Incandescent lamps, base BA 15d	W	7
• Flashlight, flash energy	Ws	2
Endurance		
• Flashlights	4 x 10 ⁶ flashes	4 x 10 ⁶ flashes
AS-Interface adapter elements		
IO code/ID code	8/F	8/E
Power supply		
• Operational voltage	V	Through bus cable
• Power consumption I_{max}	mA	18.5 ... 31.6
Protective measures		
• Watchdog	✓	✓
• Short-circuit/overload protection	External back-up fuse M 1.6 A	✓
• Reverse polarity protection	✓	✓
• Induction protection	N/A	✓
Outputs		
• Load voltage	V	4 Relay outputs
	V	External auxiliary voltage
		0 ... 30 DC
		0 ... 230 AC
• Current carrying capacity ΣI_{max}		3 solid-state outputs
- With external auxiliary voltage	A	through bus cable or external auxiliary voltage, switch-selectable
- Without external auxiliary voltage	A	
		0.3
		0.2
Operating temperature	°C	-20 ... +50
Enclosures		
Enclosure material	Thermoplast (polyamide), impact-resistant, black	Thermoplast (polyamide), impact-resistant, black
Light elements	Thermoplast (polycarbonate)	Thermoplast (polycarbonate)
Mounting		
• Horizontal (floor mounting, foot with 25 mm Ø pipe)	✓	✓
• Horizontal (single-hole mounting)	✓	—
• Vertical with bracket	✓	✓
Degree of protection		
• Light elements	IP54	IP65 (seal premounted with every module)
• Acoustic elements, AS-i adapter elements	IP54	IP65
Operating temperature	°C	-20 ... +50
Connection		
• Conductor cross-sections	mm ²	Spring-type terminals/M3 screw terminals
• Tightening torque	Nm	Max. 2.5
		- / Max. 0.5

Push Button Units and Indicator Lights

8WD4 Signaling Columns

8WD42 signaling columns, 50 mm diameter

Overview

Features:

- Thermoplast enclosure, diameter 50 mm
- Degree of protection IP54
- Up to 4 elements can be mounted

Selection and ordering data

Version	Rated voltage	Color	DT	Order No.	PU (UNIT, SET, M)	PS	PG	
	V							
Acoustic elements ¹⁾								
	Buzzer elements 80 dB, pulsating or continuous tone, adjust- able by means of a wire jumper	24 AC/DC	Black	A	8WD42 20-0FA	1	1 unit	41J
		115 AC		A	8WD42 40-0FA	1	1 unit	41J
		230 AC		A	8WD42 50-0FA	1	1 unit	41J
Light elements for incandescent lamps/LEDs, BA 15d bases ²⁾								
	Continuous light elements	24 ... 230 AC/DC	Red	A	8WD42 00-1AB	1	1 unit	41J
			Green	A	8WD42 00-1AC	1	1 unit	41J
			Yellow	A	8WD42 00-1AD	1	1 unit	41J
			Clear	A	8WD42 00-1AE	1	1 unit	41J
			Blue	A	8WD42 00-1AF	1	1 unit	41J
Light elements with integrated LED								
	Continuous light elements	24 AC/DC	Red	A	8WD42 20-5AB	1	1 unit	41J
			Green	A	8WD42 20-5AC	1	1 unit	41J
			Yellow	A	8WD42 20-5AD	1	1 unit	41J
			Clear	X	8WD42 20-5AE	1	1 unit	41J
			Blue	X	8WD42 20-5AF	1	1 unit	41J
  	Blinklight elements	24 AC/DC	Red	A	8WD42 20-5BB	1	1 unit	41J
			Green	A	8WD42 20-5BC	1	1 unit	41J
			Yellow	A	8WD42 20-5BD	1	1 unit	41J
			Clear	A	8WD42 20-5BE	1	1 unit	41J
			Blue	A	8WD42 20-5BF	1	1 unit	41J
		115 AC	Red	A	8WD42 40-5BB	1	1 unit	41J
			Green	A	8WD42 40-5BC	1	1 unit	41J
			Yellow	A	8WD42 40-5BD	1	1 unit	41J
			Clear	D	8WD42 40-5BE	1	1 unit	41J
			Blue	D	8WD42 40-5BF	1	1 unit	41J
	230 AC	Red	A	8WD42 50-5BB	1	1 unit	41J	
		Green	A	8WD42 50-5BC	1	1 unit	41J	
		Yellow	A	8WD42 50-5BD	1	1 unit	41J	
		Clear	A	8WD42 50-5BE	1	1 unit	41J	
		Blue	A	8WD42 50-5BF	1	1 unit	41J	
Adapter elements for AS-Interface								
	AS-Interface adapter elements with external auxiliary voltage	For 4 signaling ele- ments 24 V DC	Black	A	8WD42 28-0BB	1	1 unit	41J
								
Connection elements ³⁾								
	Connection elements with cover For mounting on pipes, floors and angles		Black	A	8WD42 08-0AA	1	1 unit	41J

¹⁾ One acoustic element can be mounted per signaling column. The cover is included in the scope of supply of the acoustic elements and fixed in place.

²⁾ The lamp is not included in the scope of supply. Please order separately.

³⁾ The connection element with cover is an essential part for assembling the signaling columns.

Note:

For mounting and configuring aid see the publication "Versatile, robust, communication-capable: SIRIUS signaling columns and integrated signal lamps", Order No. E20001-A670-P305.

Push Button Units and Indicator Lights

8WD4 Signaling Columns

8WD42 signaling columns, 50 mm diameter

Version	Rated voltage	Color	DT	Order No.	PU (UNIT, SET, M)	PS	
V							
Lamps							
	Incandescent lamps, 5 W						
	Base BA 15d	24 AC/DC	A	8WD43 28-1XX	1	10 units	
		115 AC	A	8WD43 48-1XX	1	10 units	
		230 AC	A	8WD43 58-1XX	1	10 units	
	LEDs						
	Base BA 15d	24 AC/DC	Red	A	8WD44 28-6XB	1	1 unit
			Green	A	8WD44 28-6XC	1	1 unit
			Yellow	A	8WD44 28-6XD	1	1 unit
			Clear	A	8WD44 28-6XE	1	1 unit
			Blue	A	8WD44 28-6XF	1	1 unit
		115 AC	Red	A	8WD44 48-6XB	1	1 unit
			Green	A	8WD44 48-6XC	1	1 unit
			Yellow	A	8WD44 48-6XD	1	1 unit
			Clear	A	8WD44 48-6XE	1	1 unit
			Blue	A	8WD44 48-6XF	1	1 unit
		230 AC	Red	A	8WD44 58-6XB	1	1 unit
			Green	A	8WD44 58-6XC	1	1 unit
			Yellow	A	8WD44 58-6XD	1	1 unit
			Clear	A	8WD44 58-6XE	1	1 unit
			Blue	A	8WD44 58-6XF	1	1 unit
Mounting							
	Feet, single	Plastic, for mounting on pipes	A	8WD43 08-0DB	1	1 unit	
		Metal, for pipe lengths > 400 mm	A	8WD43 08-0DC	1	1 unit	
		Plastic, for floor mounting (without pipe)	A	8WD42 08-0DE	1	1 unit	
	Adjustable-angle feet for positioning in 7.5° increments ¹⁾	Plastic, for mounting on pipes, incl. rubber seal	X	8WD44 08-0DF	1	1 unit	
	Pipes, single	Length 100 mm	A	8WD42 08-0EF	1	1 unit	
		Length 150 mm	A	8WD43 08-0EE	1	1 unit	
		Length 250 mm	A	8WD43 08-0EA	1	1 unit	
		Length 400 mm	A	8WD43 08-0EB	1	1 unit	
		Length 1000 mm	A	8WD43 08-0ED	1	1 unit	
	Sockets for feet	Side cable outlet	A	8WD43 08-0DD	1	1 unit	
		Side cable outlet, with magnetic fixing ²⁾	A	8WD43 08-0DE	1	1 unit	
	Brackets for mounting with foot		A	8WD44 08-0CC	1	1 unit	
	Brackets for wall mounting (plastic)	Mounting without feet and pipe	A	8WD42 08-0CD	1	1 unit	
	Adapters for single-hole mounting	Mounting without feet and pipe, with M18 thread and fixing nut	A	8WD42 08-0EH	1	1 unit	

For labeling panels see 8WD44, page 10/159.

¹⁾ Markings for 30°, 45°, 60° and 90°.

²⁾ For horizontal mounting, only 1 element is recommended.

Push Button Units and Indicator Lights

8WD4 Signaling Columns

8WD44 signaling columns, 70 mm diameter

Overview

Features:

- Thermoplast enclosure, diameter 70 mm
- Advanced design and significantly improved illumination

- Fast and flexible connection using spring-type terminals
- Integrated degree of protection IP65
- Up to 5 elements can be mounted

Selection and ordering data

Version	Rated voltage	Color	DT	Order No.	PU (UNIT, SET, M)	PS
	V					
Acoustic elements ¹⁾						
	Buzzer elements 85 dB, pulsating or continuous tone, adjust- able by means of a wire jumper	24 AC/DC	Black	A	8WD44 20-0FA	1 1 unit
		115 AC		A	8WD44 40-0FA	1 1 unit
		230 AC		A	8WD44 50-0FA	1 1 unit
	Siren elements, multi-tone, 100 dB, 8 tones and volume are adjustable	24 AC/DC	Black	A	8WD44 20-0EA2	1 1 unit
		115 AC		A	8WD44 40-0EA2	1 1 unit
		230 AC		A	8WD44 50-0EA2	1 1 unit
	Siren elements 108 dB, IP40	24 DC	Black	A	8WD44 20-0EA	1 1 unit
Light elements for incandescent lamps/LEDs, BA 15d bases ²⁾						
	Continuous light elements	12 ... 230 AC/DC	Red	A	8WD44 00-1AB	1 1 unit
			Green	A	8WD44 00-1AC	1 1 unit
			Yellow	A	8WD44 00-1AD	1 1 unit
			Clear	A	8WD44 00-1AE	1 1 unit
			Blue	A	8WD44 00-1AF	1 1 unit
	Blinklight elements	24 AC/DC	Red	A	8WD44 20-1BB	1 1 unit
			Green	A	8WD44 20-1BC	1 1 unit
			Yellow	A	8WD44 20-1BD	1 1 unit
			Clear	A	8WD44 20-1BE	1 1 unit
			Blue	A	8WD44 20-1BF	1 1 unit
		115 AC	Red	A	8WD44 40-1BB	1 1 unit
			Green	A	8WD44 40-1BC	1 1 unit
			Yellow	A	8WD44 40-1BD	1 1 unit
			Clear	A	8WD44 40-1BE	1 1 unit
			Blue	A	8WD44 40-1BF	1 1 unit
	230 AC	Red	A	8WD44 50-1BB	1 1 unit	
		Green	A	8WD44 50-1BC	1 1 unit	
		Yellow	A	8WD44 50-1BD	1 1 unit	
		Clear	A	8WD44 50-1BE	1 1 unit	
		Blue	A	8WD44 50-1BF	1 1 unit	
Light elements with integrated flash lamps ³⁾						
  	Flashlight elements with integrated electronic flash	24 DC	Red	A	8WD44 20-0CB	1 1 unit
			Green	A	8WD44 20-0CC	1 1 unit
			Yellow	A	8WD44 20-0CD	1 1 unit
			Clear	A	8WD44 20-0CE	1 1 unit
			Blue	A	8WD44 20-0CF	1 1 unit
		115 AC	Red	A	8WD44 40-0CB	1 1 unit
			Green	D	8WD44 40-0CC	1 1 unit
			Yellow	A	8WD44 40-0CD	1 1 unit
			Clear	D	8WD44 40-0CE	1 1 unit
			Blue	D	8WD44 40-0CF	1 1 unit
		230 AC	Red	A	8WD44 50-0CB	1 1 unit
			Green	A	8WD44 50-0CC	1 1 unit
			Yellow	A	8WD44 50-0CD	1 1 unit
			Clear	A	8WD44 50-0CE	1 1 unit
			Blue	A	8WD44 50-0CF	1 1 unit

¹⁾ One acoustic element can be mounted per signaling column. The cover is included in the scope of supply of the acoustic elements and fixed in place.





²⁾ The lamp is not included in the scope of supply. Please order separately.

³⁾ The lamp is included in the scope of supply.

Push Button Units and Indicator Lights

8WD4 Signaling Columns

8WD44 signaling columns, 70 mm diameter

Version	Rated voltage	Color	DT	Order No.	PU (UNIT, SET, M)	PS
V						
Light elements with integrated LED						
	Continuous light elements	24 AC/DC	Red	A	8WD44 20-5AB	1 1 unit
			Green	A	8WD44 20-5AC	1 1 unit
			Yellow	A	8WD44 20-5AD	1 1 unit
			Clear	A	8WD44 20-5AE	1 1 unit
			Blue	A	8WD44 20-5AF	1 1 unit
		115 AC	Red	A	8WD44 40-5AB	1 1 unit
			Green	A	8WD44 40-5AC	1 1 unit
			Yellow	A	8WD44 40-5AD	1 1 unit
			Clear	A	8WD44 40-5AE	1 1 unit
			Blue	A	8WD44 40-5AF	1 1 unit
		230 AC	Red	A	8WD44 50-5AB	1 1 unit
			Green	A	8WD44 50-5AC	1 1 unit
			Yellow	A	8WD44 50-5AD	1 1 unit
			Clear	A	8WD44 50-5AE	1 1 unit
			Blue	A	8WD44 50-5AF	1 1 unit
	Blinklight elements	24 AC/DC	Red	A	8WD44 20-5BB	1 1 unit
			Green	A	8WD44 20-5BC	1 1 unit
			Yellow	A	8WD44 20-5BD	1 1 unit
			Clear	X	8WD44 20-5BE	1 1 unit
			Blue	A	8WD44 20-5BF	1 1 unit
		115 AC	Red	A	8WD44 40-5BB	1 1 unit
			Green	A	8WD44 40-5BC	1 1 unit
			Yellow	A	8WD44 40-5BD	1 1 unit
			Clear	A	8WD44 40-5BE	1 1 unit
		Blue	A	8WD44 40-5BF	1 1 unit	
230 AC		Red	A	8WD44 50-5BB	1 1 unit	
		Green	A	8WD44 50-5BC	1 1 unit	
		Yellow	A	8WD44 50-5BD	1 1 unit	
		Clear	A	8WD44 50-5BE	1 1 unit	
		Blue	A	8WD44 50-5BF	1 1 unit	
Rotating light elements	24 AC/DC	Red	A	8WD44 20-5DB	1 1 unit	
		Green	A	8WD44 20-5DC	1 1 unit	
		Yellow	A	8WD44 20-5DD	1 1 unit	
Adapter elements for AS-Interface						
	AS-Interface adapter elements					
	With/without external auxiliary voltage, switchable					
						
	• A/B technology	For 3 signaling elements 24 V DC	Black	A	8WD44 28-0BD	1 1 unit
	• Standard AS-i	For 4 signaling elements 24 V DC	Black	A	8WD44 28-0BE	1 1 unit
Connection elements ¹⁾						
	Connection elements with cover		Black			
	Screw terminals					
	• For mounting on pipes			A	8WD44 08-0AA	1 1 unit
	• For mounting on brackets and floors			A	8WD44 08-0AB	1 1 unit
	Spring-type terminals					
	• For mounting on pipes			A	8WD44 08-0AD	1 1 unit
	• For mounting on brackets and floors			A	8WD44 08-0AE	1 1 unit
	Cover (replacement)			A	8WD44 08-0XA	1 1 unit

¹⁾ The connection element with cover is an essential part for assembling the signaling columns.

Push Button Units and Indicator Lights

8WD4 Signaling Columns

• Revised •
11/15/14

8WD44 signaling columns, 70 mm diameter

Version		DT	Order No.	PU (UNIT, SET, M)	PS
Mounting					
	Foot with pipe	Plastic foot with pipe length 100 mm	A	8WD43 08-0DA	1 1 unit
	Feet, single	Plastic, for mounting on pipes	A	8WD43 08-0DB	1 1 unit
		Metal, for pipe lengths > 400 mm	A	8WD43 08-0DC	1 1 unit
	Adjustable-angle feet for positioning in 7.5° increments ¹⁾	Plastic, for mounting on pipes, incl. rubber seal	X	8WD44 08-0DF	1 1 unit
	Pipes, single	Length 100 mm	A	8WD42 08-0EF	1 1 unit
		Length 150 mm	A	8WD43 08-0EE	1 1 unit
		Length 250 mm	A	8WD43 08-0EA	1 1 unit
		Length 400 mm	A	8WD43 08-0EB	1 1 unit
		Length 1000 mm	A	8WD43 08-0ED	1 1 unit
	Sockets for feet	Side cable outlet (can also be used without feet)	A	8WD43 08-0DD	1 1 unit
		Side cable outlet, with magnetic fixing ²⁾	A	8WD43 08-0DE	1 1 unit
	Brackets for wall mounting (mounting without feet and pipe)	For single-sided mounting	A	8WD43 08-0CA	1 1 unit
		For double-sided mounting	A	8WD43 08-0CB	1 1 unit
	Brackets for mounting with foot		A	8WD44 08-0CC	1 1 unit
	Brackets for base mounting	Mounting without feet and pipe	A	8WD44 08-0CD	1 1 unit
	Adapter for mounting on pipes according to NPT	Mounting on pipes, Ø 25 mm, with NPT 1/2" thread	A	8WD43 08-0DF	1 1 unit

¹⁾ Markings for 30°, 45°, 60° and 90°.

²⁾ For horizontal mounting, only 1 element is recommended.

Note:




For mounting and configuring aid see the publication "Versatile, robust, communication-capable: SIRIUS signaling columns and integrated signal lamps", Order No. E20001-A670-P305.

Push Button Units and Indicator Lights

8WD4 Signaling Columns

8WD44 signaling columns, 70 mm diameter

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Version	Rated voltage	Color	DT	Order No.	PU (UNIT, SET, M)	PS
V						
Lamps						
	Incandescent lamps, 5 W					
	Base BA 15d	24 AC/DC	A	8WD43 28-1XX	1	10 units
		115 AC	A	8WD43 48-1XX	1	10 units
		230 AC	A	8WD43 58-1XX	1	10 units
	LEDs					
	Base BA 15d	24 AC/DC	Red	A 8WD44 28-6XB	1	1 unit
			Green	A 8WD44 28-6XC	1	1 unit
			Yellow	A 8WD44 28-6XD	1	1 unit
			Clear	A 8WD44 28-6XE	1	1 unit
			Blue	A 8WD44 28-6XF	1	1 unit
		115 AC	Red	A 8WD44 48-6XB	1	1 unit
			Green	A 8WD44 48-6XC	1	1 unit
			Yellow	A 8WD44 48-6XD	1	1 unit
			Clear	A 8WD44 48-6XE	1	1 unit
			Blue	A 8WD44 48-6XF	1	1 unit
		230 AC	Red	A 8WD44 58-6XB	1	1 unit
			Green	A 8WD44 58-6XC	1	1 unit
			Yellow	A 8WD44 58-6XD	1	1 unit
			Clear	A 8WD44 58-6XE	1	1 unit
			Blue	A 8WD44 58-6XF	1	1 unit
Inscriptions						
	Labeling panels		A	8WD44 08-0FA	1	1 unit
	With fixing accessories for mounting on pipe Ø 25 mm Inscription area/ step 50 mm x 140 mm Suitable for standard labels, e.g. • Zweckform 3425 • Herma 4457					

Push Button Units and Indicator Lights

8WD53 Beacons

8WD53 beacons, 70 mm diameter

Overview



Integrated signal lamps

Design

Features:

- Thermoplast enclosures, diameter 70 mm
- Degree of protection IP65
- Rated voltage 24 V, 115 V, 230 V AC/DC
- Ambient temperature -20 to +50 °C, incandescent lamp up to 60 °C

The special shape of the integrated signal lamps means that the light is emitted optimally in every direction (to the sides and upwards). Continuous lights (with incandescent lamp or LED) and single-flash lights are available in five colors.






The LED versions of the integrated signal lamps offer a considerably longer endurance than the incandescent lamp versions.

All integrated signal lamps have a high degree of protection IP65 and are made of a material highly resistant to impact.

Mounting

8WD53 integrated signal lamps can be mounted directly at any point of the machine for the purpose of giving visual signals. They are mounted by means of a PG29 screw base with nut.

Selection and ordering data

Version	Rated voltage	Color	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS	PG
V								
Luminaires for incandescent lamps/LED, BA 15d base								
	Continuous light ¹⁾	12 ... 230 AC/DC	Red	A	8WD53 00-1AB	1	1 unit	41J
			Green	A	8WD53 00-1AC	1	1 unit	41J
			Yellow	A	8WD53 00-1AD	1	1 unit	41J
			Clear	A	8WD53 00-1AE	1	1 unit	41J
			Blue	A	8WD53 00-1AF	1	1 unit	41J
Luminaires with integrated flash lamp								
	Single-flash light with integrated electronic flash	24 AC/DC	Red	A	8WD53 20-0CB	1	1 unit	41J
			Green	D	8WD53 20-0CC	1	1 unit	41J
			Yellow	A	8WD53 20-0CD	1	1 unit	41J
			Clear	A	8WD53 20-0CE	1	1 unit	41J
			Blue	A	8WD53 20-0CF	1	1 unit	41J
		115 AC	Red	A	8WD53 40-0CB	1	1 unit	41J
			Green	D	8WD53 40-0CC	1	1 unit	41J
			Yellow	D	8WD53 40-0CD	1	1 unit	41J
			Clear	D	8WD53 40-0CE	1	1 unit	41J
			Blue	D	8WD53 40-0CF	1	1 unit	41J
		230 AC	Red	A	8WD53 50-0CB	1	1 unit	41J
			Green	D	8WD53 50-0CC	1	1 unit	41J
			Yellow	A	8WD53 50-0CD	1	1 unit	41J
			Clear	A	8WD53 50-0CE	1	1 unit	41J
			Blue	D	8WD53 50-0CF	1	1 unit	41J
Luminaires with integrated LED								
	Continuous light	24 AC/DC	Red	A	8WD53 20-5AB	1	1 unit	41J
			Green	A	8WD53 20-5AC	1	1 unit	41J
			Yellow	A	8WD53 20-5AD	1	1 unit	41J
	Blinklight lamps	24 AC/DC	Red	A	8WD53 20-5BB	1	1 unit	41J
			Green	D	8WD53 20-5BC	1	1 unit	41J
			Yellow	A	8WD53 20-5BD	1	1 unit	41J
	Rotating light	24 AC/DC	Red	A	8WD53 20-5DB	1	1 unit	41J
			Green	A	8WD53 20-5DC	1	1 unit	41J
			Yellow	A	8WD53 20-5DD	1	1 unit	41J

For incandescent lamps and LEDs
see "Signaling Columns" page 10/159

¹⁾ Lamp not included in scope of supply. Please order separately.

Push Button Units and Indicator Lights

8WD4 Signaling Columns

Dimension drawings

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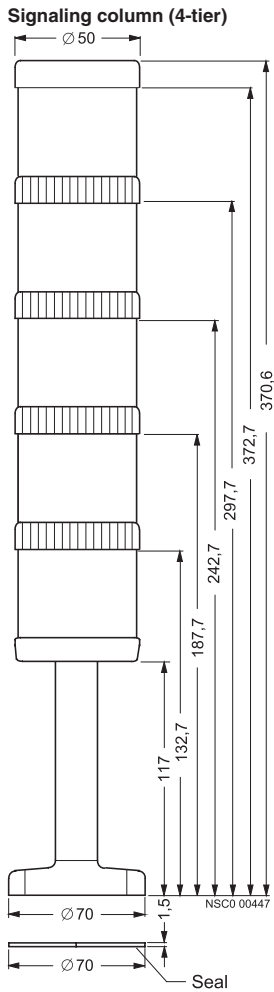
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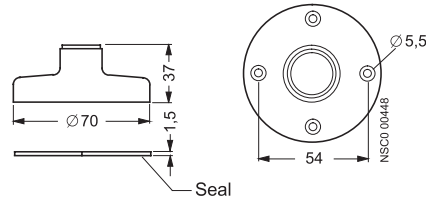
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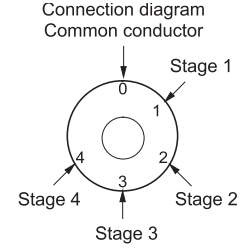
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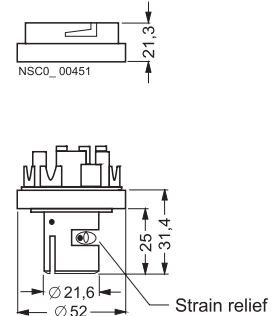
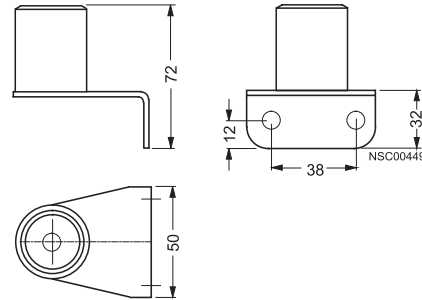
Foot



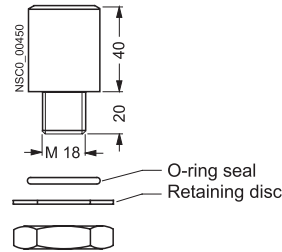
Connection element



Bracket for wall mounting



Adapter for single-hole mounting

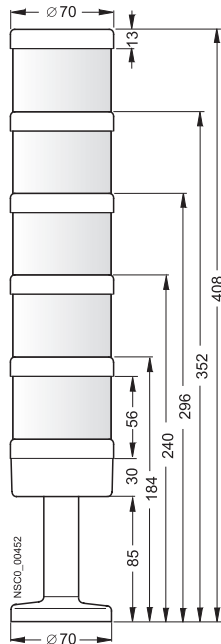


8WD4 Signaling Columns

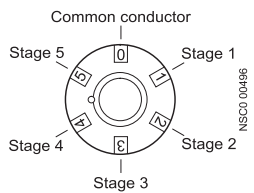
Dimension drawings

Dimension drawings

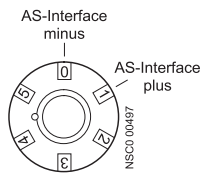
Signaling column (5-tier)



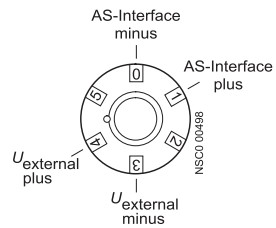
Connection diagrams



conventional

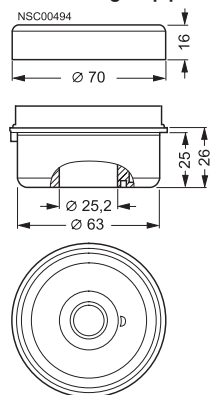


with AS-Interface,
without external auxiliary
voltage

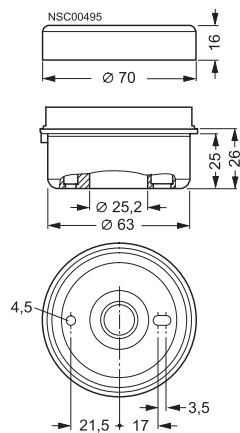


with external auxiliary voltage

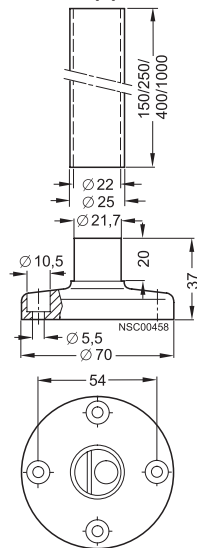
Connection element and cover for mounting on pipes



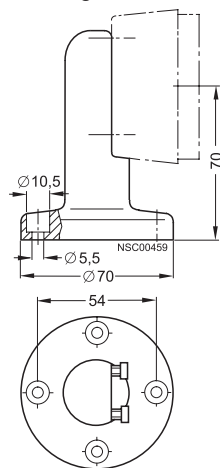
**Connection element and cover
for mounting on floor/bracket**



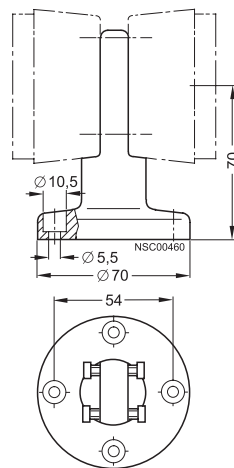
Foot with pipe



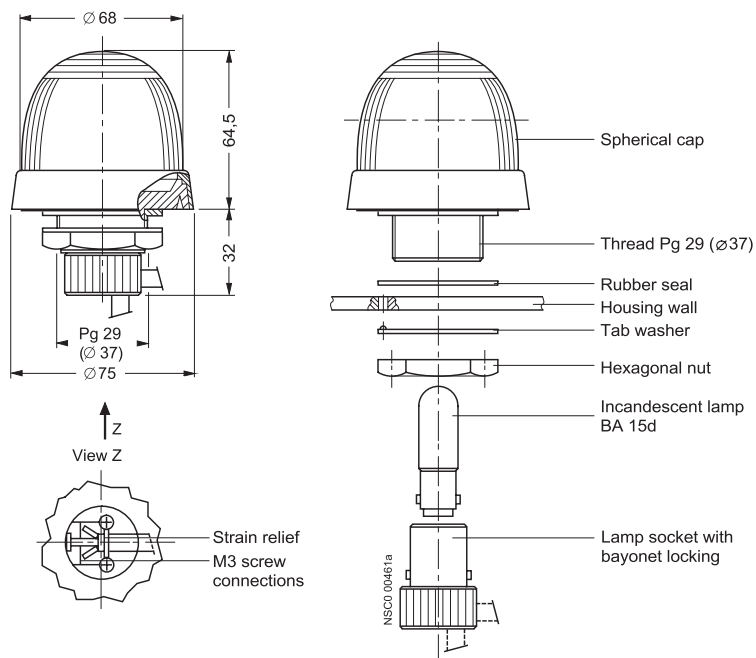
Bracket for single-sided mounting



Bracket for double-sided mounting



Dimension drawings



Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

General

Features

- Snap In Legend Inserts
- Flush and Surface Mounted Types
- Convertible Selector
- Double Break Contacts
- Dual Voltage Pilot Light with Snap In Lens
- Conversion Kits
- UL Listed File #E22655
- CSA Certified File #LR6535

Application

Standard duty control stations are used with magnetic controllers to control the starting, stopping, reversing or speed of applicable motors.

Stations are assembled of one, two or three push button, selector switch or pilot light units in a variety of combinations to provide compact control units for remote control of magnetic starters and contactors.

Station enclosures are available in Type 1 surface mounted, 1B flush plate mounted and 4 watertight.

Features

Type 1 surface mounted bases are constructed of 14 gauge sheet steel, primed and finished in baked gray enamel. The base is predrilled to receive a variety of contact blocks, pilot lights and accessory devices. Covers are of 20 gauge sheet steel, wrap-around construction, primed and finished in baked gray enamel. Siemens Type 4 watertight heavy duty push button stations are supplied with a provision to padlock the stop button in the depressed position. Enclosures are predrilled and tapped for 3/4" conduit.

Contact blocks have double break, fine silver contacts with a NEMA B600 rating. Type 4 stations have a NEMA A600 rating.

The pilot light assembly is dual voltage with clearly marked pressure type terminals for 120 volt or 240 volt connection.

The lens of the pilot light snaps into the cover and is available in both red and green.

Push buttons are equipped with an operator into which a selected legend insert is snapped. Legend inserts are molded thermoplastic and come in a wide variety of legends and colors.

The selector switch operator can be instantly set for two or three positions at any time.

Mushroom Head

50ZMH mounts on any standard push button operator. The Mushroom Head is red molded thermoplastic, 1 1/2" in diameter, and provides a large operator for emergency stop or similar applications.

Mechanical Interlock

50ZAM is a base mounted zinc plate, dichromate dipped, steel assembly. When mounted in conjunction with Duplex Contact Block 50ZAC3 (one NO and one NO) the interlock prevents one contact from being closed while the other contact is closed.

Padlock Attachment Kit

50ZAL can be mounted to any Type 1 surface mounted station by the lower screw which fastens the cover to the station base. Made of heavy steel, chrome plated, the attachment provides for the padlocking of a push button in the depressed position or a selector switch in any position. When used with a push button operator, raised Legend Insert D53493003 (Red Stop) must be used.

Electrical Ratings

NEMA AC Ratings 50/60Hz

Nema B600 5 Continuous Amps

Volts	Make	Break
120	30	3
240	15	1.5
480	7.5	0.75
600	6	0.6
VA	3600	360

Ordering Information

- Legend Inserts [see page 10/171](#).
- Accessories [see page 10/171](#).



**2 Push Buttons
Surface Mounting, NEMA 1**



**2 Push Buttons
Flush Mounting, NEMA 1B**



**1 Push Button
Surface Mounting**



**1 Selector Switch
Flush Mounting**



**2 Push Buttons
1 Selector Switch**






**1 Pilot Light
2 Push Buttons**

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
	A = Momentary flush pushbutton green, surface, label "START"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	50AA3D	1
	A = Momentary flush pushbutton red, surface, label "STOP"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	50AA3E	1
	A = Momentary raised pushbutton red, surface, label "STOP"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	50AA3F	1
	A = Momentary mushroom head red, surface, label "STOP"	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	50AA3G	1
	A = Momentary flush pushbutton less insert, surface	NEMA 1	1NO - 1NC with common jumper (50ZAC1)	1	50AA3A	1
	A = 3 position selector switch, surface, label "HAND-OFF-AUTO"	NEMA 1	2 NO 2SPST (50ZAC8)	1	50AA3C3	1
	A = 2 position selector switch, surface, label "Off-On"	NEMA 1	2 NO 2SPST (50ZAC8)	1	50AA3C6	1
	A = 2/3 selector switch, surface, multiple legends	NEMA 1	2 NO 2SPST (50ZAC8)	1	50AA3B9	1
	A = Indicator light, red, surface	NEMA 1	120/240V dual voltage 120PSB lamp	1	50BA3Y	1
	A = Indicator light, green, surface	NEMA 1	120/240V dual voltage 120PSB lamp	1	50BA3Z	1
	A = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage 120PSB lamp	1	50BA32	1
	A = Momentary flush pushbutton green, flush, label "START"	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	50AA2D	1
	A = Momentary flush pushbutton red, flush, label "STOP"	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	50AA2E	1
	A = Momentary raised pushbutton red, flush, label "STOP"	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	50AA2F	1
	A = Momentary flush pushbutton less insert, flush	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	50AA2A	1
	A = Momentary flush pushbutton less insert, flush, chrome plate	NEMA 1B	1NO - 1NC with common jumper (50ZAC1)	1	50AA6A	1
	A = 3 position selector switch, flush, label "HAND-OFF-AUTO"	NEMA 1B	2 NO 2SPST (50ZAC8)	1	50AA2C3	1
	A = 3 position selector switch, flush, label "Off-On"	NEMA 1B	2 NO 2SPST (50ZAC8)	1	50AA2C6	1
	A = 2/3 selector switch, multiple legends, flush	NEMA 1B	2 NO 2SPST (50ZAC8)	1	50AA2B9	1
	A = 2/3 selector switch, multiple legends, chrome plate, flush	NEMA 1B	2 NO 2SPST (50ZAC8)	1	50AA6B9	1
	A = Indicator light, red, flush	NEMA 1B	120/240V dual voltage	1	50BA2Y	1
	A = Indicator light, green, flush	NEMA 1B	120/240V dual voltage	1	50BA2Z	1
	A = Indicator light, less lens, flush	NEMA 1B	120/240V dual voltage	1	50BA22	1
	A = Indicator light, less lens, chrome plate, flush	NEMA 1B	120PSB lamp	1	50BA62	1
	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC2)	2	50CA3DE	1
	A = Momentary pushbutton red, surface, label "STOP"					
	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC2)	2	50CA3DF	1
	A = Momentary raised pushbutton red, surface, label "STOP"					
	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC2)	2	50CA3DG	1
	A = Momentary mushroom head pushbutton red, surface, label "STOP"					
	B = Momentary pushbutton, less insert, surface	NEMA 1	1NO, 1NC (50ZAC2)	2	50CA3AA	1
	A = Momentary pushbutton, less insert, surface					
	B = Momentary pushbutton, surface, label "FORWARD"	NEMA 1	2 NO (50ZAC3)	2	50DA3KL	1
	A = Momentary pushbutton, surface, label "REVERSE"					

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
2 unit surface mount-momentary pushbutton	B = Momentary pushbutton, surface, label "OPEN" A = Momentary pushbutton, surface, label "CLOSE"	NEMA 1	2 NO (50ZAC3)	2	50DA3HJ	1
	B = Momentary pushbutton, surface, label "UP" A = Momentary pushbutton, surface, label "DOWN"	NEMA 1	2 NO (50ZAC3)	2	50DA3NP	1
	B = Momentary pushbutton, surface, less insert A = Momentary pushbutton, surface, less insert	NEMA 1	2 NO (50ZAC3)	2	50DA3AA	1
	B = Momentary pushbutton, surface, label "FORWARD" A = Momentary pushbutton, surface, label "REVERSE"	NEMA 1	2 NO mechanically inter-locked (50ZA3C w/ 50ZAM)	2	50RA3KL	1
	B = Momentary pushbutton, surface, label "OPEN" A = Momentary pushbutton, surface, label "CLOSE"	NEMA 1	2 NO mechanically inter-locked (50ZA3C w/ 50ZAM)	2	50RA3HJ	1
	B = Momentary pushbutton, surface, label "UP" A = Momentary pushbutton, surface, label "DOWN"	NEMA 1	2 NO mechanically inter-locked (50ZA3C w/ 50ZAM)	2	50RA3NP	1
	B = Momentary pushbutton, surface, label "ON" A = Momentary pushbutton, surface, label "OFF"	NEMA 1	2 NO mechanically inter-locked (50ZA3C w/ 50ZAM)	2	50RA334	1
	B = Momentary pushbutton, less insert surface A = Momentary pushbutton, less insert, surface	NEMA 1	2 NO mechanically inter-locked (50ZA3C w/ 50ZAM)	2	50RA3AA	1
	B = Momentary pushbutton, surface, label "FORWARD" A = Momentary pushbutton, surface, label "REVERSE"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	50EA3KL	1
	B = Momentary pushbutton, surface, label "OPEN" A = Momentary pushbutton, surface, label "CLOSE"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	50EA3HJ	1
	B = Momentary pushbutton, surface, label "UP" A = Momentary pushbutton, surface, label "DOWN"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	50EA3NP	1
	B = Momentary pushbutton, surface, label "ON" A = Momentary pushbutton, surface, label "OFF"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	50EA334	1
	B = Momentary pushbutton, surface, less insert A = Momentary pushbutton, surface, less insert	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	2	50EA3AA	1
	B = Momentary pushbutton green, flush, label "START" A = Momentary pushbutton red, flush, label "STOP"	NEMA 1B	1NO, 1NC (50ZAC2)	2	50CA2DE	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	1NO, 1NC (50ZAC2)	2	50CA2AA	1
2 unit flush mount-momentary pushbutton	B = Momentary pushbutton green, flush, label "START" A = Momentary raised pushbutton red, flush, label "STOP"	NEMA 1B	1NO, 1NC (50ZAC2)	2	50CA2DF	1
	B = Momentary pushbutton green, flush, label "START" A = Momentary mushroom head pushbutton red, flush, label "STOP"	NEMA 1B	1NO, 1NC (50ZAC2)	2	50CA2DG	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	1NO, 1NC (50ZAC2)	2	50CA6AA	1

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA A600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
2 unit flush mount-momentary pushbutton	B = Momentary pushbutton, flush, label "FORWARD" A = Momentary pushbutton, flush, label "REVERSE"	NEMA 1B	2 NO (50ZAC3)	2	50DA2KL	1
	B = Momentary pushbutton, flush, label "OPEN" A = Momentary pushbutton, flush, label "CLOSE"	NEMA 1B	2 NO (50ZAC3)	2	50DA2HJ	1
	B = Momentary pushbutton, flush, label "UP" A = Momentary pushbutton, flush, label "DOWN"	NEMA 1B	2 NO (50ZAC3)	2	50DA2NP	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	2 NO (50ZAC3)	2	50DA2AA	1
	B = Momentary pushbutton, less insert, chrome plate, flush A = Momentary pushbutton, less insert, chrome plate, flush	NEMA 1B	2 NO (50ZAC3)	2	50DA6AA	1
	B = Momentary pushbutton, flush, label "FORWARD" A = Momentary pushbutton, flush, label "REVERSE"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA2KL	1
	B = Momentary pushbutton, flush, label "OPEN" A = Momentary pushbutton, flush, label "CLOSE"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA2HJ	1
	B = Momentary pushbutton, flush, label "UP" A = Momentary pushbutton, flush, label "DOWN"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA2NP	1
	B = Momentary pushbutton, flush, label "ON" A = Momentary pushbutton, flush, label "OFF"	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA234	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA2AA	1
	B = Momentary pushbutton, less insert, chrome plate, flush A = Momentary pushbutton, less insert, chrome plate, flush	NEMA 1B	2 NO mechanically interlocked (50ZA3C w/ 50ZAM)	2	50RA6AA	1
	B = Momentary pushbutton, flush, label "FORWARD" A = Momentary pushbutton, flush, label "REVERSE"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA2KL	1
	B = Momentary pushbutton, flush, label "OPEN" A = Momentary pushbutton, flush, label "CLOSE"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA2HJ	1
	B = Momentary pushbutton, flush, label "UP" A = Momentary pushbutton, flush, label "DOWN"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA2NP	1
	B = Momentary pushbutton, flush, label "ON" A = Momentary pushbutton, flush, label "OFF"	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA234	1
	B = Momentary pushbutton, less insert, flush A = Momentary pushbutton, less insert, flush	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA2AA	1
	B = Momentary pushbutton, less insert, chrome plate, flush A = Momentary pushbutton, less insert, chrome plate, flush	NEMA 1B	2 NO, 2 NC (2 - 50ZAC2)	2	50EA6AA	1

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
2 unit surface mount-momentary pushbutton and selector switch	B = Momentary pushbutton green, surface, label "START"	NEMA 1	1NO, 1NC (50ZAC1)	2	50FA3DC3	1
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Momentary pushbutton less insert, surface	NEMA 1	1NO, 1NC (50ZAC1)	2	50FA3AB9	1
	A = Maintained selector switch, multiple legends, surface		2 NO 2SPDT w/ common jumper (50ZAC8)			
2 unit surface mount-momentary pushbutton and indicator light	B = Indicator light, red, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	50HA3YC3	1
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, red, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	50HA32B9	1
	A = Maintained selector switch, multiple legends, surface		2 NO 2SPDT w/ common jumper (50ZAC8)			
2 unit surface mount-momentary pushbutton and indicator light	B = Indicator light, green, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	50GA3ZY	1
	A = Indicator light, red, surface					
	B = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage (120PSB lamp)	2	50GA322	1
	A = Indicator light, less lens, surface					
2 unit flush mount-momentary pushbutton and selector switch	B = Momentary pushbutton green, flush, label "START"	NEMA 1B	1NO, 1NC (50ZAC1)	2	50FA2DC3	1
	A = Maintained selector switch, flush, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Momentary pushbutton less insert, flush	NEMA 1B	1NO, 1NC (50ZAC1)	2	50FA2AB9	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Momentary pushbutton less insert chrome plate, flush	NEMA 1B	1NO, 1NC (50ZAC1)	2	50FA6AB9	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, red, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50HA2YC3	1
	A = Maintained selector switch, flush, label "HAND-OFF-AUTO"		2 NO 2SPDT w/ common jumper (50ZAC8)			
2 unit flush mount-momentary pushbutton and indicator light	B = Indicator light, less lens, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50HA22B9	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, less lens, chrome plate, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50HA62B9	1
	A = Maintained selector switch, multiple legends, flush		2 NO 2SPDT w/ common jumper (50ZAC8)			
	B = Indicator light, green, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50GA2ZY	1
	A = Indicator light, red, flush					
	B = Indicator light, less lens, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50GA222	1
	A = Indicator light, less lens, flush					
2 unit flush mount-momentary pushbutton and indicator light	B = Indicator light, less lens, chrome plate, flush	NEMA 1B	120/240V dual voltage (120PSB lamp)	2	50GA622	1
	A = Indicator light, less lens, chrome plate, flush					
3 unit surface mount-momentary pushbutton	C = Momentary pushbutton, surface, label "FORWARD"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	3	50MA3KLE	1
	B = Momentary pushbutton, surface, label "REVERSE"		1NO - 1NC with common jumper (50ZAC1)			
	A = Momentary pushbutton, surface, label "STOP"					
	C = Momentary pushbutton, surface, label "UP"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	3	50MA3NPE	1
3 unit surface mount-momentary pushbutton	B = Momentary pushbutton, surface, label "DOWN"		1NO - 1NC with common jumper (50ZAC1)			
	A = Momentary pushbutton, surface, label "STOP"					
	C = Momentary pushbutton, surface, label "OPEN"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2)	3	50MA3HJE	1
	B = Momentary pushbutton, surface, label "CLOSE"		1NO - 1NC with common jumper (50ZAC1)			
3 unit surface mount-momentary pushbutton	A = Momentary pushbutton, surface, label "STOP"					

Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

5A 600V AC NEMA B600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
3 unit surface mount-momentary pushbutton	C = Momentary pushbutton, surface, label "FAST"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	50MA3TUE	1
	B = Momentary pushbutton, surface, label "SLOW"					
	A = Momentary pushbutton, surface, label "STOP"					
	C = Momentary pushbutton, surface, label "START"	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	50MA3DME	1
	B = Momentary pushbutton, surface, label "JOG"					
	A = Momentary pushbutton, surface, label "STOP"					
	C = Momentary pushbutton, surface, label less insert	NEMA 1	2 NO, 2 NC (2 - 50ZAC2) 1NO - 1NC with common jumper (50ZAC1)	3	50MA3AAA	1
	B = Momentary pushbutton, surface, label less insert					
	A = Momentary pushbutton, surface, label less insert					
3 unit surface mount-momentary pushbutton and selector switch	C = Momentary pushbutton, surface, label "START"	NEMA 1	1 NO, 1 NC (50ZAC2) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50LA3DEC3	1
	B = Momentary pushbutton, surface, label "STOP"					
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"					
	C = Momentary pushbutton, less insert, surface	NEMA 1	1 NO, 1 NC (50ZAC2) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50LA3AAB9	1
	B = Momentary pushbutton, less insert, surface					
	A = Maintained selector switch, multiple legends, surface					
3 unit surface mount-momentary pushbutton and indicator light	C = Indicator light, red, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	50JA3YDE	1
	B = Momentary pushbutton, surface, label "START"					
	A = Momentary pushbutton, surface, label "STOP"					
	C = Indicator light, green, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	50JA3ZDE	1
	B = Momentary pushbutton, surface, label "START"					
	A = Momentary pushbutton, surface, label "STOP"					
	C = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 1 NO, 1 NC (50ZAC2)	3	50JA32AA	1
	B = Momentary pushbutton, less insert, surface					
	A = Momentary pushbutton, less insert, surface					
	C = Indicator light, green, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50NA3ZYC3	1
	B = Indicator light, red, surface					
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"					
	C = Indicator light, less lens, surface	NEMA 1	120/240V dual voltage (120PSB lamp) 2 NO, 2 SPST with common jumper (50ZAC8)	3	50NA322B9	1
	B = Indicator light, less lens, surface					
	A = Maintained selector switch, multiple legends, surface					






Pushbutton Units and Indicator Lights

Class 50 Standard Duty Pushbutton Stations

Heavy duty - 10A 600V AC NEMA A600

Selection and ordering data

	Operator identification	Degree of protection	Contacts / voltage	Number of command points	Order No.	Packs
						Unit
	A = Momentary pushbutton green, surface, label "START"	NEMA 4	1NO - 1NC	1	50HA1E1	1
	A = Momentary pushbutton red, surface, label "STOP"	NEMA 4	1NO - 1NC	1	50HA1E2	1
	A = Momentary pushbutton green, surface, label "RESET"	NEMA 4	1NO - 1NC	1	50HA1E4	1
	A = Momentary pushbutton green, surface, label "JOG"	NEMA 4	1NO - 1NC	1	50HA1E5	1
	A = Maintained selector switch, surface, label "SAFE-RUN"	NEMA 4	1NO - 1NC	1	50HA1E6	1
	A = Maintained selector switch, surface, label "OFF-ON"	NEMA 4	1NO - 1NC	1	50HA1E7	1
	A = Maintained selector switch, surface, label "JOG-RUN"	NEMA 4	1NO - 1NC	1	50HA1E8	1
	A = Maintained selector switch, surface, label "HAND-OFF-AUTO"	NEMA 4	1NO - 1NC	1	50HA1E9	1
	B = Momentary pushbutton green, surface, label "START"	NEMA 4	1NO - 1NC	2	50HA2E1	1
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC			
	B = Momentary pushbutton green, surface, label "FORWARD"	NEMA 4	1NO - 1NC	2	50HA2E2	1
	A = Momentary pushbutton red, surface, label "REVERSE"		1NO - 1NC			
	B = Momentary pushbutton green, surface, label "UP"	NEMA 4	1NO - 1NC	2	50HA2E3	1
	A = Momentary pushbutton red, surface, label "DOWN"		1NO - 1NC			
	B = Momentary pushbutton green, surface, label "OPEN"	NEMA 4	1NO - 1NC	2	50HA2E4	1
	A = Momentary pushbutton red, surface, label "CLOSE"		1NO - 1NC			
	B = Momentary pushbutton green, surface, label "FAST"	NEMA 4	1NO - 1NC	2	50HA2E5	1
	A = Momentary pushbutton red, surface, label "SLOW"		1NO - 1NC			
	C = Momentary pushbutton green, surface, label "FORWARD"	NEMA 4	1NO - 1NC	3	50HA3E1	1
	B = Momentary pushbutton green, surface, label "REVERSE"		1NO - 1NC			
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC			
	C = Momentary pushbutton green, surface, label "UP"	NEMA 4	1NO - 1NC	3	50HA3E2	1
	B = Momentary pushbutton green, surface, label "DOWN"		1NO - 1NC			
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC			
	C = Momentary pushbutton green, surface, label "OPEN"	NEMA 4	1NO - 1NC	3	50HA3E3	1
	B = Momentary pushbutton green, surface, label "CLOSE"		1NO - 1NC			
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC			
	C = Momentary pushbutton green, surface, label "START"	NEMA 4	1NO - 1NC	3	50HA3E9	1
	B = Momentary pushbutton green, surface, label "JOG"		1NO - 1NC			
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC			
	C = Momentary pushbutton green, surface, label "FAST"	NEMA 4	1NO - 1NC	3	50HA3E4	1
	B = Momentary pushbutton green, surface, label "SLOW"		1NO - 1NC			
	A = Momentary pushbutton red, surface, label "STOP"		1NO - 1NC			

Pushbutton Units and Indicator Lights





Class 50 Standard Duty Pushbutton Stations

Standard duty station accessories

Selection and ordering data

Legend inscription insert for snap-on mounting

Inscription	Color	Order No.	Pack
			Unit
Close	Orange	50D53493005	1
Down	Orange	50D53493010	1
Fast	Black	50D53493013	1
Forward	Green	50D53493006	1
High	Black	50D53493015	1
Hoist	Green	50D53493011	1
Jog	Black	50D53493008	1
Low	Black	50D53493016	1
Lower	Orange	50D53493012	1
Off	Red	50D53493018	1
On	Green	50D53493017	1
Open	Green	50D53493004	1
Reverse	Orange	50D53493007	1
Slow	Black	50D53493014	1
Start	Green	50D53493001	1
Stop	Red	50D53493002	1
Stop (raised)	Red	50D53493003	1
Up	Green	50D53493009	1

		Version	Suitable for	Color	Order No.	Pack
						Unit
 50ZAC1	 50ZAC2	Mushroom head		Red	50ZMH	1
		Padlock attachment	Used only for raised buttons		50ZAL	1
		Mechanical interlock kit			50ZAM	1
 50ZAC8	 50ZAC3	Contact blocks				
		1NO, 1NC	Single button		50ZAC1	1
		2NO, 2SPST	Selector switch		50ZAC8	1
		1NO, 1NC	Two button		50ZAC2	1
		1NO, 1NO	Two button		50ZAC3	1
		Pilot light	120/240V Dual Voltage, no lens		50ZAC6	1
		Pilot light lens		Red	50ZPL01	1
				Green	50ZPL02	1
		Replacement lamps	Class 50 type 1, 1B 120V		50D21983001	1
		Slide base, lamp type 120PSB				

Heavy duty station accessories

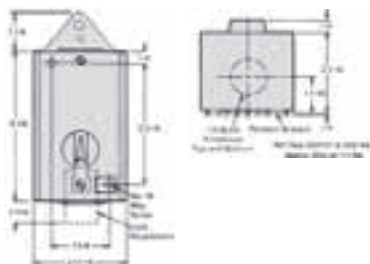
Version	Suitable for	Color	Order No.	Pack
				Unit
Pushbutton caps	NEMA 4 control stations	Red	BHP15X	1
	NEMA 4 control stations	Black	BHP16X	1

Pushbutton Units and Indicator Lights

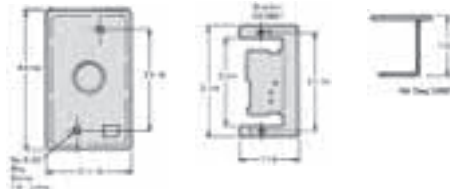
Class 50 Standard Duty Pushbutton Stations

Standard duty - 5A 600V AC NEMA B600

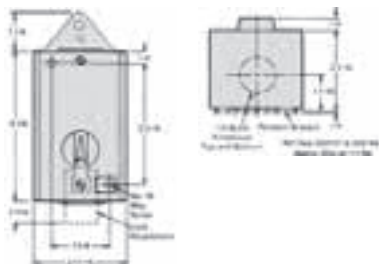
1 Unit Station Surface Mounting—Type 1



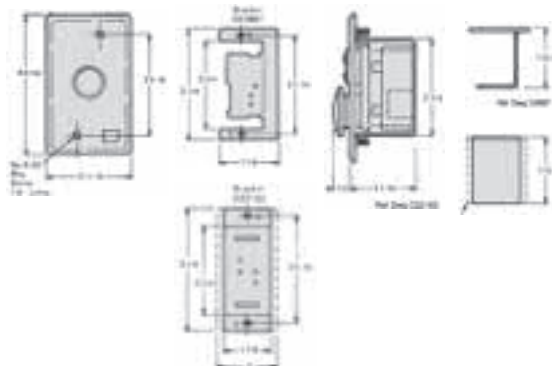
1 Unit Station Flush Mounting—Type 1B



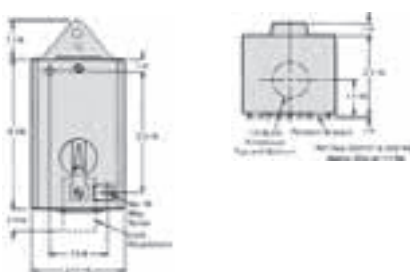
2 Pushbutton Stations Surface Mounting—Type 1



2 Pushbutton Stations Flush Mounting—Type 1B



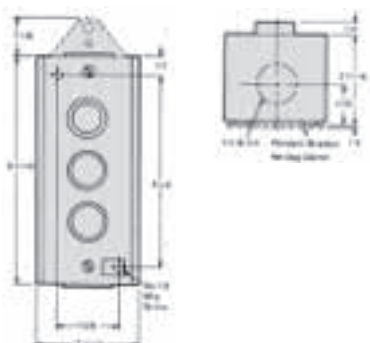
2 Unit Stations Surface Mounting—Type 1



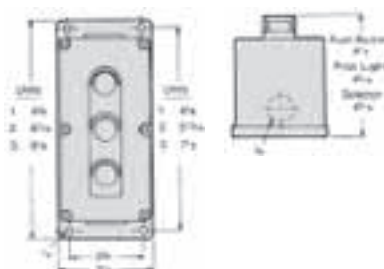
2 Unit Station Flush Mounting—Type 1B



3 Unit Stations Surface Mounting



1 Unit Stations—Type 4



Features

- UL Listed and cUL Listed for Class I, Groups C & D and Class II, Groups E, F & G
- Short or Long Bushing Lengths
- Mount into 3/4-14 NPSM Threaded Hole
- Sealing Lock Nut
- Similar in Appearance to Class 52 Oil Tight Pilot Devices
- Double Break Bifurcated Contacts Rated AC NEMA A600, DC NEMA P600
- ⚡ Positively Driven Contacts
- Touchsafe Terminals
- UL Listed File # E39935

Application

When properly installed in a Type 7 & 9 enclosure, these components meet the National Electrical Code's requirements for Class I, Division 1 & 2, Groups C and D hazardous gases, Class II, Division 1, Groups E, F and G hazardous dust, and Class III, hazardous fibers and flyings. Class 51 pilot devices may be used in a location where the presence of flammable gases, vapors or finely pulverized dusts in the atmosphere are sufficient to create a threat of explosion or fire. They may also be required where easily ignitable fibers or flyings are present. Short bushing units are used in most standard Type 7 & 9 enclosures. Long bushings are used when an additional front panel is required or in enclosures up to 2 V8 inches thick. Class 51 devices also meet Type 4 applications.

Rugged

Hazardous location control units are durable one piece castings of a corrosion resistant copper free aluminum alloy with stainless steel springs and type 316 stainless steel shafts to provide a long dependable life. The "O" ring ensures the longest seal life available. Contact blocks have double break bifurcated contacts for increased reliability.

Flexible

Control units mount into industry standard 3/4-14 NPSM threaded holes. Both short bushings for enclosure mounting and long bushings for panel mounting are available.

Pilot light bulbs are removable from the front for ease of maintenance. Many common parts between the Class 51 hazardous location pilot devices and the Class 52 oil tight pilot devices allow for increased serviceability with fewer parts.

Industrial Appearance

Hazardous location control units add luster to panels. They are uniform in appearance and match 52 Class oil tight pilot devices.

Typical Applications

Class I

Class II

Class III

Electrical Ratings

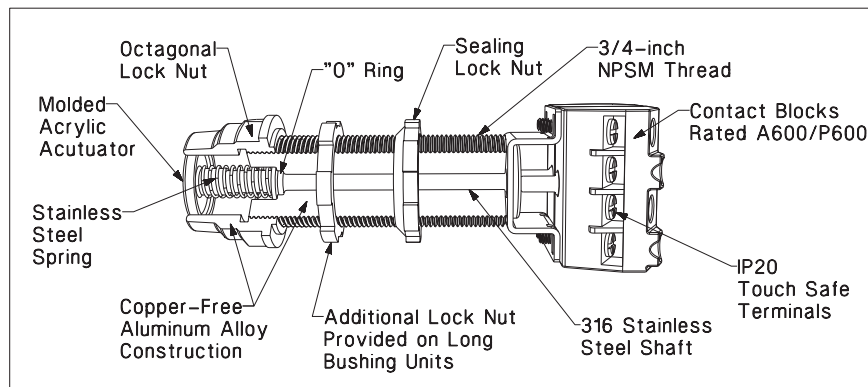
NEMA AC Ratings 50/60Hz

Nema A600 10 Continuous Amps

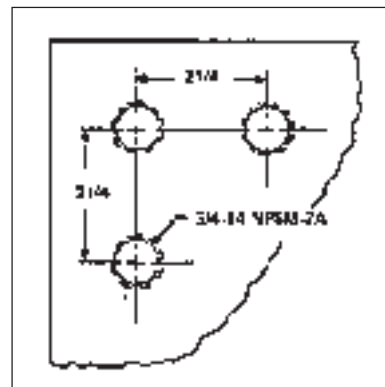
Volts	Make	Break
120	60	6
240	30	3
480	15	1.5
600	12	1.2
VA	7200	720

Ordering Information

- Accessories [see page 10/181-10/182](#).
- Selector Operating Position and Contact Operation [page 10/179](#).
- Legend Plates [see page 10/218](#).
- Enclosures [see page 10/180](#).
- Technical Specifications: [page 10/220](#).



Panel Spacing








Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Operators only

Selection and ordering data



	Version	Color of operator	Contacts	Short bushing Order No.	Long bushing Order No.	Pack Unit
Pushbutton with flat cap 	Pushbutton with flush cap	Black		51PA8A1	51PA8A1LB	1
		Red		51PA8A2	51PA8A2LB	1
		Green		51PA8A3	51PA8A3LB	1
Pushbutton with extended cap 	Pushbutton with extended cap	Black		51PA8B1	51PA8B1LB	1
		Red		51PA8B2	51PA8B2LB	1
		Green		51PA8B3	51PA8B3LB	1
Dual pushbutton 	Dual Pushbutton	Flush Black		51PD8A1B2	51PD8A1B2LB	1
		Raised Red				
	Pushbutton with mushroom cap 1 5/8"(41.3mm)	Black		51PA9D1	51PA9D1LB	1
		Red		51PA9D2	51PA9D2LB	1
		Green		51PA9D3	51PA9D3LB	1
	Pushbutton with mushroom cap 2 1/2"(63.5mm)	Black		51PA9E1	51PA9E1LB	1
		Red		51PA9E2	51PA9E2LB	1
		Green		51PA9E3	51PA9E3LB	1
		Less head		51PA9	51PA9LB	1
2 position push-pull 	2 Position Push Pull Maintained, Non Illuminated Small Plastic Mushroom Head, 1 5/8" (41.3 mm)	Black		51PA2D1	51PA2D1LB	1
		Red		51PA2D2	51PA2D2LB	1
		Green		51PA2D3	51PA2D3LB	1
	Large Plastic Mushroom Head, 2 1/4" (57.2 mm)	Black		51PA2E1	51PA2E1LB	1
		Red		51PA2E2	51PA2E2LB	1
		Green		51PA2E3	51PA2E3LB	1
		Less head		51PA2	51PA2LB	1
	2 Position Push Pull Maintained, Non Illuminated Small Mushroom Head, 1 5/8"(41.3mm)	Black	1NC + 1NO	51PA2D1A	51PA2D1LBA	1
		Red	1NC + 1NO	51PA2D2A	51PA2D2LBA	1
		Green	1NC + 1NO	51PA2D3A	51PA2D3LBA	1
	Large Mushroom Head, 2 1/2"(63.5mm)	Black	1NC + 1NO	51PA2E1A	51PA2E1LBA	1
		Red	1NC + 1NO	51PA2E2A	51PA2E2LBA	1
		Green	1NC + 1NO	51PA2E3A	51PA2E3LBA	1
3 position push-pull 	3 Position Push Pull Momentary, Non Illuminated Small Mushroom Head, 1 5/8"(41.3mm)	Black	1NC + 1NO	51PA3A1U	51PA3A1ULB	1
		Red	1NC + 1NO	51PA3A2U	51PA3A2ULB	1
		Green	1NC + 1NO	51PA3A3U	51PA3A3ULB	1

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Indicator light

Selection and ordering data

	Version	Color of operator	Contacts	Short bushing Order No.	Long bushing Order No.	Pack
 Indicator light- full voltage	Indicator light with glass lens - Full voltage type AC/DC (with 6" pigtail leads) ^{1) 3)} Operators with Incandescent Lamp 6-8V with 755 type	Red Green Amber Less lens		51PC5B2 51PC5B3 51PC5B9 51PC5BN	51PC5B2LB 51PC5B3LB 51PC5B9LB 51PC5BNLB	1
	12V with 756 type	Red Green Amber Less lens		51PC5C2 51PC5C3 51PC5C9 51PC5CN	51PC5C2LB 51PC5C3LB 51PC5C9LB 51PC5CNLB	1
	24V with 757 type	Red Green Amber Less lens		51PC5D2 51PC5D3 51PC5D9 51PC5DN	51PC5D2LB 51PC5D3LB 51PC5D9LB 51PC5DNLB	1
	Operators with LED Lamp ²⁾ 6-8V with BA9 type LED	Red Green Amber		51PE5B2 51PE5B3 51PE5B9	51PE5B2LB 51PE5B3LB 51PE5B9LB	1
	24V with BA9 type LED	Red Green Amber		51PE5D2 51PE5D3 51PE5D9	51PE5D2LB 51PE5D3LB 51PE5D9LB	1
	Indicator light with glass lens - Transformer type AC/DC ^{1) 3)} Operators with Incandescent Lamp 120V with 6V 755 type lamp	Red Green Amber Less lens		51PC5G2 51PC5G3 51PC5G9 51PC5GN	51PC5G2LB 51PC5G3LB 51PC5G9LB 51PC5GNLB	1
	240V with 6V 755 type lamp	Red Green Amber Less lens		51PC5H2 51PC5H3 51PC5H9 51PC5HN	51PC5H2LB 51PC5H3LB 51PC5H9LB 51PC5HNLB	1
	480V with 6V 755 type lamp	Red Green Amber Less lens		51PC5J2 51PC5J3 51PC5J9 51PC5JN	51PC5J2LB 51PC5J3LB 51PC5J9LB 51PC5JNLB	1
	600V with 6V 755 type lamp	Red Green Amber Less lens		51PC5K2 51PC5K3 51PC5K9 51PC5KN	51PC5K2LB 51PC5K3LB 51PC5K9LB 51PC5KNLB	1
	Operators with LED Lamp ²⁾ 120V with 6V BA9 type LED	Red Green Amber Less lens		51PE5G2 51PE5G3 51PE5G9 —	51PE5G2LB 51PE5G3LB 51PE5G9LB —	1
	240V with 6V BA9 type LED	Red Green Amber Less lens		51PE5H2 51PE5H3 51PE5H9 —	51PE5H2LB 51PE5H3LB 51PE5H9LB —	1
	480V with 6V BA9 type LED	Red Green Amber Less lens		51PE5J2 51PE5J3 51PE5J9 —	51PE5J3LB 51PE5J3LB 51PE5J9LB —	1
600V with 6V BA9 type LED	Red Green Amber Less lens		51PE5K2 51PE5K3 51PE5K9 —	51PE5K2LB 51PE5K3LB 51PE5K9LB —	1	
 Indicator light- transformer type	Indicator light with glass lens - Resistor type AC/DC* 120V with 24V 757 type lamp	Red Green Amber Less lens		51PC5M2 51PC5M3 51PC5M9 51PC5MN	51PC5M2LB 51PC5M3LB 51PC5M9LB 51PC5MNLB	1
	120V with 24V BA9 type LED lamp ²⁾	Red Green Amber		51PE5M2 51PE5M3 51PE5M9	51PE5M2LB 51PE5M3LB 51PE5M9LB	1

1) For other colors not listed, order operator less lens and separate lens from page 10/127.

2) LED color must match lens color.



3) All illuminated devices come with std. Touch-safe shield per UL stds.

Pushbutton Units and Indicator Lights



Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Push to test complete units

Selection and ordering data

	Version	Color of operator	Contacts	Short bushing Order No.	Long bushing Order No.	Pack
						Unit
Push to test full voltage 	Push to test/Illuminated pushbutton with glass lens - Full voltage type AC/DC ^{1) 3)} Operators with Incandescent Lamp 6V with 755 type lamp	Red	1NO + 1NC	51PC6B2A	51PC6B2ALB	1
		Green	1NO + 1NC	51PC6B3A	51PC6B3ALB	1
		Amber	1NO + 1NC	51PC6B9A	51PC6B9ALB	1
		Less lens	1NO + 1NC	51PC6BNA	51PC6BNALB	1
		24V with 757 type lamp	Red	51PC6D2A	51PC6D2ALB	1
	Operators with LED Lamp ²⁾ 6-8V with BA9 type LED	Amber	1NO + 1NC	51PC6D3A	51PC6D3ALB	1
		Green	1NO + 1NC	51PC6D9A	51PC6D9ALB	1
		Less lens	1NO + 1NC	51PC6DNA	51PC6DNALB	1
		24V with BA9 type LED	Red	51PE6D2A	51PE6D2ALB	1
		Green	1NO + 1NC	51PE6D3A	51PE6D3ALB	1
		Amber	1NO + 1NC	51PE6D9A	51PE6D9ALB	1
Push to test transformer type 	Push to test/Illuminated pushbutton with glass lens - Transformer type (50/60 Hz) ^{1) 3)} Operators with Incandescent Lamp 120V with 6V 755 type lamp	Red	1NO + 1NC	51PC6G2A	51PC6G2ALB	1
		Green	1NO + 1NC	51PC6G3A	51PC6G3ALB	1
		Amber	1NO + 1NC	51PC6G9A	51PC6G9ALB	1
		Less lens	1NO + 1NC	51PC6GNA	51PC6GNALB	1
		240V with 6V 755 type lamp	Red	51PC6H2A	51PC6H2ALB	1
	Operators with LED Lamp ²⁾ 120V with 6V BA9 type LED	Green	1NO + 1NC	51PC6H3A	51PC6H3ALB	1
		Amber	1NO + 1NC	51PC6H9A	51PC6H9ALB	1
		Less lens	1NO + 1NC	51PC6HNA	51PC6HNALB	1
		480V with 6V 755 type lamp	Red	51PC6J2A	51PC6J2ALB	1
		Green	1NO + 1NC	51PC6J3A	51PC6J3ALB	1
	600V with 6V 755 type lamp	Amber	1NO + 1NC	51PC6J9A	51PC6J9ALB	1
		Less lens	1NO + 1NC	51PC6JNA	51PC6JNALB	1
		Red	1NO + 1NC	51PC6K2A	51PC6K2ALB	1
		Green	1NO + 1NC	51PC6K3A	51PC6K3ALB	1
		Amber	1NO + 1NC	51PC6K9A	51PC6K9ALB	1
		Less lens	1NO + 1NC	51PC6KNA	51PC6KNALB	1
	Operators with LED Lamp ²⁾ 120V with 6V BA9 type LED	Red	1NO + 1NC	51PE6G2A	51PE6G2ALB	1
		Green	1NO + 1NC	51PE6G3A	51PE6G3ALB	1
		Amber	1NO + 1NC	51PE6G9A	51PE6G9ALB	1
		240V with 6V BA9 type LED	Red	51PE6H2A	51PE6H2ALB	1
		Green	1NO + 1NC	51PE6H3A	51PE6H3ALB	1
	480V with 6V BA9 type LED	Amber	1NO + 1NC	51PE6H9A	51PE6H9ALB	1
		Red	1NO + 1NC	51PE6J2A	51PE6J2ALB	1
		Green	1NO + 1NC	51PE6J3A	51PE6J3ALB	1
		Amber	1NO + 1NC	51PE6J9A	51PE6J9ALB	1
		600V with 6V BA9 type LED	Red	51PE6K2A	51PE6K2ALB	1
		Green	1NO + 1NC	51PE6K3A	51PE6K3ALB	1
		Amber	1NO + 1NC	51PE6K9A	51PE6K9ALB	1

Overload reset operators with reset legend plate

	Version	Color	Legend Inscription	Order No.
 	Single unit 7/8" diameter reset pad, 10" shaft can be cut to length.	Red	Reset	51AAS
	Multi unit For use with multi push operation requirements.	Red	Reset	51AAM

1) For other colors not listed, order operator less lens and separate lens from page 10/127.

2) LED color must match lens color.



3) All illuminated devices come with std. Touch-safe shield per UL stds.

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Selector switch operators

Selection and ordering data

Version	Lever type	Color of insert	Cam Code 1) 2)	Short bushing Order No.	Long bushing Order No.	Pack Unit
	Short lever, non-Illuminated	White	A	51SA2AA	51SA2AALB	1
	Long lever, non-Illuminated	White	A	51SB2AA	51SB2AALB	
	Spring return from right operation	Short lever, non-Illuminated	White	51SA2AC	51SA2ACLB	1
	Long lever, non-Illuminated	White	A	51SB2AC	51SB2ACLB	
Selector switches with 3 switching positions Maintained operation	Short lever, non-Illuminated	White	B	51SA2BA	51SA2BALB	1
	Long lever, non-Illuminated	White	B	51SB2BA	51SB2BALB	
	Short lever, non-Illuminated	White	C	51SA2CA	51SA2CALB	
	Long lever, non-Illuminated	White	C	51SB2CA	51SB2CALB	
	Short lever, non-Illuminated	White	D	51SA2DA	51SA2DALB	
	Long lever, non-Illuminated	White	D	51SB2DA	51SB2DALB	
	Short lever, non-Illuminated	White	E	51SA2EA	51SA2EALB	
	Long lever, non-Illuminated	White	E	51SB2EA	51SB2EALB	
	Short lever, non-Illuminated	White	G	51SA2GA	51SA2GALB	
	Long lever, non-Illuminated	White	G	51SB2GA	51SB2GALB	
Spring return from right operation	Short lever, non-Illuminated	White	B	51SA2BC	51SA2BCLB	1
	Long lever, non-Illuminated	White	B	51SB2BC	51SB2BCLB	
	Short lever, non-Illuminated	White	C	51SA2CC	51SA2CCLB	
	Long lever, non-Illuminated	White	C	51SB2CC	51SB2CCLB	
	Short lever, non-Illuminated	White	D	51SA2DC	51SA2DCLB	
	Long lever, non-Illuminated	White	D	51SB2DC	51SB2DCLB	
	Short lever, non-Illuminated	White	E	51SA2EC	51SA2ECLB	
	Long lever, non-Illuminated	White	E	51SB2EC	51SB2ECLB	
	Short lever, non-Illuminated	White	G	51SA2GC	51SA2GCLB	
	Long lever, non-Illuminated	White	G	51SB2GC	51SB2GCLB	
Spring return from left operation	Short lever, non-Illuminated	White	B	51SA2BB	51SA2BBLB	1
	Long lever, non-Illuminated	White	B	51SB2BB	51SB2BBLB	
	Short lever, non-Illuminated	White	C	51SA2CB	51SA2CBLB	
	Long lever, non-Illuminated	White	C	51SB2CB	51SB2CBLB	
	Short lever, non-Illuminated	White	D	51SA2DB	51SA2DBLB	
	Long lever, non-Illuminated	White	D	51SB2DB	51SB2DBLB	
	Short lever, non-Illuminated	White	E	51SA2EB	51SA2EBLB	
	Long lever, non-Illuminated	White	E	51SB2EB	51SB2EBLB	
	Short lever, non-Illuminated	White	G	51SA2GB	51SA2GBLB	
	Long lever, non-Illuminated	White	G	51SB2GB	51SB2GBLB	
Spring return from left and right operation	Short lever, non-Illuminated	White	B	51SA2BD	51SA2BDLB	1
	Long lever, non-Illuminated	White	B	51SB2BD	51SB2BDLB	
	Short lever, non-Illuminated	White	C	51SA2CD	51SA2CDLB	
	Long lever, non-Illuminated	White	C	51SB2CD	51SB2CDLB	
	Short lever, non-Illuminated	White	D	51SA2DD	51SA2DDLB	
	Long lever, non-Illuminated	White	D	51SB2DD	51SB2DDLB	
	Short lever, non-Illuminated	White	E	51SA2ED	51SA2EDLB	
	Long lever, non-Illuminated	White	E	51SB2ED	51SB2EDLB	
	Short lever, non-Illuminated	White	G	51SA2GD	51SA2GDLB	
	Long lever, non-Illuminated	White	G	51SB2GD	51SB2GDLB	

1) C CAM limited to 4 single or double pole blocks on spring return operators.

2) For contact operation, see CAM selection chart on [page 10/179](#).

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Selector switch operators

Selection and ordering data



Version	Key removal position	Lock number	CAM Code 1) 2)	Short bushing Order No.	Long bushing Order No.	Pack Unit
Key-operated selector switches with 2 switching positions	Both	550CH	A	51SA6AE	51SA6AELB	1
	Left	550CH	A	51SA6AF	51SA6AFLB	
Maintained operation						
Spring return from right operation	Left	550CH	A	51SA6AC	51SA6ACLB	1
Key-operated selector switches with 3 switching positions	All	550CH	B	51SA6BE	51SA6BELB	1
			C	51SA6CE	51SA6CELB	
D			51SA6DE	51SA6DELB		
E			51SA6EE	51SA6EELB		
G			51SA6GE	51SA6GELB		
Maintained operation	Left	550CH	B	51SA6BF	51SA6BFLB	1
			C	51SA6CF	51SA6CFLB	
			D	51SA6DF	51SA6DFLB	
			E	51SA6EF	51SA6EFLB	
			G	51SA6GF	51SA6GFLB	
	Right	550CH	B	51SA6BG	51SA6BGLB	1
			C	51SA6CG	51SA6CGLB	
			D	51SA6DG	51SA6DGLB	
			E	51SA6EG	51SA6EGLB	
			G	51SA6GG	51SA6GGLB	
Center	550CH	B	51SA6BH	51SA6BHLB	1	
		C	51SA6CH	51SA6CHLB		
		D	51SA6DH	51SA6DHLB		
		E	51SA6EH	51SA6EHLB		
		G	51SA6GH	51SA6GHLB		
Left and Center	550CH	B	51SA6BK	51SA6BKLB	1	
		C	51SA6CK	51SA6CKLB		
		D	51SA6DK	51SA6DKLB		
		E	51SA6EK	51SA6EKLb		
		G	51SA6GK	51SA6GKLb		
Spring return from right operation	Center	550CH	B	51SA6BU	51SA6BULB	1
			C	51SA6CU	51SA6CULB	
			D	51SA6DU	51SA6DULB	
			E	51SA6EU	51SA6EULB	
			G	51SA6GU	51SA6GULB	
Spring return from left operation	Center	550CH	B	51SA6BT	51SA6BTLB	1
			C	51SA6CT	51SA6CTLB	
			D	51SA6DT	51SA6DTLB	
			E	51SA6ET	51SA6ETLB	
			G	51SA6GT	51SA6GTLB	
Spring return from left and right operation	Center	550CH	B	51SA6BV	51SA6BVLB	1
			C	51SA6CV	51SA6CVLB	
			D	51SA6DV	51SA6DVLB	
			E	51SA6EV	51SA6EVLB	
			G	51SA6GV	51SA6GVLB	
To order 1 to 25 special locks for keyed selector switches simply replace the 6 in the 5th digit of the catalog number with a 5 when entering your order. (Ordering Example: 52SC6AE is changed to 52SC5AE and all locks - up to				5	5	
To order special locks for keyed selector switches, append corresponding 'X' suffix to part number						
Ordering example:		#549CH	X639			1
51SA6AEX298		#548CH	X640			1
		#547CH	X641			1
		#501CH	X642			1
		#506CH	X643			1

1)C CAM limited to 4 single or double pole blocks on spring return operators.

2)For contact operation, see CAM selection chart on [page 10/179](#).

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Cam selection

1

2

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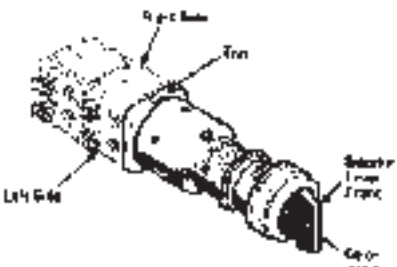
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8

9

10

Selection and ordering data

Design	Ordering Information
	<ul style="list-style-type: none"> Contact blocks are ordered separately, see page 10/182. Determine which table to use based upon the type of selector (non-illuminated & keyed on top, illuminated on bottom). Find the correct number of selector positions (2, 3 or 4 positions). Select the contact operation required for each selector position. X indicates the contacts are closed, while O indicates the contacts are open. (For the selector pushbutton, N=normal and D=depressed). Contact block must be assembled in position shown for each circuit application. Identify the CAM letter required for the chosen contact operation (only 1 CAM can be used per selector switch or selector pushbutton). Contact blocks must be assembled in the position shown for each circuit application. The mounting position is viewed from the front of the device. <p>Ordering CAMs D, E or G</p> <ul style="list-style-type: none"> CAM D, E or G may be ordered at the same price by changing the 6th character of the selector catalog number. Example: Selector with D cam 51SA2DA. <p>Size Requirements</p> <ul style="list-style-type: none"> C CAM on spring return selectors is limited to 4 contact blocks. Standard push buttons accept 4 contact blocks on each side, for a maximum of 8 contact blocks. Selector operators in enclosures are limited to depth of 1 contact block. (2 blocks wide).

Non-illuminated and keyed selector switches (viewed from front)

2 Selector Positions		Contact Blocks		CAM	Mounting	
Left	Right				Left	Right
X	O	52BAJ (NC)	A		L	or R
O	X	52BAK (NO)	A		L	or R
3 Selector Positions		Contact Blocks		CAM	Mounting	
Left	Center	Right			Left	Right
X	O	O	52BAK (NO)	B		R
O	O	X	52BAK (NO)	B	L	
X	X	O	52BAJ (NC)	B	L	
O	X	X	52BAJ (NC)	B	R	
O	O	X	52BAK (NO)	C	L	or R
X	O	O	52BAJ (NC)	C	L	or R
O	O	X	52BAK (NO)	D	L	or R
O	X	O	52BAJ (NC)	D	L	or R
X	O	O	52BAK (NO)	E	L	or R
O	X	O	52BAJ (NC)	E	L	or R
X	O	O	52BAJ (NC)	G	L	
O	X	O	52BAJ (NC)	G		R
O	O	X	52BAK (NO)	G	L	or R

Illuminated selector switches

2 Selector Positions		Contact Blocks		CAM	Mounting	
Left	Right				Left	Right
X	O	52BAJ (NC)	A		L	
O	X	52BAK (NO)	A		L	







1) Wired in parallel.

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Control stations

Selection and ordering data

	Operator Identification ¹⁾	Degree of operator	Contacts/voltage	Number of command points	Order No.	Pack
						Unit
	A = Momentary flush pushbutton black, label "START"	NEMA 7/9	1NO - 1NC	1	51C101H	1
	A = Momentary raised pushbutton red, label "STOP"	NEMA 7/9	1NO - 1NC	1	51C103H	1
	A = Momentary 1 5/8" mushroom head red label "STOP"	NEMA 7/9	1NO - 1NC	1	51C104H	1
	A = Momentary dual pushbutton red label "START, STOP"	NEMA 7/9	1NO - 1NC	1	51C105H	1
	A = 2 position selector switch label "Off-On"	NEMA 7/9	1NO - 1NC	1	51C159H	1
	A = 3 position selector switch label "HAND-OFF-AUTO"	NEMA 7/9	1NO - 1NC	1	51C156H	1
	A = Indicator light, green, 120 V	NEMA 7/9		1	51C131H	1
	A = Indicator light, red, 120 V	NEMA 7/9		1	51C135H	1
	B = Momentary flush pushbutton black, label "START"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C201H	1
	A = Momentary raised pushbutton red, label "STOP"					
	B = Momentary flush pushbutton black, label "FORWARD"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C204H	1
	A = Momentary flush pushbutton red, label "REV"					
	B = Momentary flush pushbutton black, label "START"	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C202H	1
	A = Momentary 1 5/8" mushroom head pushbutton red, label "STOP"					
	B = Indicator light, red, 120 V	NEMA 7/9	1NO - 1NC 1NO - 1NC	2	51C230H	1
	A = Indicator light, green, 120 V					
	C = Momentary flush pushbutton black, label "FORWARD"	NEMA 7/9	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	51C301H	1
	B = Momentary flush pushbutton black, label "REVERSE"					
	A = Momentary raised pushbutton red, label "STOP"					
	C = Momentary flush pushbutton black, label "OPEN"	NEMA 7/9	1NO - 1NC 1NO - 1NC 1NO - 1NC	3	51C303H	1
	B = Momentary flush pushbutton black, label "CLOSE"					
	A = Momentary raised pushbutton red, label "STOP"					
	C = Indicator light, green, 120 V	NEMA 7/9	1NO - 1NC 1NO - 1NC	3	51C307H	1
	B = Momentary flush pushbutton black, label "START"					
	A = Momentary raised pushbutton red, label "STOP"					
	For field assembly of Type 7 & 9 UL listed and cUL listed control stations. Devices may be installed for either horizontal or vertical mounting using a standard legend. Limited to depth of 1 contact block.			1	51EA1H	1
				2	51EA2H	1
				3	51EA3H	1

Enclosures only²⁾

1) All enclosures come standard with one conduit entry on top.
To get two conduit entries, append X-311 to the end of the order number.










2) For legend plates see page 10/218.

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Accessories and spare parts

Selection and ordering data



Version	Suitable for	Conduit size (in.)	Color	Order No.	Pack Unit
	For small 1 5/8" (41.3mm) type, non-illuminated mushroom push-buttons		Black	52RB3D1	1
			Red	52RB3D2	
			Green	52RB3D3	
			Yellow	52RB3D4	
			Blue	52RB3D5	
			Gray	52RB3D6	
			Orange	52RB3D8	
			1 kit of each	52RB3DN	
	For large 2 1/2" (63.5mm) type, non-illuminated mushroom push-buttons		Black	52RB3E1	1
			Red	52RB3E2	
			Green	52RB3E3	
			Yellow	52RB3E4	
			Blue	52RB3E5	
			Gray	52RB3E6	
			Orange	52RB3E8	
			1 kit of each	52RB3EN	
	Replacement lens for pilot lights		Red	51RC4G2	1
			Green	51RC4G3	
			Blue	51RC4G5	
			Amber	51RC4G9	
			Clear	51RC4GA	
	Replacement lens for push to test/illuminated pushbuttons		Red	51RC5G2	1
			Green	51RC5G3	
			Amber	51RC5G9	
	Guards Prevents accidental operation		Chrome	51AAGM	1
	Lever inserts Short lever		Red	52RA2A2	1
			Green	52RA2A3	
			Blue	52RA2A4	
			Amber	52RA2A5	
			Gray	52RA2A6	
			Orange	52RA2A8	
			White	52RA2AB	
	Long lever		Red	52RA2B2	1
			Green	52RA2B3	
			Blue	52RA2B4	
			Amber	52RA2B5	
			Gray	52RA2B6	
			Orange	52RA2B8	
			White	52RA2BB	
	Padlock attachment	Only for raised pushbutton operators		51AAL	1
	Breather/drain (Stainless Steel)	Installs in bottom as a drain or in the top as a breather. Suitable for Class 1 groups C & D and for Class 2 groups F & G applications only. Fits 1/2" NPT.		51AADB	1
	Lock nut wrench	All devices		52MAWB	1
	Spare keys	550CH (1 key)		52KEY-550CH	1

Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Accessories and spare parts

Selection and ordering data

	Version	Suitable for	Conduit size (in.)	Color	Order No.	Pack Unit
	Reducer bushings	Cast aluminum, UL recognized and CSA certified. Used to reduce existing tapered NPT conduit opening when required.	3/4 - 1/2		51AARBA	1
			1 - 1/2		51AARCA	
			1 1/2 - 3/4		51AARDB	
			1 1/2 - 1		51AARDC	
			2 1/2- 3/4		51AARFB	
			2 1/2 - 1		51AARFC	
			2 1/2 - 1 1/2		51AARFD	
			2 1/2 - 2		51AARFE	
			3 - 1		51AARGC	
			3 - 1 1/2		51AARGD	
			3 - 2		51AARGE	
			3 - 2 1/2		51AARGF	
	Lamps with screw connection, miniature bayonet incandescent lamps					
	Flashing, type 267 lamp (replaces 755 lamp)	51, 52	6V		52AABNF	1
	6V Full voltage, transformer type 755 lamp	51, 52	6V		52AABN	1
	12V full voltage, type 756	51, 52	12V		52AACN	1
	24V full voltage, 120/240V resistor push-to-test type 757	51, 52	24V		52AADN	1
	Neon (uses resistors) type B2A (NE-51H)	51, 52	120V		52AAPN	1
	120V, full voltage type 3S6/5	51, 52	120V		52AAENC	1
	LEDs, Single element	51, 52	6V	Red	52AEB2	1
		51, 52	6V	Green	52AEB3	
		51, 52	6V	Yellow	52AEB4	
		51, 52	6V	White	52AEBB	
		51, 52	6V	Blue	52AEB5	
		51, 52	24V	Red	52AED2	
		51, 52	24V	Green	52AED3	
		51, 52	24V	Yellow	52AED4	
		51, 52	24V	White	52AEDB	
		51, 52	24V	Blue	52AED5	
		51, 52	120V	Red	52AEE2	
		51, 52	120V	Green	52AEE3	
		51, 52	120V	Yellow	52AEE4	
		51, 52	120V	White	52AEEB	
51, 52		120V	Blue	52AEE5		




Pushbutton Units and Indicator Lights

Class 51, Hazardous Location NEMA Type 7 & 9 Devices

Accessories and spare parts

1
2
3
4
5
6
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Selection and ordering data

	Version	Suitable for	Conduit size (in.)	Color	Order No.	Pack Unit
 52BAJ  52BAK  52BAR	Touchsafe contact blocks with gold flashing					1
	1 NO				52BAK	
	1 NC				52BAJ ²⁾	
	1 NO - 1 NC				52BJK ²⁾	
	1 NO early make	closes before 52BAK			52BAH	
	1 NC late break	opens after 52BAJ			52BAE	
	1 NO - 1 NC	Reed switch			52BAR ¹⁾	
		UL listed for class 1 division 2				
		.25A Max, 200V AC, 10 Watt max				
		.5A Max, 200V DC, 10 Watt max				
	1 NC extra late break				52BAU	

① Hermetically sealed.

② ➞ Positive opening according to IEC 60947-5-1, Appendix K.

Pushbutton Units and Indicator Lights

30 mm Heavy Duty, Watertight/Oiltight, Class 52

Pushbutton complete units

Features

- Octagonal Mounting Nuts
- Meets Type 1, 3, 3R, 4, 4X, 12, 13 and Automotive Standards
- Heavy Duty Rated NEMA A600/P600 Contacts
- ☞ Positively Driven Contacts
- Positive Indexing Selectors
- Bifurcated Movable Contacts
- Attractive Chrome Plating
- Boots Not Required for Type 4
- UL Listed File # E22655
- CSA Certified File # LR6535
- Touchsafe Terminals

Application

Oil tight pilot controls and accessories are designed to provide long, trouble free service in the most demanding industrial applications. These controls are oil and dust tight and meet Type 3, 4, 4X, 12 and 13 specifications.

Rugged

Industrial control operators are durable one piece castings. Heavy duty plastic buttons resist oils and corrosion. Silver contacts carry heavy duty ratings.

Flexible

Accessories modify standard push buttons, selector switches and pilot lights. Building block construction of contact blocks makes possible many circuitry combinations.

Industrial Appearance

Pilot controls add luster to panels. Chrome plating covers exposed metal parts.

Push Button Operators

The Operator Base consists of a durable, one piece casting equipped with a heavy duty actuator with a stainless steel spring, a neoprene actuator sealing ring to prevent oil and dust from penetrating to the contact blocks, a neoprene gasket to seal operator mounting hole and a chrome plated lock nut.

Mushroom Head Push Button Operators

The Mushroom Head base construction is identical to the push button base. The actuator is molded of high impact material for either a 1 5/8 inch or 2 1/2 inch diameter molded head.

E-STOP Mushroom Head Operators according to EN 60947-5-5 Cat. No. 52BP, 52BR, 52PP, and 52PR, 2 Position, Twist-To-Release & 2 Position, Push Pull Maintained operators provided with red operating heads and 52BJK contact blocks meet the requirements of EN 60947-5-5 for Electrical Emergency Stop Device With Mechanical Latching Function (e-stop).

Contact Blocks

Contact Blocks have double break bifurcated silver contacts, with gold flashing as standard, which improves contact reliability. Contact blocks are heavy duty rated NEMA A600 and suitable for applications down to 5V/1mA solid state outputs. 52BJK offers ☞ Positive Opening Contacts according to IEC 60947-5-1, Appendix K. Molded bodies and pushers resist arcing and tracking. All units have stainless steel springs that resist corrosion and provide strong contact pressure. Captive mounting screws speed panel assembly.

Push Pull Operators

Push Pull Operators combine two or three functions in one unit. The maintained operator has two positions, typically pull to start, push to stop. The momentary operator with three positions provides spring return from both pull and push positions. In addition, a three position push maintained, pull momentary operator is available. The actuator come is 1 3/4 inch or 2 1/2 inch diameter and is available in an illuminated version.

2 Button Maintained Operator

Maintained Push Buttons consist of two push buttons and a latching assembly. When actuated the button remains depressed and is freed only by the release operator to which it is linked. The button assembly adjusts for mounting from a 1 13/16 inch to a 2 5/8 inch center.

Transformer Type Pilot Lights

Transformer Type Pilot Lights are available with a 120, 240, 480 or 600 Volt primary (50/60 Hertz) and a separate secondary winding which supplies reduced voltage to a miniature bayonet base 6 Volt lamp. These units are suitable for applications where vibration is present and long bulb life is desirable.

Full Voltage Type Pilot Lights

Full Voltage Pilot Lights are available for 6, 12, 24 and 120 Volt AC and DC applications.

Electrical Ratings

NEMA AC Ratings 50/60Hz

NEMA A600 10 Continuous Amps

Volts	Make	Break
120	60	6
240	30	3
480	15	1.5
600	12	1.2
VA	7200	720

Ordering Information

- Accessories: [pages 10/207 – 10/210](#)
- Selector Position and Contact Operation: [page 10/205 – 10/206](#).
- Legend Plates: [page 10/218](#).
- Enclosures: [page 10/219](#).
- Technical Specifications: [page 10/220](#).

Resistor Type Pilot Lights

Resistor Type Pilot Lights are available for 240 Volt AC and DC applications. The 240 Volt pilot light is supplied with a 120 Volt lamp and a voltage dropping resistor.

LED Type Pilot Lights

LED's (light emitting diodes) can be used in pilot lights instead of incandescent bulbs because of their long life (up to 10 years), resistance to vibration and ambient sensitivity. Clusted LED options are available for standard pilot lights only. Cluster LED options are not available on Push to test Pilot Lights, Illuminated Pushbuttons, Push-pull, or Twist-to-Release Operators.

Integrated LED Module Type Pilot Lights

The integrated LED module is available for 24, 120, and 240 V. LED modules are vibration resistant and have a long life (up to 10 years). The integrated LED module is available for 24, 120, and 240 V. LED modules are vibration resistant and have a long life (up to 10 yrs.).

Selector Operators

Selector Operators have positive action indexing. Operators are available with either a short or long lever. The molded black lever is designed to accept a color insert. A white insert is provided as standard. Each operator is equipped with a cam to actuate plungers of contact blocks assembled behind the operator. Two, three and four position operators are available with seven different cams.

Lever color inserts are available in 8 colors.



Indicator Light



Push Button



Selector Switch



Selector Push Button

Selection Guid

Momentary Push Button - Non-Illuminated



Flush Head



Extended Head



Large Mushroom Head 2 1/2"



Small Mushroom Head 1 3/4"

Part Number	52	a	M b	c	d	e ¹
-------------	----	---	--------	---	---	----------------

a	Code	Finish
	P	Chrome - Command 52
	B	Epoxy Coated - Black Max

b	Code	Type
	M	Momentary Push Button

c	Code	Style / Head Type
		Flush / Extended Cap ²
	8A	Flush
	8B	Extended
		Mushroom Head Metal
	9A	Small Mushroom Head 1 3/4" (44.5mm)
		Mushroom Head Plastic
	9W	Small Mushroom Head 1 3/4" (44.5mm)
	9V	Large Mushroom Head 2 1/2" (63.5mm)

d	Code	Plastic	Metal
	1	Black	—
	2	Red	Red
	3	Green	Green
	4	Yellow	—
	5	Blue	—
	6	Gray	—
	7	All Color Caps	—
	8	Orange	—
	C	—	Chrome

e ¹	Code	Contact Blocks
	A	1 NO + 1 NC
	B	2 NO + 2 NC
	C	3 NO + 3 NC
	D	4 NO + 4 NC
	E	1 NC (LB)
	F	2 NO
	G	2 NC
	H	1NO (EM)
	J	1 NC
	K	1 NO

¹ For operator without contact blocks leave position e blank.

² Products available fall 2014. For current product offer please refer to the 2010 Industrial Control Catalog.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Push Buttons

Selection Tables

Momentary Push Button - Non-Illuminated

Head Style	Contacts	Color	Finish	
			Chrome	Black Max
Flush	—	Less cap	52PM8	52BM8
		Black	52PM8A1	52BM8A1
		Red	52PM8A2	52BM8A2
		Green	52PM8A3	52BM8A3
		Yellow	52PM8A4	52BM8A4
	1 NO - 1 NC	Black	52PM8A1A	52BM8A1A
		Red	52PM8A2A	52BM8A2A
		Green	52PM8A3A	52BM8A3A
	1 NO	Black	52PM8A1K	52BM8A1K
		Red	52PM8A2K	52BM8A2K
		Green	52PM8A3K	52BM8A3K
	1 NC	Red	52PM8A2J	52BM8A2J
Extended	—	Black	52PM8B1	52BM8B1
		Red	52PM8B2	52BM8B2
		Green	52PM8B3	52BM8B3
	1 NO	Black	52PM8B1K	52BM8B1K
		Red	52PM8B2K	52BM8B2K
	1 NC	Red	52PM8B2J	52BM8B2J
Mushroom Head Plastic Ø 1 3/4"	—	Less cap	52PM9	52BM9
		Red	52PM9W2	52BM9W2
	1 NO	Green	52PM9W3K	52BM9W3K
	1 NO - 1 NC	Black	52PM9W1A	52BM9W1A
		Red	52PM9W2A	52BM9W2A
	1 NO - 1 NC	Green	52PM9W3A	52BM9W3A
		Red	52PM9V2	52BM9V2
Mushroom Head Plastic Ø 2 1/2"	1 NO - 1 NC	Black	52PM9V1A	52BM9V1A
		Red	52PM9V2A	52BM9V2A
		Green	52PM9V3A	52BM9V3A

Readily available items are in **bold**.
This is a small representation of stocked items.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Push Pull

1

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Selection Guide

2 & 3 Position Push-Pull Mushroom Head Devices - Non-Illuminated



Mushroom Head Metal Ø 1 3/4"



Mushroom Head Plastic Ø 2 1/2"



Mushroom Head Plastic Ø 1 3/4"

Part Number	52	<u> </u>	<u>P</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
		a	b	c	d	e	f ³

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Type
	P	Push Pull

c	Code	Function
	2	2 positions - maintained ¹
	3	3 positions - momentary in - momentary out
	7	3 positions - maintained in - momentary out

d	Code	Style
	A	Small metal 1-3/4" (44.5 mm)
	W	Small plastic 1-3/4" (44.5 mm)
	V	Large plastic 2-1/2" (63.5 mm)

e	Code	Color
		Plastic Metal
	1	Black —
	2	Red ¹ Red ¹
	3	Green Green
	4	Yellow —
	5	Blue —
	6	Gray —
	8	Orange —
	C	— Chrome
		No Operating Head
	Z	No head

f ³	Code	Contact Blocks
		2 Position
	A	1 NO + 1 NC ¹
	B	2 NO + 2 NC ¹
	C	3 NO + 3 NC ¹
	D	4 NO + 4 NC ¹
	E	1 NC (LB)
	F	2 NO
	G	2 NC ¹
	H	1 NO (EM)
	J	1 NC ¹
	K	1 NO
	Q	1 NO - 1 NC (ELB)
		3 Position
	U	1 NO - 1 NC extra late break ²

¹ EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks. Positive opening contacts according to IEC 60947-5-1, Appendix K.

² Blocks cannot be interchanged (stop-start circuit - pull to start, push to stop).

³ For operator without contact blocks leave position f blank.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Push Pull

Selection Tables

2 & 3 Position Push-Pull Mushroom Head Devices - Non-Illuminated

		2 pos - maintained					
		Metal Ø 1 3/4"		Plastic Ø 1 3/4"		Plastic Ø 2 1/2"	
Contacts	Color	Chrome	Black Max	Chrome	Black Max	Chrome	Black Max
—	Black	—	—	52PP2W1	52BP2W1	52PP2V1	2BP2V1
	Red	52PP2A2	52BP2A2	52PP2W2	52BP2W2	52PP2V2	52BP2V2
	Green	52PP2A3	52BP2A3	52PP2W3	52BP2W3	52PP2V3	52BP2V3
	Yellow	—	—	52PP2W4	52BP2W4	52PP2V4	52BP2V4
1 NO - 1 NC	Red	52PP2A2A¹	52BP2A2A¹	52PP2W2A¹	52BP2W2A¹	52PP2V2A¹	52BP2V2A ¹
	Green	52PP2A3A	52BP2A3A	52PP2W3A	52BP2W3A	52PP2V3A	—
	Yellow	—	—	52PP2W4A	52BP2W4A	52BP2V4A	52BP2V4A
	Chrome	52PP2ACA	52BP2ACA	—	—	—	—

		3 pos - momentary in - momentary out					
		Metal Ø 1 3/4"		Plastic Ø 1 3/4"		Plastic Ø 2 1/2"	
Contacts	Color	Chrome	Black Max	Chrome	Black Max	Chrome	Black Max
—	Black	—	—	52PP3W1	52BP3W1	52PP3V1	52BP3V1
	Red	52PP3A2	52BP3A2	52PP3W2	52BP3W2	52PP3V2	52BP3V2
	Green	52PP3A3	52BP3A3	52PP3W3	52BP3W3	52PP3V3	2BP3V3
	Chrome	52PP3AC	52BP3AC	—	—	—	—
1 NO - 1 NCELB	Red	52PP3A2U	52BP3A2U	52PP3W2U	52BP3W2U	52PP3V2U	52BP3V2U
	Green	52PP3A3U	52BP3A3U	52PP3W3U	52BP3W3U	52PP3V3U	52BP3V3U

		3 pos - maintained in - momentary out					
		Metal Ø 1 3/4"		Plastic Ø 1 3/4"		Plastic Ø 2 1/2"	
Contacts	Color	Chrome	Black Max	Chrome	Black Max	Chrome	Black Max
—	Black	—	—	52PP7W1	52BP7W1	52PP7V1	52BP7V1
	Red	52PP7A2	52BP7A2	52PP7W2	52BP7W2	52PP7V2	52BP7V2
	Green	52PP7A3	52BP7A3	52PP7W3	52BP7W3	52PP7V3	52BP7V3
	Chrome	52PP7AC	52BP7AC	—	—	—	—
1 NO - 1 NCELB	Red	52PP7A2U1	52BP7A2U	52PP7W2U	52BP7W2U	52PP7V2U	52BP7V2U
	Green	52PP7A3U	52BP7A3U	52PP7W3U	52BP7W3U	52PP7V3U	52BP7V3U

Readily available items are in **bold**.
This is a small representation of stocked items.

¹ EMERGENCY-STOP control devices according to IEC 60947-5-5

Selection Guide

2 & 3 Position Push-Pull Mushroom Head Devices - Illuminated



Mushroom Head Metal Ø 1 3/4"



Mushroom Head Plastic Ø 2 1/2"



Mushroom Head Plastic Ø 1 3/4"

Part Number	52	a	P b	c	d	e	f	g
-------------	----	---	--------	---	---	---	---	---

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Type
	P	Push Pull Operator

c	Code	Function
	2	2 positions - maintained ¹
	3	3 positions - momentary in - momentary out ²
	7	3 positions - maintained in - momentary out ²

d	Code	Operation
		Full Voltage ³ (AC/DC)
		Incandescent LED ⁴
	B	6-8V 6V
	C	12-13V —
	D	24-28V 24-28V
	E	120V 120V
	F	— 240V
		Transformer ³
	G	120V AC
	H	240V AC
	J	480V AC
	K	600V AC

e	Code	Style / Color
		Mushroom Head Metal Ø 1 3/4" (44.5mm)
	2	Red ¹
	3	Green
	5	Blue
	9	Amber
	A	Clear
	B	White
		Mushroom Head Plastic Ø 1 3/4" (44.5 mm)
	R	Red ¹
	S	Green
	T	Amber
		Mushroom Head Plastic Ø 2 1/2" (63.5mm)
	D	Red ¹
	E	Green
	F	Amber
		No Head (full voltage & transformer only)
	Z	No head

f	Code	Contact Blocks
		2 Position
	A	1 NO + 1 NC ¹
	B	2 NO - 2 NC ¹
	F	2 NO
	G	2 NC ¹
	J	1 NC ¹
	K	1 NO
	Q	1 NO - 1 NC (ELB)
		3 Position
	U	1 NO - 1 NC extra late break ²

g	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED ⁵

¹ EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks.

Positive opening contacts according to IEC 60947-5-1, Appendix K,

² Blocks cannot be interchanged (stop-start circuit - pull to start, push to stop).

³ Default bulb type is incandescent. For LED options, append field g. LED option not available on units sold "no head".

⁴ LED voltages apply to table g option code B and Y.

6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

⁵ Not available in 240V.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Pull

Selection Tables

					Operator Type			
					2 pos - maintained			
					Metal Ø 1 3/4"		Plastic Ø 1 3/4"	
Type	Lamp Type	Voltage	Color	Contacts	Chrome	Black Max	Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Red	1 NO - 1 NC	52PP2D2AB¹	52BP2D2AB¹	52PP2DRAB¹	52BP2DRAB¹
			Green	1 NO - 1 NC	52PP2D3AB	52BP2D3AB	52PP2DSAB	52BP2DSAB
	Incandescent	24V	Red	1 NO - 1 NC	52PP2D2A¹	52BP2D2A ¹	52PP2DRA¹	52BP2DRA ¹
			Green	1 NO - 1 NC	52PP2D3A	52BP2D3A	52PP2DSA	52BP2DSA
		120V	Red	1 NO - 1 NC	52PP2E2A ¹	52BP2E2A ¹	52PP2ERA ¹	52BP2ERA ¹
			—	—	52PP2E2	52BP2E2	52PP2ER	52BP2ER
Transformer (AC)	LED	120V	Red	1 NO - 1 NC	52PP2G2AB¹	52BP2G2AB ¹	52PP2GRAB ¹	52BP2GRAB ¹
			Green	1 NO - 1 NC	52PP2G3AB	52BP2G3AB	52PP2GSAB	52BP2GSAB
	Incandescent	120V	Red	1 NO - 1 NC	52PP2G2A¹	52BP2G2A ¹	52PP2GRA¹	52BP2GRA ¹
			Green	1 NO - 1 NC	52PP2G3A	52BP2G3A	52PP2GSA	52BP2GSA
			—	—	—	—	—	—
			—	—	—	—	—	—

					Operator Type			
					3 pos - momentary in - momentary out			
					Metal Ø 1 3/4"		Plastic Ø 1 3/4"	
Type	Lamp Type	Voltage	Color	Contacts	Chrome	Black Max	Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Green	1 NO - 1 NCELB	52PP3D3UB	52BP3D3UB	52PP3DRUB	52BP3DRUB
			Green	1 NO - 1 NCELB	52PP3D3U	52BP3D3U	52PP3DSU	52BP3DSU
	Incandescent	24V	Red	1 NO - 1 NCELB	52PP3D2U	52BP3D2U	52PP3DRU	52BP3DRU
			—	—	52PP3E2	52BP3E2	52PP3ER	52BP3ER
		120V	Red	1 NO - 1 NCELB	52PP3G2UB	52BP3G2UB	52PP3GRUB	52BP3GRUB
			Green	1 NO - 1 NCELB	52PP3G3UB	52BP3G3UB	52PP3GSUB	52BP3GSUB
Transformer (AC)	LED	120V	Red	1 NO - 1 NCELB	52PP3G2U	52BP3G2U	52PP3GRU	52BP3GRU
			Green	1 NO - 1 NCELB	52PP3G3U	52BP3G3U	52PP3GRU	52BP3GRU
	Incandescent	120V	Red	1 NO - 1 NCELB	—	—	—	—
			Green	1 NO - 1 NCELB	—	—	—	—
			—	—	—	—	—	—
			—	—	—	—	—	—

					Operator Type			
					3 pos - maintained in - momentary out			
					Metal Ø 1 3/4"		Plastic Ø 1 3/4"	
Type	Lamp Type	Voltage	Color	Contacts	Chrome	Black Max	Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Green	1 NO - 1 NCELB	52PP7D3UB	52BP7D3UB	52PP7DSUB	52BP7DSUB
			Green	1 NO - 1 NCELB	52PP7D3U	52BP7D3U	52PP7DSU	52BP7DSU
	Incandescent	24V	Red	1 NO - 1 NCELB	52PP7D2U	52BP7D2U	52PP7DRU	52BP7DRU
			—	—	52PP7E2	52BP7E2	52PP7ER	52BP7ER
		120V	Red	1 NO - 1 NCELB	52PP7G2UB	52BP7G2UB	52PP7GRUB	52BP7GRUB
			Green	1 NO - 1 NCELB	52PP7G3UB	52BP7G3UB	52PP7GSUB	52BP7GSUB
Transformer (AC)	LED	120V	Red	1 NO - 1 NCELB	52PP7G2U	52BP7G2U	52PP7GRU	52BP7GRU
			Green	1 NO - 1 NCELB	52PP7G3U	52BP7G3U	52PP7GRU	52BP7GRU
	Incandescent	120V	Red	1 NO - 1 NCELB	—	—	—	—
			Green	1 NO - 1 NCELB	—	—	—	—
			—	—	—	—	—	—
			—	—	—	—	—	—

Readily available items are in **bold**.
This is a small representation of stocked items.

¹ EMERGENCY-STOP control devices according to IEC 60947-5-5

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Twist-to-Release

Selection Guide

2 Position Twist-to-Release Devices Mushroom Head - Non-Illuminated



Plastic 1 3/4" Mushroom Head - Chrome



Plastic 1 3/4" Mushroom Head - Black Max

Part Number	52	<u>a</u>	<u>R</u> b	<u>8</u> c	<u>W</u> d	<u>e</u>	<u>f²</u>
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Finish	Function	Style	Color	Contacts	Part Number
Chrome	2 Position Twist-to-Release	Plastic 1 3/4" Mushroom Head	Red	1 NO - 1 NC	52PR8W2A
Black Max	2 Position Twist-to-Release	Plastic 1 3/4" Mushroom Head	Red	1 NO - 1 NC	52BR8W2A
Chrome	2 Position Twist-to-Release	Plastic 1 3/4" Mushroom Head	Red	None	52PR8W2

Readily available items are in **bold**.

This is a small representation of stocked items.

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Function
	R	2 Position Twist-to-Release, Maintained ¹

c	Code	Style
	8	Plastic 1 3/4" Mushroom Head

d	Code	Lamp Type
	W	Non-Illuminated

e	Code	Color
	2	Red ¹
	3	Green
	4	Yellow
	Z	No head

f ²	Code	Contact Blocks
	A	1 NO + 1 NC ¹
	B	2 NO + 2 NC ¹
	C	3 NO + 3 NC ¹
	D	4 NO + 4 NC ¹
	E	1 NC (LB)
	F	2 NO
	G	2NC ¹
	H	1NO (EM)
	J	1 NC ¹
	K	1 NO

¹ EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks. Positive opening contacts according to IEC 60947-5-1, Appendix K.

² For operator without contact blocks leave position f blank.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

• Revised •
11/15/14

Illuminated Twist-to-Release

Selection Guide

2 Position Twist-to-Release Mushroom Head Devices - Illuminated



Plastic 1 3/4" Mushroom Head - Chrome



Plastic 1 3/4" Mushroom Head - Black Max

Part Number	52	a	R	8	d	e	f	g
			b	c				

Finish	Style	Voltage	Bulb Type	Color	Contacts	Part Number
Chrome	Plastic 1 3/4" Mushroom Head	24V	LED	Red	1 NO - 1 NC	52PR8DRAB
Chrome	Plastic 1 3/4" Mushroom Head	120V	Incandescent	Red	1 NO - 1 NC	52PR8ERA
Chrome	Plastic 1 3/4" Mushroom Head	120V	LED	Red	1 NO - 1 NC	52PR8GRAB

Readily available items are in **bold**.
This is a small representation of stocked items.

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Function
	R	2 Position Twist-to-Release, Maintained

c	Code	Style
	8	Plastic 1 3/4" Mushroom Head

d	Code	Operation
		Full Voltage ² (AC/DC)
		Incandescent LED ³
	B	6-8V 6V
	C	12-13V —
	D	24-28V 24-28V
	E	120V 120V
	F	— 240V
		Transformer ²
	G	120V AC
	H	240V AC
	J	480V AC
	K	600V AC

e	Code	Color
	R	Red ¹
	S	Green
	T	Amber
	Z	No head

f	Code	Contact Blocks
	A	1 NO + 1 NC ¹
	B	2 NO + 2 NC ¹
	C	3 NO + 3 NC ¹
	D	4 NO + 4 NC ¹
	E	1 NC (LB)
	F	2 NO
	G	2NC ¹
	H	1NO (EM)
	J	1 NC ¹
	K	1 NO

g	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED ⁴

1 EMERGENCY-STOP control devices according to IEC 60947-5-5 when provided with red operating head and positively driven NC contact blocks. Positive opening contacts according to IEC 60947-5-1, Appendix K, Molded bodies.

2 Default bulb type is incandescent. For LED options, append field g.
LED option not available on units sold "no head."

3 LED voltages apply to table g option code B and Y.
6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

4 Not available in 240V.

Selection Guide

Indicator Light



Plastic Lens



Glass Lens

Part Number	52	<u> </u> a	<u> </u> L b	<u> </u> c	<u> </u> d	<u> </u> e	<u> </u> f
-------------	----	------------------	-----------------------	------------------	------------------	------------------	------------------

a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Type
	L	Indicator Light

c	Code	Style
	4	Plastic Lens
	5	Glass Lens

d	Code	Operation
		Full Voltage ¹ (AC/DC)
		Incandescent LED ²
	B	6-8V 6V
	C	12-13V —
	D	24-28V 24-28V
	E	120V 120V
	F	— 240V
		Transformer ¹
	G	120V AC
	H	240V AC
	J	480V AC
	K	600V AC

e	Code	Color
	2	Red
	3	Green
	5	Blue
	7	All Colors
	9	Amber
	A	Clear
	B	White
	N	No Lens

f	Code	Bulb Type
	Blank	Incandescent
	XB	LED
	XY	Super-Bright LED ³

¹ Default bulb type is incandescent. For LED options, append field f.
LED option not available on units sold "No Lens".

² LED voltages apply to table f option code XB and XY.
6V, 24V (Super Bright only) and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

³ Not available in 240V.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Indicator Lights

Selection Tables

Indicator Light

Type	Lamp Type	Voltage	Color	Plastic Lens	
				Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Red	52PL4D2XB	52BL4D2XB
			Green	52PL4D3XB	52BL4D3XB
			Blue	52PL4D5XB	52BL4D5XB
			Amber	52PL4D9XB	52BL4D9XB
			White	52PL4DBXB	52BL4DBXB
		120V	Red	52PL4E2XB	52BL4E2XB
			Green	52PL4E3XB	52BL4E3XB
			Amber	52PL4E9XB	52BL4E9XB
			Clear	52PL4EAXB	52BL4EAXB
			White	52PL4EBXB	52BL4EBXB
	Incandescent	24V	Red	52PL4D2	52BL4D2
			Green	52PL4D3	52BL4D3
			Blue	52PL4D5	52BL4D5
			Amber	52PL4D9	52BL4D9
			White	52PL4DB	52BL4DB
			No Lens	52PL4DN	52BL4DN
		120V	Red	52PL4E2	52BL4E2
			Green	52PL4E3	52BL4E3
			Amber	52PL4E9	52BL4E9
			No Lens	52PL4EN	52BL4EN
Transformer (AC)	LED	120V	Red	52PL4G2XB	52BL4G2XB
			Green	52PL4G3XB	52BL4G3XB
			Amber	52PL4G9XB	52BL4G9XB
			White	52PL4GBXB	52BL4GBXB
		480V	Red	52PL4J2XB	52BL4J2XB
			Green	52PL4J3XB	52BL4J3XB
			White	52PL4JBXB	52BL4JBXB
			No Lens	52PL4JN	52BL4JN
	Incandescent	120V	Red	52PL4G2	52BL4G2
			Green	52PL4G3	52BL4G3
			Amber	52PL4G9	52BL4G9
			White	52PL4GB	52BL4GB
			No Lens	52PL4GN	52BL4GN
		240V	Red	52PL4H2	52BL4H2
			Green	52PL4H3	52BL4H3
			No Lens	52PL4HN	52BL4HN
		480V	Red	52PL4J2	52BL4J2
			Green	52PL4J3	52BL4J3
			Amber	52PL4J9	52BL4J9

Readily available items are in **bold**.
This is a small representation of stocked items.

Selection Guide

Push Button & Push-to-Test - Illuminated



Extended Lens



Flush Lens

Part Number	52	<u>a</u>	<u>T</u> <u>b</u>	<u>c</u>	<u>d</u>	<u>e</u>	<u>f</u>	<u>g</u>
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a	Code	Finish
	P	Chrome-Command 52
	B	Epoxy Coated-Black Max

b	Code	Function
	T	Illuminated Push Button / Push-to-Test ¹

c	Code	Style
	6	Extended Lens
	8	Flush Lens ²

d	Code	Operation
		Full Voltage ³ (AC/DC)
		Incandescent LED ⁴
	B	6-8V 6V
	C	12-13V —
	D	24-28V 24-28V
	E	120V 120V
	F	— 240V
		Transformer ³
	G	120V AC
	H	240V AC
	J	480V AC
	K	600V AC

e	Code	Color
	2	Red
	3	Green
	5	Blue
	7	All Colors
	9	Amber
	A	Clear
	B	White
	N	No Lens

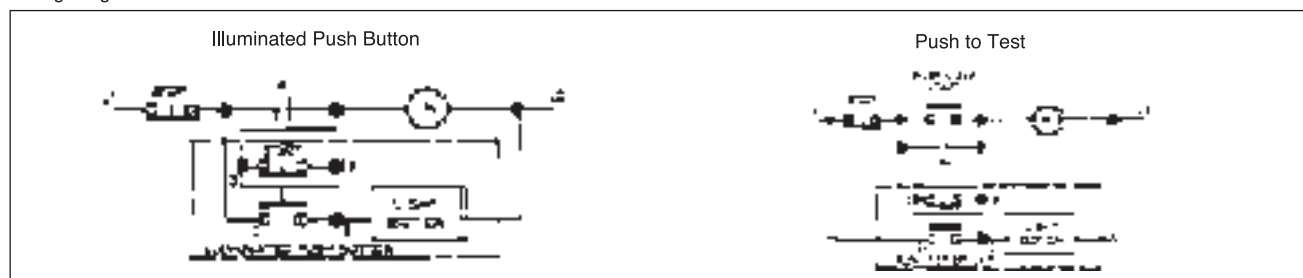
f	Code	Contact Blocks
	A	1 NO - 1 NC
	B	2 NO + 2 NC
	C	3 NO + 3 NC
	D	4 NO + 4 NC
	E	1 NC (LB)
	F	2 NO
	G	2 NC
	H	1NO (EM)
	J	1 NC
	K	1 NO

g	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED ⁵

¹ For push-to-test functionality, wire according to wiring diagram below.

² Products available fall 2014.

Wiring Diagrams



Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Illuminated Push Buttons & Push-to-Test

Selection Tables

Push Button & Push-to-Test - Illuminated

Type	Lamp Type	Voltage	Color	Contacts	Extended Lens	
					Chrome	Black Max
Full Voltage (AC/DC)	LED	24V	Red	1 NO - 1 NC	52PT6D2AB	52BT6D2AB
			Green	1 NO - 1 NC	52PT6D3AB	52BT6D3AB
			Blue	1 NO - 1 NC	52PT6D5AB	52BT6D5AB
			Amber	1 NO - 1 NC	52PT6D9AB	52BT6D9AB
			White	1 NO - 1 NC	52PT6DBAB	52BT6DBAB
	Incandescent	120V	Red	1 NO - 1 NC	52PT6E2AB	52BT6E2AB
			Green	1 NO - 1 NC	52PT6E3AB	52BT6E3AB
			Red	1 NO - 1 NC	52PT6D2A	52BT6D2A
			Green	1 NO - 1 NC	52PT6D3A	52BT6D3A
			Blue	1 NO - 1 NC	52PT6D5A	52BT6D5A
Transformer (AC)	LED	120V	Red	1 NO - 1 NC	52PT6G2AB	52BT6G2AB
			Green	1 NO - 1 NC	52PT6G3AB	52BT6G3AB
			Amber	1 NO - 1 NC	52PT6G9AB	52BT6G9AB
			White	1 NO - 1 NC	52PT6GBAB	52BT6GBAB
			Red	1 NO - 1 NC	52PT6H2AB	52BT6H2AB
	Incandescent	240V	Green	1 NO - 1 NC	52PT6H3AB	52BT6H3AB
			Red	1 NO - 1 NC	52PT6G2A	52BT6G2A
			Green	1 NO - 1 NC	52PT6G3A	52BT6G3A
			Amber	1 NO - 1 NC	52PT6G9A	52BT6G9A
			White	1 NO - 1 NC	52PT6GBA	52BT6GBA
		120V	No Lens	1 NO - 1 NC	52PT6GNA	52BT6GNA
			Green	1 NO - 1 NC	52PT6H3A	52BT6H3A
			Clear	1 NO - 1 NC	52PT6JAA	52BT6JAA

Readily available items are in **bold**.

This is a small representation of stocked items.

Selection Guide

Push Button Mushroom Head Devices – Illuminated⁴



Mushroom Head Metal Ø 1 3/4"



Mushroom Head Plastic Ø 2 1/2"



Mushroom Head Plastic Ø 1 3/4"

Part Number	52	a	T	9	d	e	f	g
-------------	----	---	---	---	---	---	---	---

a	Code	Finish	
	P	Chrome-Command 52	
b	Code	Type	
	T	Push Button Operator	
c	Code	Function	
	9	2 positions – momentary in	
d	Code	Operation	
		Full Voltage ² (AC/DC)	
		Incandescent	LED ³
	B	6-8V	6V
	C	12-13V	—
	D	24-28V	24-28V
	E	120V	120V
	F	—	240V
		Transformer ²	
	G	120V AC	
	H	240V AC	
	J	480V AC	
	K	600V AC	

e	Code	Style / Color
		Mushroom Head Metal Ø 1 3/4" (44.5mm)
	2	Red ¹
	3	Green
	5	Blue
	9	Amber
	A	Clear
	B	White
		Mushroom Head Plastic Ø 1 3/4" (44.5 mm)
	R	Red
	S	Green
	T	Amber
		Mushroom Head Plastic Ø 2 1/2" (63.5mm)
	D	Red ¹
	E	Green
	F	Amber
		No Head (full voltage & transformer only)
	Z	No head

f	Code	Contact Blocks
	A	1 NO + 1 NC
	B	2 NO + 2 NC
	C	3 NO + 3 NC
	D	4 NO + 4 NC
	E	1 NC (LB)
	F	2 NO
	G	2 NC
	H	1NO (EM)
	J	1 NC
	K	1 NO

g	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED ⁵

1 Positive opening according to IEC 60947-5-1, Appendix K.

2 Default bulb type is incandescent. For LED options, append field g. LED option not available on units sold "no head".

3 LED voltages apply to table g option code B and Y.

6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

4 Products available fall 2014.

5 Not available in 240V.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

• Revised •
07/15/16

Illuminated Selector Switches

Selection Guide

Selector Switches – Illuminated



Short Lever – Chrome



Short Lever – Black Max

Part Number	52	S		7						
		a	b	c	d	e	f	g	h	i

Finish	Style	Cam Type	Function	Color	Contacts	Part Number
Chrome	Maintained	2 Position: CAM A	24-28V AC/DC	No Insert	None	52SA7ADN
Chrome	Maintained	2 Position: CAM A	120V AC (Transformer)	No Insert	None	52SA7AGN
Chrome	Maintained	3 Position: CAM C	120V AC	No Insert	None	52SA7CGN

Readily available items are in **bold**.
This is a small representation of stocked items.

a	Code	Type
	S	Selector Switch

b	Code	Finish
	A	Chrome - Command 52
	X	Epoxy Coated - Black Max

c	Code	Style
	7	Maintained

d	Code	Function
	A	2 Position: CAM A
	B	3 Position: CAM B
	C	3 Position: CAM C

e	Code	Operation
		Full Voltage ¹ (AC/DC)
		Incandescent LED ²
	B	6-8V 6V
	C	12-13V —
	D	24-28V 24-28V
	E	120V 120V
	F	— 240V
		Transformer ¹
	G	120V AC
	H	240V AC
	J	480V AC
	K	600V AC

f	Code	Color
	2	Red
	3	Green
	5	Blue
	9	Amber
	A	Clear
	N	No Insert

g	Code	Contact Blocks
	A	1 NO - 1 NC
	E	1 NC (LB)
	H	1 NO (EM)
	J	1 NC
	K	1 NO

h	Code	Contact Quantity & Location
		A CAM & C CAM Left B CAM Right
	0	1 —
	1	— 1
	3	2 —
	4	— 2

i	Code	Bulb Type
	Blank	Incandescent
	B	LED
	Y	Super-Bright LED ³

¹ Default bulb type is incandescent. For LED options, append field i.
LED option not available on units sold "no head".

² LED voltages apply to table i option code B and Y.
6V and 120V are currently AC only. Replaced by AC/DC rated versions end of 2014.

³ Not available in 240V.

For CAM selection see page 10/205.

Selection Guide

Selector Switch – Non-Illuminated



Short Lever



Long Lever

Part Number	52	S		2					
		a	b	c	d	e	f	g ²	h ²

a	Code	Type
	S	Selector Switch

b	Code	Finish
	A	Chrome - Short Lever
	B	Chrome - Long Lever
	X	BlackMax - Short Lever
	W	BlackMax - Long Lever

c	Code	Style
	2	Non-Illuminated

d	Code	Function
	A	2 Position: CAM A
	B	3 Position: CAM B
	C	3 Position: CAM C ¹
	D	3 Position: CAM D
	E	3 Position: CAM E
	G	3 Position: CAM G
	H	4 Position: CAM H

e	Code	Type
		2 Position
		Maintained Spring Return
	A	All —
	C	Left Right
		3 Position
		Maintained Spring Return
	A	All —
	B	Center, Right Left
	C	Center, Left Right
	D	Center Left, Right
		4 Position
		Maintained Position Spring Return
	A	All —

f	Code	Color
	2	Red
	3	Green
	4	Yellow
	5	Blue
	6	Gray
	8	Orange
	B	White
	N	No Insert (Black)

g ²	Code	Contact Blocks
	A	1 NO - 1 NC
	E	1 NC (LB)
	H	1 NO (EM)
	J	1 NC
	K	1 NO

h ²	Code	Contact Quantity & Location
		Left Right
	0	1 —
	1	— 1
	2	1 1
	3	2 —
	4	— 2
	5	2 1
	6	1 2
	7	2 2
	8	3 —
	9	— 3

¹ C CAM on spring return selectors is limited to 4 contact blocks.

For CAM selection see page 10/205.



² For operator without contact blocks leave positions g and h blank.




Push Buttons & Signaling Devices





30mm Water, Oil Tight & Corrosion Resistant – Class 52

Non-Illuminated Selector Switch

Selector Switch, Non-Illuminated¹⁾

Contact Type	Contact	Switch Position		Type	Chrome		Black Max	
		Left	Right	M = Maintained S = Spring Return	Short Lever	Long Lever	Short Lever	Long Lever
					2-Position Operator			
No Contacts	—	—	—	M M	52SA2AAB	52SB2AAB	52SX2AAB	52SW2AAB
				M<---S	52SA2ACB	52SB2ACB	52SX2ACB	52SW2ACB
1 N.O.	A	O	X	M M	52SA2AABK1	52SB2AABK1	52SX2AABK1	52SW2AABK1
				M<---S	52SA2ACBK1	52SB2ACBK1	52SX2ACBK1	52SW2ACBK1
1 N.O.	A	O	X	M M	52SA2AABA1	52SB2AABA1	52SX2AABA1	52SW2AABA1
1 N.C.	B	X	O	M<---S	52SA2ACBA1	52SB2ACBA1	52SX2ACBA1	52SW2ACBA1

Contact Type	Contact	Switch Position			Type	Chrome		Black Max	
		Left	Center	Right	M = Maintained S = Spring Return	Short Lever	Long Lever	Short Lever	Long Lever
						3-Position Operator			
No Contacts	—	—	—	—	M M M	52SA2CAB	52SB2CAB	52SX2CAB	52SW2CAB
					M M M	52SA2BAB	52SB2BAB	52SX2BAB	52SW2BAB
					S--->M M	52SA2BBB	52SB2BBB	52SX2BBB	52SW2BBB
					M M<---S	52SA2BCB	52SB2BCB	52SX2BCB	52SW2BCB
					S--->M<---S	52SA2BDB	52SB2BDB	52SX2BDB	52SW2BDB
1 N.O.	A	O	O	X	M M M	52SA2CABA1	52SB2CABA1	52SX2CABA1	52SW2CABA1
					S--->M M	52SA2CBBA1	52SB2CBBA1	52SX2CBBA1	52SW2CBBA1
1 N.C.	B	X	O	O	M M<---S	52SA2CCBA1	52SB2CCBA1	52SX2CCBA1	52SW2CCBA1
					S--->M<---S	52SA2CDBA1	52SB2CDBA1	52SX2CDBA1	52SW2CDBA1
1 N.O.	A	O	O	X	M M M	52SA2CABA2	52SB2CABA2	52SX2CABA2	52SW2CABA2
1 N.C.	B	X	O	O	S--->M M	52SA2CBBA2	52SB2CBBA2	52SX2CBBA2	52SW2CBBA2
1 N.O.	C	O	O	X	M M<---S	52SA2CCBA2	52SB2CCBA2	52SX2CCBA2	52SW2CCBA2
1 N.C.	D	X	O	O	S--->M<---S	52SA2CDBA2	52SB2CDBA2	52SX2CDBA2	52SW2CDBA2
1 N.O.	A	O	O	X	M M M	52SA2GABJ2K1	52SB2GABJ2K1	52SX2GABJ2K1	52SW2GABJ2K1
1 N.C.	B	X	O	O					
1 N.C.	C	O	X	O					

Contact Type	Contact	Switch Position				Type	Chrome		Black Max	
		Left	Center	Right	Right	M = Maintained S = Spring Return	Short Lever	Long Lever	Short Lever	Long Lever
							4-Position Operator			
No Contacts	—	—	—	—	—	M M M M	52SA2HAB	52SB2HAB	52SX2HAB	52SW2HAB
1 N.O.	A	X	O	O	O	M M M M	52SA2HABJ2K1	52SB2HABJ2K1	52SX2HABJ2K1	52SW2HABJ2K1
1 N.C.	B	O	X	O	O					
1 N.C.	C	O	O	X	O					
1 N.O.	A	O	O	O	X	M M M M	52SA2HABJ2K2	52SB2HABJ2K2	52SX2HABJ2K2	52SW2HABJ2K2
1 N.O.	B	X	O	O	O					
1 N.C.	C	O	X	O	O					
1 N.C.	D	O	O	X	O					

Note: X = Closed / O = Open

1) Readily available items are in **bold**.

This is a small representation of stocked items.

Selection Guide

Keyed Selector Switch

Part Number	52	S a	C b	c	d	e	f ³	g ³	h
-------------	----	--------	--------	---	---	---	----------------	----------------	---

a	Code	Type
	S	Selector Switch

b	Code	Finish
	C	Chrome – Command 52

c	Code	Style
	5	Non-Standard Lock/Key ^{1a}
	6	Standard Lock/Key

d	Code	Function
	A	2 Position: CAM A
	B	3 Position: CAM B
	C	3 Position: CAM C ²
	D	3 Position: CAM D
	E	3 Position: CAM E
	G	3 Position: CAM G
	H	4 Position: CAM H

e	Code	Lock Type
		2 Position
		Maintained / Spring Return
		Key Removal
		Left Right
	E	All Maintained X X
	F	All Maintained X —
	G	All Maintained — X
	X	Spring from Right X —
		3 Position
		Maintained Position Spring Return
		Key Removal
		Left Center Right
		E All — X X X
		F All — X — —
		G All — — — X
		H All — — X —
		J All — X — X
		K All — X X —
		M All — — X X
		T Center, Right Left — X —
		U Left, Center Right — X —
		V Center Left, Right — X —
		W Center, Right Left — — X
		Y Center, Right Left — X X
		Z Left, Center Right X X X
		4 Position
		Maintained Position
		Key Removal
		Left Left Center Right Center Right
		E All X X X X
		F All X — — —
	G	All — — — X

f ³	Code	Contact Blocks
	A	1 NO - 1 NC
	J	1 NC
	K	1 NO
	E	1 NC (LB)
	H	1 NO (EM)

g ³	Code	Contact Quantity & Location
		Left Right
	0	1 —
	1	— 1
	2	1 1
	3	2 —
	4	— 2
	5	2 1
	6	1 2
	7	2 2
	8	3 —
	9	— 3

h	Code	Key Type ^{1b}
	Blank	501CH
	X298	550CH
	X299	549CH
	X300	548CH
	X301	547CH
	X302	506CH



Standard Lock/Key

1a. To Order 1 to 25 special locks for keyed selector switches simply replace the 6 in the 5th digit of the catalog number with a 5 when entering your order.

(Ordering Example: 52SC6AE is changed to 52SC5AE and all locks - up to 25 will be unique).

1b. b. To order the specific lock types shown in table h, simply append the corresponding "X" suffix to a standard part number (Ordering Example: 52SC6AEX298).

Note: Same list price applies as standard keyed locks.

2. C CAM on spring return selectors is limited to 4 contact blocks. For CAM selection see page 10/205.



3 For operator without contact blocks leave positions f and g blank.




Push Buttons & Signaling Devices





30mm Water, Oil Tight & Corrosion Resistant – Class 52

Keyed Selector Switch

Key-operated Selector Switch, Non-Illuminated¹⁾

Contact Type	Contact	Switch Position		Type M = Maintained S = Spring Return	Key Removal	
		Left	Right		Left	Both
					2-Position Operator	
No Contacts	—	—	—	M M	52SC6AF	52SC6AE
				M<---S	52SC6AX	—
1 N.O.	A	O	X	M M	52SC6AFK1	52SC6AEK1
				M<---S	52SC6AXK1	—
1 N.O.	A	O	X	M M	52SC6AFA1	52SC6AEA1
1 N.C.	B	X	O	M<---S	52SC6AXA1	—

Contact Type	Contact	Switch Position			Type M = Maintained S = Spring Return	Key Removal						
		Left	Center	Right		Left	Right	Center	Left & Center	Left & Right	Center & Right	All Positions
						3-Position Operator						
No Contacts	—	—	—	—	M M M	52SC6CF	52SC6CG	52SC6CH	52SC6CK	52SC6CJ	52SC6CM	52SC6CE
					M M M	52SC6BF	52SC6BG	52SC6BH	52SC6BK	52SC6BJ	52SC6BM	52SC6BE
					S--->M M	—	52SC6BW	52SC6BT	—	—	52SC6BY	—
					M M<----S	—	—	52SC6BU	52SC6BZ	—	—	—
					S--->M<---S	—	—	52SC6BV	—	—	—	—
1 N.O.	A	O	O	X	M M M	52SC6CFA1	52SC6CGA1	52SC6CHA1	52SC6CKA1	52SC6CJA1	52SC6CMA1	52SC6CEA1
1 N.C.	B	X	O	O	S--->M M	—	52SC6CWA1	52SC6CTA1	—	—	52SC6CYA1	—
					M M<----S	—	—	52SC6CUA1	52SC6CZA1	—	—	—
					S--->M<---S	—	—	52SC6CVA1	—	—	—	—
1 N.O.	A	O	O	X	M M M	52SC6CFA2	52SC6CGA2	52SC6CHA2	52SC6CKA2	52SC6CJA2	52SC6CMA2	52SC6CEA2
1 N.C.	B	X	O	O	S--->M M	—	52SC6CWA2	52SC6CTA2	—	—	52SC6CYA2	—
1 N.O.	C	O	O	X	M M<----S	—	—	52SC6CUA2	52SC6CZA2	—	—	—
1 N.C.	D	X	O	O	S--->M<---S	—	—	52SC6CVA2	—	—	—	—
1 N.O.	A	O	O	X	M M M	52SC6GFJ2K1	52SC6GGJ2K1	52SC6GHJ2K1	52SC6GKJ2K1	52SC6GJJ2K1	52SC6GMJ2K1	52SC6GEJ2K1
1 N.C.	B	X	O	O								
1 N.C.	C	O	X	O								

Contact Type	Contact	Switch Position				Type M = Maintained S = Spring Return	Key Removal	
		Left	Left Center	Right Center	Right		Right	All Positions
							4-Position Operator	
No Contacts	—	—	—	—	—	M M M M	52SC6HG	52SC6HE
1 N.O.	A	X	O	O	O	M M M M	52SC6HGJ2K1	52SC6HEJ2K1
1 N.C.	B	O	X	O	O			
1 N.C.	C	O	O	X	O			
1 N.O.	A	O	O	O	X	M M M M	52SC6HGJ2K2	52SC6HEJ2K2
1 N.O.	B	X	O	O	O			
1 N.C.	C	O	X	O	O			
1 N.C.	D	O	O	X	O			

Note: X = Closed / O = Open

All Operators listed above are furnished with Lock No. 501CH

1) Readily available items are in bold.

This is a small representation of stocked items.

Push Buttons & Signaling Devices

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Selector Push Button

1
2
3
4
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10

Selection Guide

Selector Push Button

Part Number	52	S a	A b	c	d	e	f ¹
-------------	----	--------	--------	---	---	---	----------------

Finish	Style	Function	Color	Contacts	Part Number
Chrome	Flush Selector Push Button	2 Position CAM Q	Black	None	52SA3Q1
Chrome	Flush Selector Push Button	2 Position CAM R	Black	None	52SA3R1
Chrome	Flush Selector Push Button	2 Position CAM P	Black	None	52SA3P1

Selector Push Buttons

Readily available items are in **bold**.
This is a small representation of stocked items.

a	Code	Type
	S	Selector Push Buttons

b	Code	Finish
	A	Chrome - Command 52

c	Code	Style
	3	Flush Button
	4	Extended Button - 1/2"

d	Code	Function
	P	2 Position: CAM P
	Q	2 Position: CAM Q
	R	2 Position: CAM R
	S	3 Position: CAM S

e	Code	Color
	1	Black
	2	Red

f 1

Code		Contact Blocks							
	CAM P (2 Selector Position)								
	Left		Center		Right		Contact Blocks	Mounting Position	
	N	D	N/A	N/A	N	D			
J0	X	O	—	—	O	O	NC	Left	
K0	O	X	—	—	X	X	NO	Left	
	CAM Q (2 Selector Position)								
	Left		Center		Right		Contact Blocks	Mounting Position	
	N	D	N/A	N/A	N	D			
J0	X	X	—	—	O	O	NC	Left	
J1	X	O	—	—	O	O	NC	Right	
K0	O	O	—	—	O	X	NO	Left	
K1	O	X	—	—	O	X	NO	Right	
	CAM R (2 Selector Position)								
	Left		Center		Right		Contact Blocks	Mounting Position	
	N	D	N/A	N/A	N	D			
J0	X	X	—	—	X	O	NC	Left	
J1	X	O	—	—	X	X	NC	Left	
K0	O	O	—	—	O	X	NO	Right	
K1	O	X	—	—	O	O	NO	Right	
	CAM S (3 Selector Position)								
	Left			Center		Right		Contact Blocks	Mounting Position
	N		D	N	D	N	D		
J0	X		O	O	O	O	NC	Left	
J1	X		O	X	X	O	NC	Right	
K0	O		O	O	X	O	NO	Left	
K1	O		X	O	O	X	NO	Right	

Note: X = Closed / O = Open

¹ For operator without contact blocks leave position f blank

Pushbutton Units and Indicator Lights

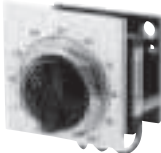



30mm Water, Oil Tight & Corrosion Resistant – Class 52

• Revised •

11/15/14

Special devices

Selection and ordering data

	Version	Ohms / color	Order no.	Pack
				Unit
	Potentiometer operator 2 Watts, 500 V AC/DC (NEMA Type 4)	50	52MA3B01	1
		150	52MA3B03	
		250	52MA3B04	
		500	52MA3B06	
		750	52MA3B07	
		1 K	52MA3B08	
		2.5 K	52MA3B10	
		5 K	52MA3B12	
		10 K	52MA3B14	
		15 K	52MA3B15	
		25 K	52MA3B16	
		50 K	52MA3B18	
		100 K	52MA3B20	
		150 K	52MA3B21	
		250 K	52MA3B22	
		500 K	52MA3B24	
		1 M	52MA3B26	
		1.5 M	52MA3B27	
		2 M	52MA3B28	
		5 M	52MA3B31	
	2 Button maintained operator Button remains depressed when pushed	black (flush) / red (flush)	52MA2A1A2	1
		black (flush) / red (extended)	52MA2A1B2	
		black (flush) / yellow (mushroom)	52MA2A1D4	
		green (flush) / red (flush)	52MA2A3A2	
		green (flush) / red (extended)	52MA2A3B2	
		green (flush) / red (mushroom)	52MA2A3D2	
		green (flush) / green (mushroom)	52MA2A3D3	
		less caps	52MA2	
	Wobble stick 2.5" operator For use with 52BAJ (NC) contact block	red	52ABW2^①	1
		green	52ABW3^①	
		grey	52ABW6^①	
	Maintained toggle operator		52ABT	1

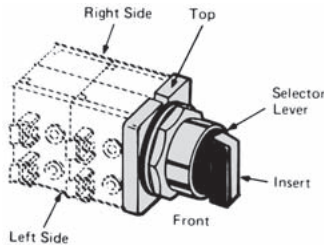
① For use with 52BAJ (NC) contact block

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Cam selection

Selection and ordering data



Ordering Information

- Contact blocks are ordered separately, [see page 10/205](#)
- Determine which table to use based upon the type of selector (non-illum selector switch-top, illum selector switch-middle, and selector pushbutton-bottom).
- Find the correct number of selector positions (2, 3 or 4 positions).
- Select the contact operation required for each selector position. X indicates the contacts are closed, while O indicates the contacts are open. (For the selector pushbutton, N=normal and D=depressed).
- Contact block must be assembled in position shown for each circuit application.
- Identify the CAM letter required for the chosen contact operation (only 1 CAM can be used per selector switch or selector pushbutton).
- Contact blocks must be assembled in the position shown for each circuit application. The mounting position is viewed from the front of the device.

Ordering CAMs D, E or G

- CAM D, E or G may be ordered at the same price by changing the 6th character of the selector catalog number. Example: Selector with D cam **52SX2DAB**.

Size Requirements

- C CAM on spring return selectors is limited to 4 contact blocks.
- Selector operators in enclosures are limited to depth of 1 contact block. (2 blocks wide).

Non-illuminated and keyed selector switches (viewed from front)

2 Selector Positions		Contact Blocks		CAM		Mounting	
Left	Right					Left	Right
X	O	NC (52BAJ)		A		L	or R
O	X	NO (52BAK)		A		L	or R

3 Selector Positions			Contact Blocks		CAM		Mounting	
Left	Center	Right					Left	Right
X	O	O	NO (52BAK)		B			R
O	O	X	NO (52BAK)		B		L	
X	X	O	NC (52BAJ)		B		L	
O	X	X	NC (52BAJ)		B			R
X	O	X	2NO (2-52BAK)		B		L	and R
X	O	O	NC (52BAJ)		C		L	or R
O	O	X	NO (52BAK)		C		L	or R
O	X	O	NC (52BAJ)		D		L	or R
O	O	X	NO (52BAK)		D		L	or R
X	O	O	NO (52BAK)		E		L	or R
O	X	O	NC (52BAJ)		E		L	or R
X	O	O	NC (52BAJ)		G		L	
O	X	O	NC (52BAJ)		G			R
O	O	X	NO (52BAK)		G		L	or R

4 Selector Positions				Contact Blocks		CAM		Mounting	
Left	Left Center	Right Center	Right					Left	Right
X	O	O	O	NO (52BAK)		H			R
O	X	O	O	NC (52BAJ)		H		L	
O	O	X	O	NC (52BAJ)		H			R
O	O	O	X	NO (52BAK)		H		L	

Illuminated selector switches (viewed from front)

2 Selector Positions		Contact Blocks		CAM		Mounting	
Left	Right					Left	Right
X	O	NC (52BAJ)		A		L	
O	X	NO (52BAK)		A		L	

3 Selector Positions			Contact Blocks		CAM		Mounting	
Left	Center	Right					Left	Right
O	O	X	NC (52BAJ)		B			R
O	X	O	NO (52BAK)		B			R
X	O	O	NC (52BAJ)		C		L	
O	O	X	NO (52BAK)		C		L	

Selector Pushbuttons (viewed from front)

2 Selector Positions		Contact Blocks		CAM		Mounting	
Left	Right					Left	Right
N	D	N	D				
X	O	O	O	NC (52BAJ)	Q		R
X	X	O	O	NC (52BAJ)	Q	L	
O	X	O	X	NO (52BAK)	Q		R
O	O	O	X	NO (52BAK)	Q	L	
X	O	O	O	NC (52BAJ)	P	L	or R
O	X	X	X	NO (52BAK)	P	L	or R
X	X	X	O	NC (52BAJ)	R	L	
X	O	X	X	NC (52BAJ)	R		R
O	X	O	O	NO (52BAK)	R		R
O	O	O	X	NO (52BAK)	R	L	

3 Selector Positions			Contact Blocks		CAM		Mounting	
Left	Center	Right					Left	Right
N	D	N	D	N	D			
X	O	O	O	O	O	NC (52BAJ)	S	
X	O	X	O	O	O	NC (52BAJ)	S	
O	X	O	O	O	X	NO (52BAK)	S	R
O	O	O	X	O	X	NO (52BAK)	S	

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Custom selector switch designs

Selection and ordering data

Assembled Non-illuminated Selector Switches

- Determine contact block and location from above.
- Select block suffix. Ex: **J = 52BAJ**.
- Now select position suffix.
- **1-52BAJ** block mounted on right side, suffix will be **J 1**.
- Additional suffixes allow for multiple quantities and locations.
- Repeat process for next block if required.
- Add list price of blocks to operator list price.
- Consult factory for delivery.

Example 1:	Block Suffix	Position Suffix	
		Suffix	Quantity and Location
X O O O O X HAND-OFF-AUTO Maintained Switch Catalog No 52SA2CAB A 1 = 52A2CABA1 (52BJK block mounted on right side)	A = 1 NO - 1 NC, 52BJK E = NC Late Break, 52BAE H = NO Early Make, 52BAH J = NC, 52BAJ K = NO, 52BAK		
Example 2: X O O 52BAJ (L) O X O 52BAJ (R) O O X 52BAK (L or R) }K1 G Cam required Catalog No 52SA2GAB J2 K1 = 52SA2GABJ2K1			
		0	1 —
		1	— 1
		2	1 1
		3	2 —
		4	— 2
		5	2 1
		6	1 2
		7	2 2
		8	3 —
		9	— 3

Selection and ordering data

	Version	Suitable for	Color	Order no.
	Flush actuator lens cap	For flush type, non-illuminated pushbuttons bag of 20 caps	black red green yellow blue gray orange kit- all colors	52RA1A1 52RA1A2 52RA1A3 52RA1A4 52RA1A5 52RA1A6 52RA1A8 52RA1AN
	Extended actuator lens cap	For extended type, non-illuminated pushbuttons bag of 20 caps	black red green yellow blue gray orange 1 of each color cap	52RA1B1 52RA1B2 52RA1B3 52RA1B4 52RA1B5 52RA1B6 52RA1B8 52RA1BN
	Mushroom head cap - Plastic set-screw type replacement caps are for discontinued 52PB9 and 52PX9 operators only	For large 2 1/2" (63.5mm) type, set screw non-illuminated mushroom pushbuttons For small 1 5/8" (41.3mm) type, non-illuminated mushroom pushbuttons	black red green yellow blue gray orange 1 kit of each color cap black red green yellow blue gray orange 1 of each color cap	52RB3E1 52RB3E2 52RB3E3 52RB3E4 52RB3E5 52RB3E6 52RB3E8 52RB3EN 52RB3D1 52RB3D2 52RB3D3 52RB3D4 52RB3D5 52RB3D6 52RB3D8 52RB3DN
	Mushroom head cap - Metal set-screw type	For small 1 5/8" (41.3mm) type, set screw non-illuminated mushroom pushbuttons	chrome red green	52RB3FC 52RB3F2 52RB3F3
	Replacement Lens for Indicator Lights	For catalog numbers starting with 52PL or 52BL ^{①②} Plastic Glass	red green blue amber clear white 1 of each color red green blue amber clear white 1 of each color	52RA4S2 52RA4S3 52RA4S5 52RA4S9 52RA4SA 52RA4SB 52RA4SN 52RA4T2 52RA4T3 52RA4T5 52RA4T9 52RA4TA 52RA4TB 52RA4TN
	Replacement Lens for Push to Test/Illuminated Pushbuttons	For catalog numbers starting with 52PT or 52BT ^③ Plastic	red green blue amber clear white	52RA5S2 52RA5S3 52RA5S5 52RA5S9 52RA5SA 52RA5SB

① To order replacement lens for indicator lights starting with 52PA, 52PE, or 52PX, change the 6th digit to P for plastic and G for glass.

② It is possible to retrofit catalog numbers starting with 52PA, 52PE and 52PX with the replacement lens. The new lens have concentric ribs for improved light distribution.

③ To order replacement lens for push to test / illuminated pushbuttons starting with 52PA, 52PE, or 52PX, change the 6th digit to a P.







Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

• Revised •
07/15/16

Accessories and spare parts

Selection and ordering data

	Version	Suitable for	Color	Order no.
	Mushroom head push pull illuminated plastic screw-on type	For small 1 3/4" type, push-pull units	red green amber	52RC3JR 52RC3JS 52RC3JT
		For large 2 1/2" type, push-pull units	red green amber	52RC3KR 52RC3KS 52RC3KT
	Mushroom head push pull illuminated metal screw-on type	Chrome, for small 1 3/4" type, push-pull units	red green amber white	52RB3H2 52RB3H3 52RB3H9 52RB3HB
		BlackMax, for small 1 3/4" type, push-pull units	red green amber white	52RX3H2 52RX3H3 52RX3H9 52RX3HB
	Mushroom head push pull non-illuminated plastic screw-on type	For small 1 3/4" type, push-pull units (catalog numbers starting with 52PP, 52BP, 52PM9 or 52BM9)①	black red green yellow blue gray orange 1 of each color	52RC3D1 52RC3D2 52RC3D3 52RC3D4 52RC3D5 52RC3D6 52RC3D8 52RC3DN
		For large 2 1/2" type, push-pull units (catalog numbers starting with 52PP, 52BP, 52PM9 or 52BM9)①	black red green yellow blue gray orange 1 of each color	52RC3E1 52RC3E2 52RC3E3 52RC3E4 52RC3E5 52RC3E6 52RC3E8 52RC3EN
	Mushroom head push pull non-illuminated metal screw-on type	For small 1 3/4" type, push-pull units (catalog numbers starting with 52PP or 52BP)①	red green chrome	52RC3F2 52RC3F3 52RC3FC
	Twist to release head illuminated plastic screw-on type	For small twist to release units	red green amber	52RC3RR 52RC3RS 52RC3RT
	Twist to release head non-illuminated plastic screw-on type	For small twist to release units	red green yellow	52RC3R2 52RC3R3 52RC3R4
	Replacement lens kit for illuminated selector switches (Knob with Insert)		red green blue amber clear white	52RA6P2 52RA6P3 52RA6P5 52RA6P9 52RA6PA 52RA6PB
	Lever inserts Short lever		red green yellow blue gray orange white	52RA2A2 52RA2A3 52RA2A4 52RA2A5 52RA2A6 52RA2A8 52RA2AB
	Long lever		red green yellow blue gray orange white	52RA2B2 52RA2B3 52RA2B4 52RA2B5 52RA2B6 52RA2B8 52RA2BB









① For push-pull units whose catalog numbers that start with 52PX, 52PA or 52PE, replacement heads are available. Order from the 52RB type "Mushroom head pushbutton cap" section on page 10/205.

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Accessories and spare parts

Selection and ordering data

Version	Suitable for	Color	Order no.
 Protective boot Offers protection from ice and foreign substances from interfering with button operation	Flush pushbutton operations	clear black	52AABA 52AAB1
 Guards Prevents accidental operation	Non-illuminated basic pushbuttons 1 5/8" mushroom pushbuttons, 1 3/4" push-pull units ^① , and twist to release units Push to test/illuminated pushbutton and indicator lights	chrome blackmax chrome blackmax chrome blackmax	52AAGP 52AXGP 52AAGM 52AXGM 52AAGL 52AXGL
 EMERGENCY-STOP Lock Out EMERGENCY-STOP Backing Ring	Class 52 Illuminated Mushroom Head Pushbuttons; 304 Stainless Steel Yellow 90mm E-STOP Backing Ring	chrome (304 SS)	52AALE 52AAR
 Locknuts Replacement front ring	Non-illuminated basic pushbuttons Non-illuminated mushroom pushbuttons Push-pull and twist-to-release units (only for push-pull units starting with 52PP or 52BP) ^② Indicator Lights Selector switches	chrome blackmax chrome blackmax chrome blackmax blue amber chrome blackmax	52AANP 52AXNP 52AANL 52AXNL 52CANP 52CXNP 52AANL 52AXNL 52AANS 52AXNS
Mounting Accessories	Class 52 Trim Washer Kit (Set of 10 pcs) Class 52 Washer Kit (Include 2-Neoprene Gaskets, 1-Trim Washer, 1-Index Locking Ring (chrome))	chrome	52AAQ 52AAD
Padlock attachments	Non-illuminated basic pushbuttons	flush extended	52AALA 52AALB
 Padlock cover Lock devices in off position	Pushbuttons, selector switches, and non-illuminated mushroom heads		52AALS
 Lock nut wrench	All devices		52MAWB
 Hole plugs		corrosion resistant steel, grey stainless steel	52AAH6 52ABH6 52ABHS
Spare keys (Kit includes 1 Key)	Class 52 Standard Keyed Selector Switch. Keyed Selector Switch ordered with Suffix X302. Keyed Selector Switch ordered with Suffix X301. Keyed Selector Switch ordered with Suffix X300. Keyed Selector Switch ordered with Suffix X299. Keyed Selector Switch ordered with Suffix X298.	501CH 506CH 547CH 548CH 549CH 550CH	52KEY-501CH 52KEY-506CH 52KEY-547CH 52KEY-548CH 52KEY-549CH 52KEY-550CH
Grounding kit	All devices		52AL109145
 Touchsafe contact blocks with gold flashing 52 BAJ 1 NO 1 NC 1 NO - 1 NC 52 BAK 1 NO early make 1 NC late break 1 NO - 1 NC 52 BAR 1 NC extra late break	 closes before 52BAK opens after 52 BAJ Reed switch; UL listed for class 1 division 2; .25A Max, 200V AC, 10 Watt max .5A Max, 200V DC, 10 Watt max		52BAK 52BAJ ^④ 52BJK ^④ 52BAH 52BAE 52BAR ^④ 52BAU

① These can also be used with the 1 5/8" push-pull devices.

② For push-pull units starting with part numbers 52PA, 52PE or 52PX, replacement locknuts can be ordered using 52AANL (Chrome) and 52AXNL (BlackMax).

③ Hermetically Sealed

④ ⊕ Positive opening according to IEC 60947-5-1, Appendix K.


Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

• Revised •
08/15/14

Accessories and spare parts

Selection and ordering data

Version	Suitable for	Lamp voltage	Color	Order no.
Lamps with screw connection, miniature bayonet (BA 9s style)				
	Incandescent lamps,			
	Flashing, type 267 lamp (replaces 755 lamp)	51, 52	6 V	52AABNF
	6V type 755 lamp (Rated 150 mA)	51, 52	6 V	52AABN
	12V type 756 (Rated 80 mA)	51, 52	12 V	52AACN
	24V type 757 (Rated 80 mA)	51, 52	24 V	52AADN
	48V, 2W	52	48 V	3SB1902-1AP
	60V, 2W	52	60 V	3SR9424
	120V, 2.5W, type #120MB (Rated 250 mA)	52	120 V	52AAENC1
Neon (uses resistors) type B2A (NE-51H)			52	120 V
Candelabra, 120V, 3W, Full voltage type 3S6/5			52 older revision styles	120 V
				52AAENC
LED bulbs^①				
LED, BA9s type ^②		Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC	52AEB□ 52AED□ 52AEE□
Super-Bright LED ^②		Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC 120 V DC	52AEB□7 52AED□7 52AEE□7 52AEV□7
LED lighting module with integrated LED.				
Single LED (Rated 35 mA Maximum)		Class 52	24 V AC/DC 120 V AC 240 V AC	52AAIL□ 52AAIM□ 52AAIN□
Full voltage lighting module accessory with BA9s type lamp^①				
LED ^②		Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC	52Aafb□B 52Aafd□B 52Aafe□B
Super-Bright LED ^②		Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC	52Aafb□Y 52Aafd□Y 52Aafe□Y
Incandescent bulb		Class 52	6 V AC/DC 24 V AC/DC 120 V AC/DC	52Aafb 52Aafd 52Aafe
Transformer lighting module accessory with BA9s type lamp^①				
LED		Class 52	120 V AC 240 V AC 480 V AC 600 V AC	52AATG□B 52AATH□B 52AATJ□B 52AATK□B
Super-Bright LED		Class 52	120 V AC 240 V AC 480 V AC 600 V AC	52AATG□Y 52AATH□Y 52AATJ□Y 52AATK□Y
Incandescent bulb		Class 52	120 V AC 240 V AC 480 V AC 600 V AC	52AATGN 52AATHN 52AATJN 52AATKN

Color options:

red
green
yellow/amber
blue
white/clear

2
3
4
5
B

① Standard LED lamps are recommended for indoor applications, Super-Bright LED Lamps are recommended for outdoor applications.

② 6V, 24V (Super Bright only) and 120V are currently AC only.
Replaced by AC/DC rated versions end of 2014.

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

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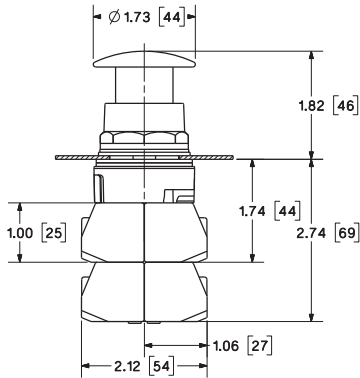
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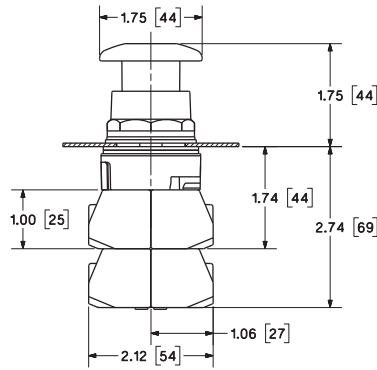
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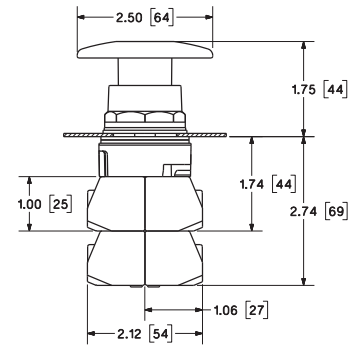
Non-Illuminated Push-Pull
Metal Mushroom Head



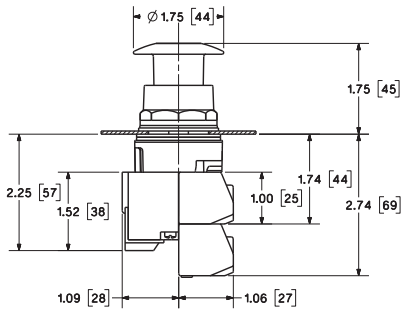
Non-Illuminated Push-Pull
Small Plastic Mushroom Head



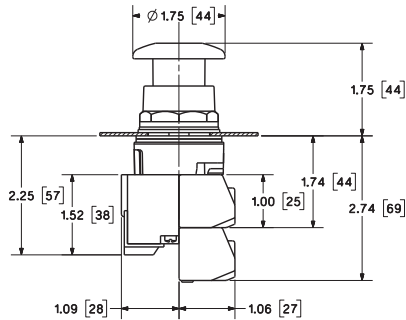
Non-Illuminated Push-Pull
Large Plastic Mushroom Head



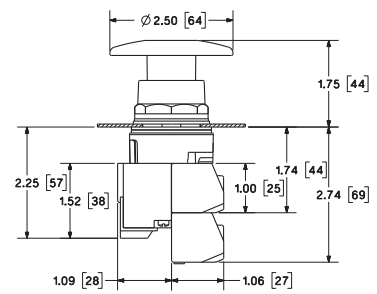
Illuminated Push-Pull
Metal Mushroom Head



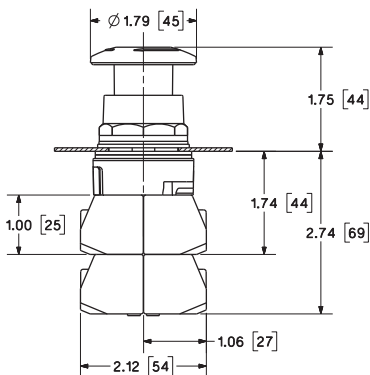
Fully Illuminated Push-Pull
Small Plastic Mushroom Head



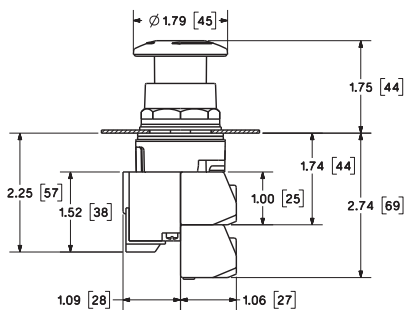
Illuminated Push-Pull
Large Plastic Mushroom Head



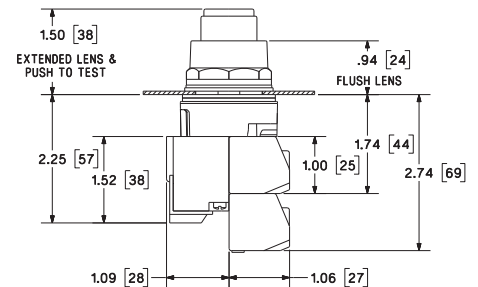
Non-Illuminated Twist Release
Plastic Mushroom Head



Illuminated Twist Release
Plastic Mushroom Head



Illuminated Pushbutton Flush Lens
Illuminated Pushbutton Extended Lens
Illuminated Push to Test

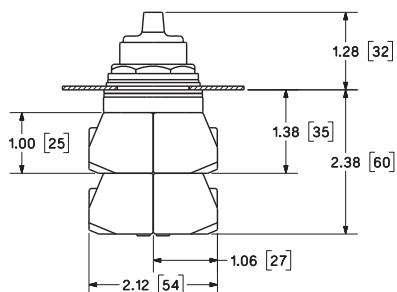


Pushbutton Units and Indicator Lights

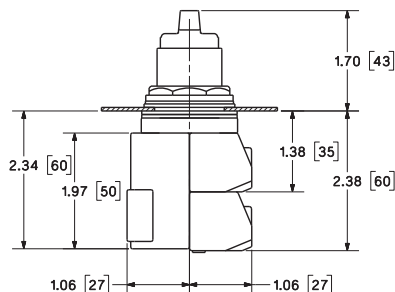
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

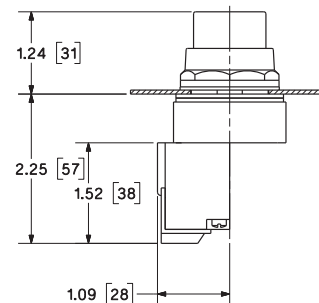
Selector Switch
Non-Illuminated



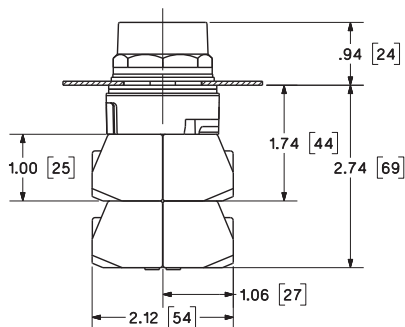
Selector Switch
Illuminated



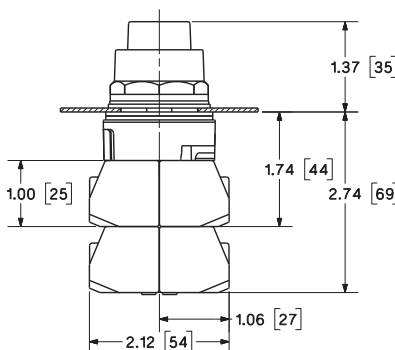
Indicator Light
Plastic Lens



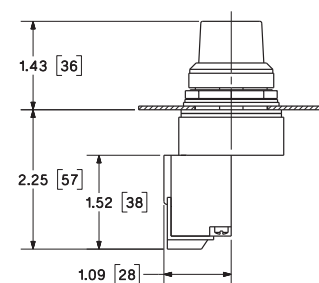
Momentary Pushbutton
Non-Illuminated Flush Cap



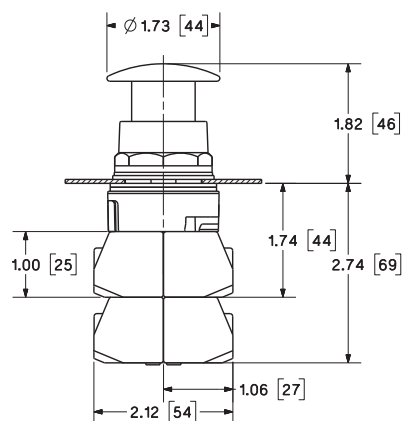
Momentary Pushbutton
Non-Illuminated Raised Cap



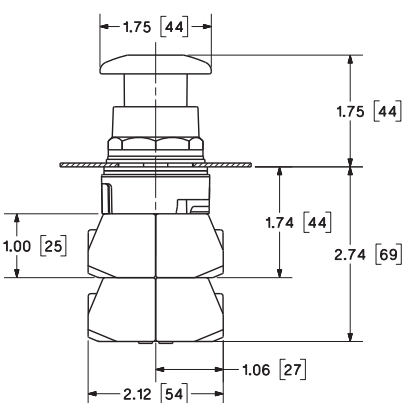
Indicator Light
Glass Lens



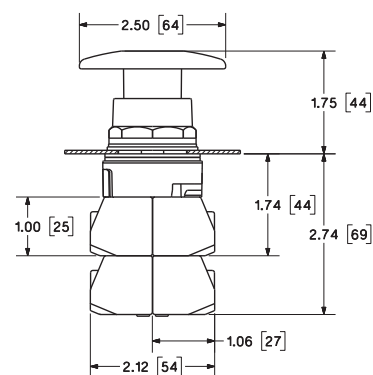
Momentary Pushbutton
Metal Mushroom Head



Momentary Pushbutton
Small Plastic Mushroom Head



Momentary Pushbutton
Large Plastic Mushroom Head



Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

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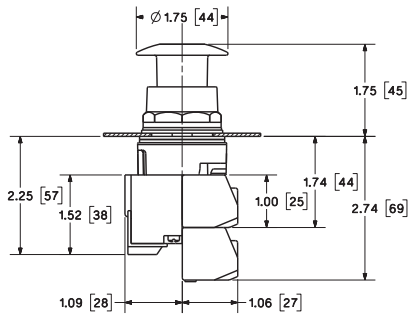
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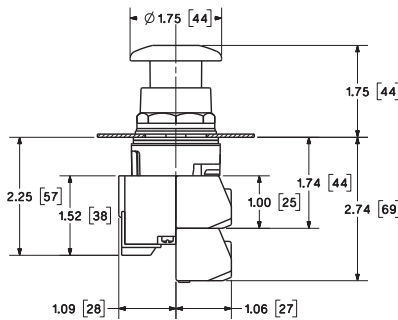
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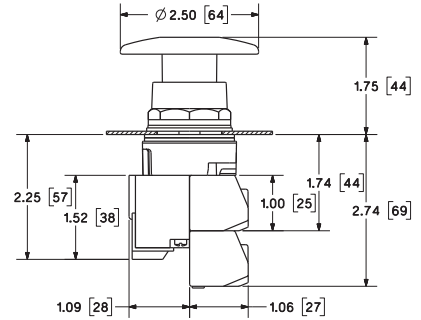
Illuminated Momentary Pushbutton
Metal Mushroom Head



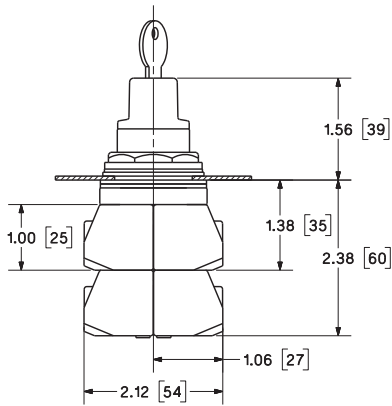
Illuminated Momentary Pushbutton
Small Plastic Mushroom Head



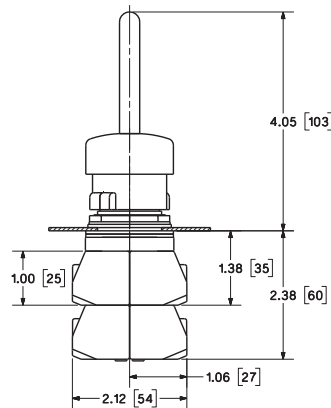
Illuminated Momentary Pushbutton
Large Plastic Mushroom Head



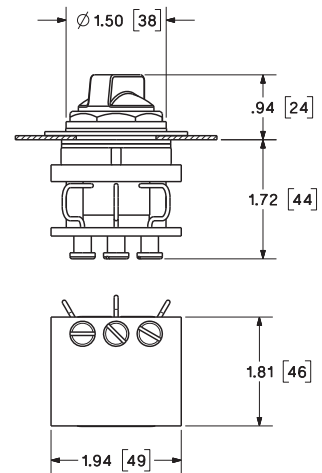
Selector Switch
Keyed



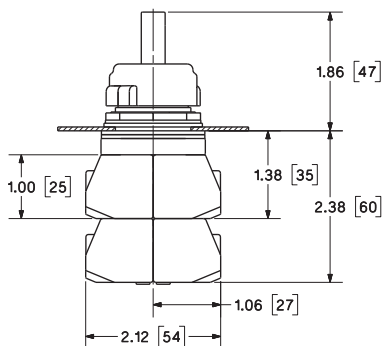
Wobble Switch



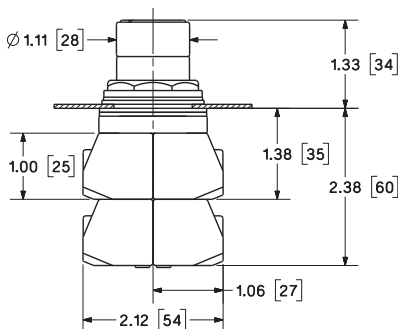
Potentiometer Switch



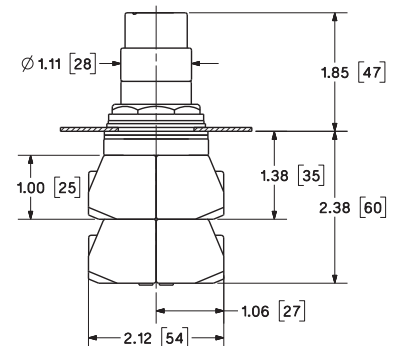
Toggle Switch



Selector Pushbutton Switch
Flush Cap



Selector Pushbutton Switch
Raised Cap

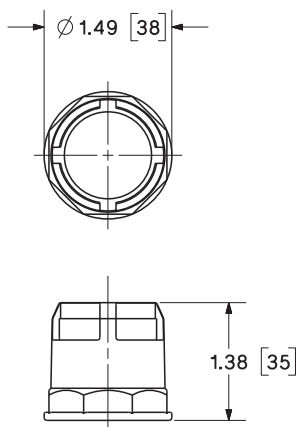


Pushbutton Units and Indicator Lights

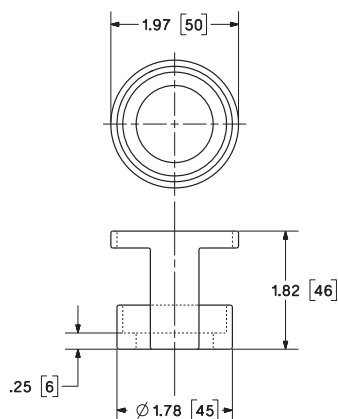
30mm Water, Oil Tight & Corrosion Resistant – Class 52

Dimensional drawings

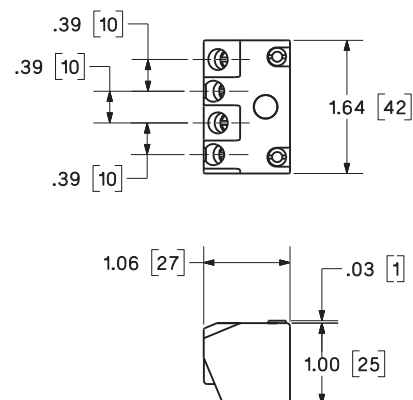
Momentary Pushbutton Guard
Illuminated Push to Test Guard



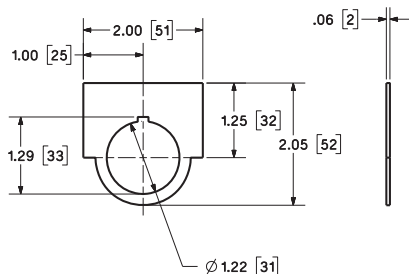
Mushroom Head Guard



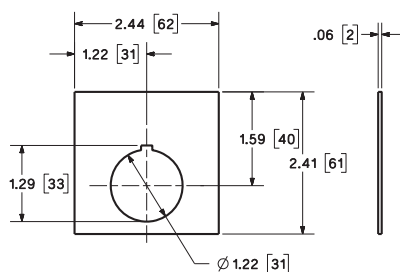
Contact Block



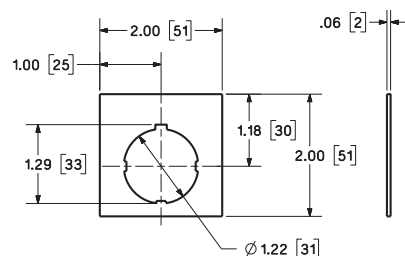
Large Metal Legend Plate



Automotive Metal Legend Plate



Large Plastic Legend Plate





Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant - Class 52

Class 52 oiltight pushbutton stations

Selection and ordering data

	Actuator identification C = top device in station B = middle device in station A = bottom device in station	Degree of protection ^①	Contact / voltage	No. of command points	Order no.	Pack
						Unit
1 unit control station 	A = Momentary flush pushbutton black, label "START"	NEMA 12	1NO - 1NC	1	52C101A	
	A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO - 1NC	1	52C103A	
	A = Momentary mushroom head red, label "STOP"	NEMA 12	1NO - 1NC	1	52C104A	
	A = Maintained metal mushroom head red, label "EMERGENCY STOP"	NEMA 12	1NO - 1NC	1	52C117A	
	A = 2 position selector switch "OFF-ON"	NEMA 12	1NO - 1NC	1	52C159A	
	A = 3 position selector switch "HAND-OFF-AUTO"	NEMA 12	1NO - 1NC	1	52C156A	
	A = Indicator light, red	NEMA 12	120V Transformer type	1	52C131A	
	A = Indicator light, green	NEMA 12	120V Transformer type	1	52C135A	
	A = Momentary flush pushbutton black, label "START"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C101S	
	A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C103S	
	A = Momentary mushroom head red, label "STOP"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C104S	
	A = Maintained metal mushroom head red, label "EMERGENCY STOP"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C116S	
	A = 2 position selector switch "OFF-ON"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C159S	
	A = 3 position selector switch "HAND-OFF-AUTO"	NEMA 4X Stainless Steel	1NO - 1NC	1	52C156S	
	A = Momentary flush pushbutton black, label "START"	NEMA 4X Fiberglass	1NO - 1NC	1	52C101X	
	A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO - 1NC	1	52C103X	
	A = Momentary mushroom head red, label "STOP"	NEMA 4X Fiberglass	1NO - 1NC	1	52C104X	
	A = Maintained metal mushroom head red, label "EMERGENCY STOP"	NEMA 4X Fiberglass	1NO - 1NC	1	52C116X	
	A = 2 position selector switch "OFF-ON"	NEMA 4X Fiberglass	1NO - 1NC	1	52C159X	
	A = 3 position selector switch "HAND-OFF-AUTO"	NEMA 4X Fiberglass	1NO - 1NC	1	52C156X	
2 unit control station 	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC	2	52C201A	
	B = Momentary flush pushbutton black, label "START" A = Momentary Mushroom head pushbutton red, label "STOP"	NEMA 12	1NO, 1NC 1NO, 1NC	2	52C202A	
	B = Momentary flush pushbutton, label "FORWARD" A = Momentary flush pushbutton, label "REVERSE"	NEMA 12	1NO, 1NC 1NO, 1NC	2	52C204A	
	B = Momentary flush pushbutton, label "UP" A = Momentary flush pushbutton, label "DOWN"	NEMA 12	1NO, 1NC 1NO, 1NC	2	52C223A	
	B = Indicator light, red, label "RUN" A = Maintained selector switch, label "HAND-OFF-AUTO"	NEMA 12	120V Transformer type	2	52C224A	
	B = Indicator light, red A = Indicator light, green	NEMA 12	120V Transformer type	2	52C230A	
	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC	2	52C201S	
	B = Momentary flush pushbutton black, label "START" A = Momentary Mushroom head pushbutton red, label "STOP"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC	2	52C202S	
	B = Momentary flush pushbutton, label "UP" A = Momentary flush pushbutton, label "DOWN"	NEMA 4X Stainless Steel	1NO, 1NC 1NO, 1NC	2	52C223S	
	B = Indicator light, red, label "RUN" A = Maintained selector switch, label "HAND-OFF-AUTO"	NEMA 4X Stainless Steel	120V Transformer type 1NO, 1NC	2	52C224S	
	B = Momentary flush pushbutton black, label "START" A = Momentary raised pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC	2	52C201X	
	B = Momentary flush pushbutton black, label "START" A = Momentary Mushroom head pushbutton red, label "STOP"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC	2	52C202X	
	B = Momentary flush pushbutton, label "UP" A = Momentary flush pushbutton, label "DOWN"	NEMA 4X Fiberglass	1NO, 1NC 1NO, 1NC	2	52C223X	
	B = Indicator light, red, label "RUN" A = Maintained selector switch, label "HAND-OFF-AUTO"	NEMA 4X Fiberglass	120V Transformer type 1NO, 1NC	2	52C224X	


① NEMA 4X Stainless Steel Enclosure is 304 SS.

Pushbutton Units and Indicator Lights

30mm Water, Oil Tight & Corrosion Resistant - Class 52

Class 52 oiltight pushbutton stations

Selection and ordering data

	Actuator identification	Degree of protection ^①	Contact / voltage	No. of command points	Order no.	Pack
						Unit
3 unit control station 	C = Indicator light, red	NEMA 12	120V 1NO, 1NC	3	52C307A	
	B = Momentary flush pushbutton black, label "START"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "FORWARD"	NEMA 12	1NO, 1NC	3	52C301A	
	B = Momentary flush pushbutton black, label "REVERSE"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "UP"	NEMA 12	1NO, 1NC	3	52C332A	
	B = Momentary flush pushbutton black, label "DOWN"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "OPEN"	NEMA 12	1NO, 1NC	3	52C333A	
	B = Momentary flush pushbutton black, label "CLOSE"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "HI"	NEMA 12	1NO, 1NC	3	52C334A	
	B = Momentary flush pushbutton, black label "LOW"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Indicator light, red	NEMA 4X Stainless Steel	120V 1NO, 1NC	3	52C307S	
	B = Momentary flush pushbutton black, label "START"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "FORWARD"	NEMA 4X Stainless Steel	1NO, 1NC	3	52C301S	
	B = Momentary flush pushbutton black, label "REVERSE"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "UP"	NEMA 4X Stainless Steel	1NO, 1NC	3	52C332S	
	B = Momentary flush pushbutton black, label "DOWN"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "OPEN"	NEMA 4X Stainless Steel	1NO, 1NC	3	52C333S	
	B = Momentary flush pushbutton black, label "CLOSE"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "HI"	NEMA 4X Stainless Steel	1NO, 1NC	3	52C334S	
	B = Momentary flush pushbutton, black label "LOW"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Indicator light, red	NEMA 4X Fiberglass	120V 1NO, 1NC	3	52C307X	
	B = Momentary flush pushbutton black, label "START"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "FORWARD"	NEMA 4X Fiberglass	1NO, 1NC	3	52C301X	
	B = Momentary flush pushbutton black, label "REVERSE"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "UP"	NEMA 4X Fiberglass	1NO, 1NC	3	52C332X	
	B = Momentary flush pushbutton black, label "DOWN"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "OPEN"	NEMA 4X Fiberglass	1NO, 1NC	3	52C333X	
	B = Momentary flush pushbutton black, label "CLOSE"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			
	C = Momentary flush pushbutton black, label "HI"	NEMA 4X Fiberglass	1NO, 1NC	3	52C334X	
	B = Momentary flush pushbutton, black label "LOW"		1NO, 1NC			
	A = Momentary raised pushbutton red, label "STOP"		1NO, 1NC			

① NEMA 4X Stainless Steel Enclosure is 304 SS.

Pushbutton Units and Indicator Lights

30 mm Heavy Duty, Watertight/Oiltight, Class 52

Legend plates for Class 51 and 52

Design

The 30 mm legend plates are approved for the use with both Class 51 and Class 52 devices.
Automotive legend plates require 2 1/2" mounting centers. Plastic legend plates will have white letters ingraved.

When ordering custom engraved legend plates, specify the required inscription text.

Selection and ordering data

Inscription	Large (1 7/16" x 2") Order No.	Automotive ^① (2 7/16" x 2 7/16") Order No.	Large Plastic ^② (1 7/16" x 2") Order No.	Automotive Plastic ^{①②} (2 7/16" x 2 7/16") Order No.
"Blank (brushed aluminum)"	52NL02	52NA02	—	—
"Blank (red)"	52NL02R	52NA02R	52ND02R	52NE02R
"Blank (Black)"	52NL02B	52NA02B	52ND02B	52NE02B
Inscribed legend plates with large brushed aluminum background				
Close	52NL18	52NA18	—	—
Down	52NL10	52NA10	—	—
Emerg Stop	52NL16	52NA16	—	—
Emerg Stop (red)	52NL16R	52NA16R	—	—
Fast-Slow	52NL33	52NA33	—	—
Forward	52NL05	52NA05	—	—
For-Off-Rev	52NL38	52NA38	—	—
For-Rev	52NL31	52NA31	—	—
Hand-Off-Auto	52NL37	52NA37	—	—
High	52NL07	52NA07	—	—
High-Low	52NL30	52NA30	—	—
High-Off-Low	52NL44	52NA44	—	—
In	52NL21	52NA21	—	—
Jog	52NL13	52NA13	—	—
Jog-Forward	52NL24	52NA24	—	—
Jog-Reverse	52NL25	52NA25	—	—
Low	52NL08	52NA08	—	—
Lower	52NL20	52NA20	—	—
Man-Auto	52NL35	52NA35	—	—
Off	52NL12	52NA12	—	—
Off-On	52NL26	52NA26	—	—
On	52NL11	52NA11	—	—
On-Off-Auto	52NL40	52NA40	—	—
Open	52NL17	52NA17	—	—
Open-Close	52NL34	52NA34	—	—
Open-Off-Close	52NL41	52NA41	—	—
Out	52NL22	52NA22	—	—
Pull to Start Push to Stop	52NL47	52NA47	—	—
Raise	52NL19	52NA19	—	—
Raise-Lower	52NL36	52NA36	—	—
Reset	52NL14	52NA14	—	—
Reverse	52NL06	52NA06	—	—
Run	52NL23	52NA23	—	—
Run-Jog	52NL29	52NA29	—	—
Safe-Run	52NL27	52NA27	—	—
Slow-Off-Fast	52NL39	52NA39	—	—
Start	52NL03	52NA03	—	—
Start-Jog	52NL28	52NA28	—	—
Start-Stop	52NL32	52NA32	—	—
Stop	52NL04	52NA04	—	—
Stop (red)	52NL04R	52NA04R	—	—
Up	52NL09	52NA09	—	—
Up-Down	52NL49	52NA49	—	—
Up-Off-Down	52NL42	52NA42	—	—
Inscription plates with custom engraving				
"Custom engraved (brushed aluminum)"	52NL02E	52NA02E	—	—
"Custom engraved (red)"	52NL02RE	52NA02RE	52ND02RE	52NE02RE
"Custom engraved (Black)"	52NL02BE	52NA02BE	52ND02BE	52NE02BE
Max. number of rows	2	2	2	2
Letter height	5/32"	1/4"	5/32"	1/4"
Characters per row	14	16	14	16

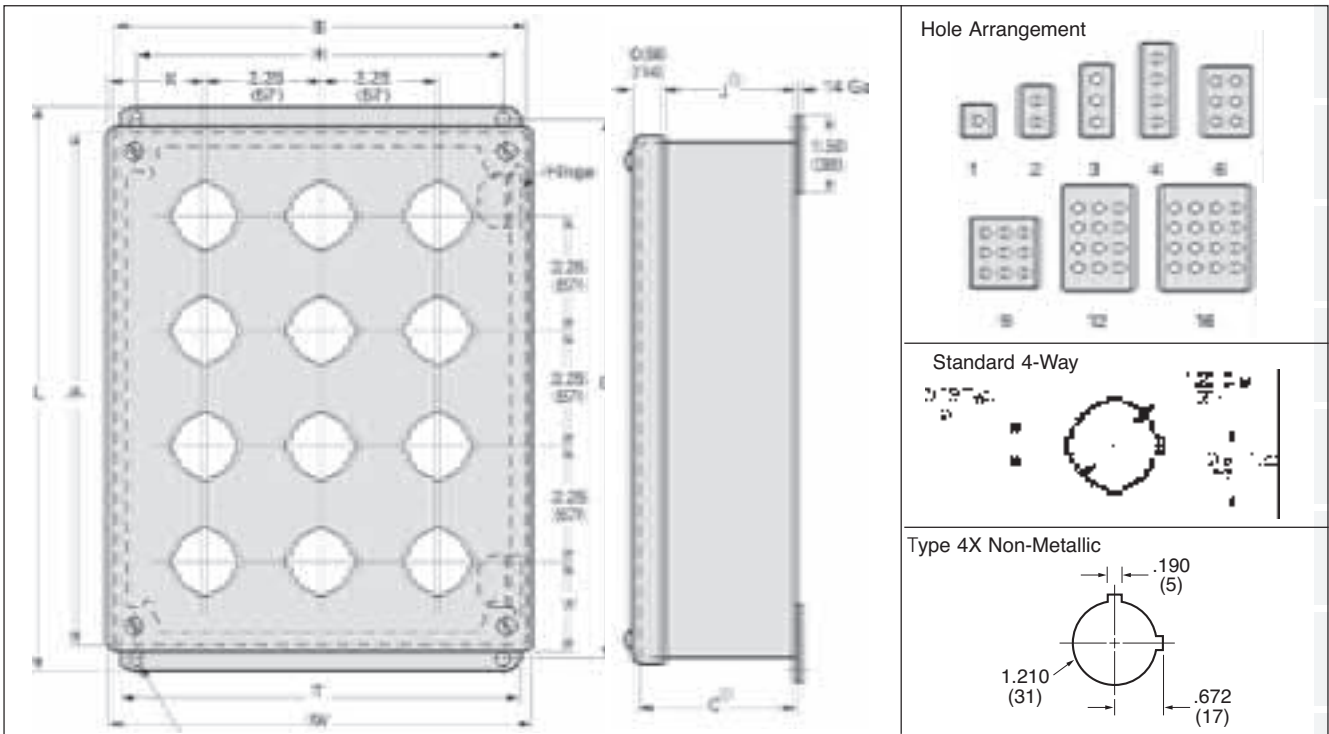
① Automotive requires 2 1/2" mounting centers

② White letters on plastic nameplate.

Pushbutton Units and Indicator Lights

30mm Heavy Duty, Watertight/Oiltight, Class 52

Dimensional drawings



Type 12/13 and 4X Stainless Steel

Units	Enclosure Size			Mounting		Overall					
	A	B	C	G	H	L	W	J	T	X	Y
1	3.50 (89)	3.25 (83)	2.75 (70)	4.00 (102)	2.38 (60)	4.50 (114)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
2	5.75 (146)	3.25 (83)	2.75 (70)	6.25 (159)	2.38 (60)	6.75 (171)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
3	8.00 (203)	3.25 (83)	2.75 (70)	8.50 (216)	2.38 (60)	9.00 (229)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
4	10.25 (260)	3.25 (83)	2.75 (70)	10.75 (273)	2.38 (60)	11.25 (286)	3.47 (88)	2.31 (59)	3.00 (76)	1.73 (44)	1.86 (47)
6	9.50 (241)	6.25 (159)	3.00 (76)	10.00 (254)	5.38 (137)	10.50 (267)	6.47 (164)	2.56 (65)	6.00 (152)	2.11 (54)	2.61 (66)
9	9.50 (241)	8.50 (216)	3.00 (76)	10.00 (254)	7.62 (194)	10.50 (267)	8.72 (221)	2.56 (65)	8.25 (210)	2.11 (54)	2.61 (66)
12	11.75 (298)	8.50 (216)	3.00 (76)	12.25 (311)	7.62 (194)	12.75 (324)	8.72 (221)	2.56 (65)	8.25 (210)	2.11 (54)	2.61 (66)
16 ²⁾	11.75 (298)	10.75 (273)	3.00 (76)	12.25 (311)	9.88 (251)	12.75 (324)	10.97 (279)	2.56 (65) ²⁾	10.50 (267)	2.11 (54)	2.61 (66)

Type 12/13 Extra Deep Enclosures

Units	Enclosure Size			Mounting		Overall					
	A	B	C	G	H	L	W	J	T	X	Y
1	4.00	4.00	4.75	4.50	3.12	5.00	4.22	4.31	3.75	2.11	2.11
2	6.00	4.00	4.75	6.50	3.12	7.00	4.22	4.31	3.75	2.11	1.98
3	8.00	4.00	4.75	8.50	3.12	9.00	4.22	4.31	3.75	2.11	1.86
4	10.00	4.00	4.75	10.50	3.12	11.00	4.22	4.31	3.75	2.11	1.73
6	9.50	6.25	4.75	10.00	5.38	10.50	6.47	4.31	6.00	2.11	2.61
9	9.50	8.50	4.75	10.00	7.62	10.50	8.72	4.31	8.25	2.11	2.61
12	11.75	8.50	4.75	12.25	7.62	12.75	8.72	4.31	8.25	2.11	2.61
16 ²⁾	11.75	10.75	4.75	12.25	9.88	12.75	10.97	4.31	10.50	2.11	2.61

Type 4X Non-Metallic

Units	Enclosure Size			Mounting		Overall	
	A	B	C	G	H	L	W
1	6.00	3.19	3.63	4.88	2.94	6.63	3.81
2	6.00	3.19	3.63	4.88	2.94	6.63	3.81
3	8.26	3.19	3.63	7.13	2.94	8.88	3.81
4	10.51	3.19	3.63	9.37	2.94	11.13	3.81

All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

- 1) Grounding stud in body of enclosure.
- 2) For stainless steel add 1.75 (45) to depth.

Pushbutton Units and Indicator Lights

30 mm Pilot Devices

• Revised •
08/15/14


Technical Specifications

Standards	UL Listed File # E22655	CSA Certified File # LR6535
Utilization	Category NEMA	A600/P600
Degree of Protection	52B, 52P-, 52S-, 52M- Operators	NEMA: 1, 3, 3R, 4, 4X, 12 and 13 IEC 529; IP10, IP11, IP14, IP52, IP54, IP56 and IP66

Rated Operational Current

NEMA A600 – 10 Continuous Amps			NEMA P600 – Rating Codes for DC Control	
Voltage AC	Make Amps	Break Amps	Circuit Application	
120V	60	6	Thermal Continuous Test Current Amps	5.0
240V	30	3	Maximum Make or Break; Current / Amps	
480V	15	1.5	125V	1.10
600V	12	1.2	250V	0.55
Total VA	7200	720	301-600V	0.20
			Maximum Make or Break	
			Volt amperes at 300V or Less	138

Contact Blocks	52BAK, -BAJ [Ⓢ] , -BAH, -BAU, -BJK [Ⓢ] 52BAR	600VAC Maximum, Heavy Duty 200VAC .25 Amp, 10 Watt Maximum 200VDC .50 Amp, 10 Watt Maximum
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Ⓢ  Positively driven contacts. Contact blocks are suitable for applications down to 5V/1MA low voltage applications as found in PLCs. 52BAR are Class 1; Division 2 Compliant

Pilot Light	Full Voltage	52PL4/52PL5	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V)	240V AC/DC Max.
	LED Module	or	-L (24V), -M (120V) -N (240V)	240V AC Max.
	Transformer Type	52BL4/52BL5	-G (120V), -H (240V), -J (480V), -K (600V)	600V AC Max., 50/60 Hz
Push-to-Test	Full Voltage	52PT6	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V)	240V AC/DC Max.
	LED Module	or	-L (24V), -M (120V), -N (240V)	240V AC Max.
	Transformer Type	52BT6	-G (120V), -H (240V), -J (480V), -K (600V)	600VAC Max., 50/60 Hz
Illuminated Push-Pull	Full Voltage	52PP2(3,7)	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V)	240V AC/DC Max.
	LED Module	or	-L (24V), -M (120V), -N (240V)	240V AC Max.
	Transformer	52BP2(3,7)	-G (120V), -H (240V), -J (480V), -K (600V)	600VAC Max., 50/60 Hz
Twist-to-Release	Full Voltage	52BR8	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V)	240V AC/DC Max.
	LED Module	or	-L (24V), -M (120V), -N (240V)	240V AC Max.
	Transformer	52PR8	-G (120V), -H (240V), -J (480V), -K (600V)	600VAC Max., 50/60 Hz
Illuminated Selector Switch	Full Voltage	52SA7(A,B,C)	-B (6-8V), -C (12V), -D (24V), -E (120V), -F (240V)	240V AC/DC Max.
	Transformer	52SX7(A,B,C)	-G (120V), -H (240V), -J (480V), -K (600V)	600V AC Max., 50/60 Hz

Dielectric Strength 2200V for one minute

Mechanical Design Life Cycles

Vibration	Frequency 5 - 60Hz.; Disp. .030 inches, sweep 5 minutes for a duration of 30 minutes on each axis. Not to exceed 5.5 G's for maximum of 1 minute.	
Pushbuttons	Momentary, Non-illuminated	5,000,000 Operating Cycles
	Momentary, Illuminated	300,000 Operating Cycles
Push-Pull	Maintained	300,000 Operating Cycles
	Momentary	2,000,000 Operating Cycles
Twist-to-Release		300,000 Operating Cycles
Selector Switches	Non-illuminated	2,000,000 Operating Cycles
	Illuminated, Key-operated	2,000,000 Operating Cycles
Contact Operation	Standard Contact Black Logic Reed	
Wire Gauge	#18-12 AWG	
Terminal Screw Torque	2-10 lb-in / 20 lb-in max; 8 lb-in recommended	
Locknut Torque	15 ft. lbs. max	
Temperature Range	Operating	31F to +158F (-35C to +70C)
	Storage	40F to +185F (-40C to +85C)

All parts are designed and manufactured of corrosion resistant material or are plated or painted as corrosion protection. All contact block contacts are gold flashed as a standard offering. Internal return spring mechanisms of operators and contact blocks of stainless steel. RoHS Compliant.

Declaration of Conformity — The products listed below, to which this declaration relates, are in conformity with the following standards, following the provisions of the Low Voltage Directive (LVD) (73/23/EEC), and the Electromagnetic Compatibility Directive (89/336/EEC.)

Products: Contact Blocks: Cat Nos. 52BAE, 52BAH, 52BAJ, 52BAK, 52BAR, 52BAU and 52BJK, with suffixes. Pilot Lights: Cat Nos 52P, with suffixes. Operators: Cat Nos 52S or 52P, with suffixes.

Applicable Standards: EN 60947-5-1 Low-Voltage Switchgear and controlgear. Enclosed devices meet the requirements of environmental ratings of IP10, IP11, IP14, IP52, IP54, and IP56. Open devices, when mounted as instructed, in environmental type IP10, IP11, IP14, IP52, IP54 or IP56 enclosures, maintain the environmental requirements for those enclosure types. Cat. No. 52BP, 52BR, 52PP, and 52PR, 2 Position, Twist-To-Release and 2 Position, Push Pull Maintained operators provided with red operating heads and 52BJK contact blocks meet the requirements of EN 60947-5-5 for Electrical Emergency Stop Device With Mechanical Latching Function (e-stop).

SIRIUS RELAYS

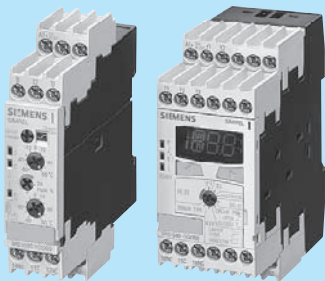
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3RS10/3RS11 temperature
monitoring relays



**3RS10/3RS20 temperature
monitoring relay
for RTD or Thermocouple** Page

Selection and ordering data

- Overview 11/4
- Screw and Spring-type
connection 11/5

Technical data 11/7
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3RN1 thermistor
motor protection



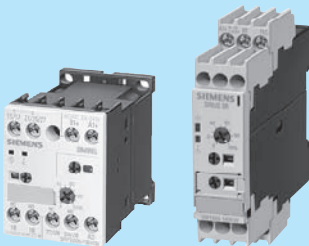
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for PTC temperature detectors** Page

Selection and ordering data

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Solid-State Time Relays



**3RP20/3RP15 solid-state time
relays** Page

Selection and ordering data

- Overview 11/20
- Screw and Spring-type
connection 11/21

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Solid-State Time Relays



**7PV solid-state
relay** Page

Selection and ordering data

- Screw connection 11/27
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**3RT19 time delay blocks for
mounting on contactors**

Selection and ordering data

- See Section 2

3UG3/4 monitoring relays



For electrical quantities

Selection and ordering data

- Selection Data 11/31

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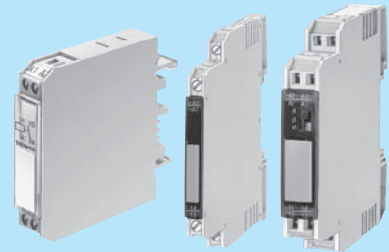
For non-electrical quantities

Selection and ordering data

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Coupling relays and interfaces



3TX70 relay and semiconductor interfaces

Selection and ordering data

- Selection Data 11/64

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Position of terminals	11/73
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Coupling relays and interfaces



3RS17 interface converter

Selection and ordering data

- Screw and Spring-type connection 11/77

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3TG10 power relay, 20A max. resistance load pole

Selection and ordering data

- AC and DC operation, hum-free
With screw connection or tab connector 11/81
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Application	11/81
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Position of terminals	11/84
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3TX71 general purpose plug-in relays

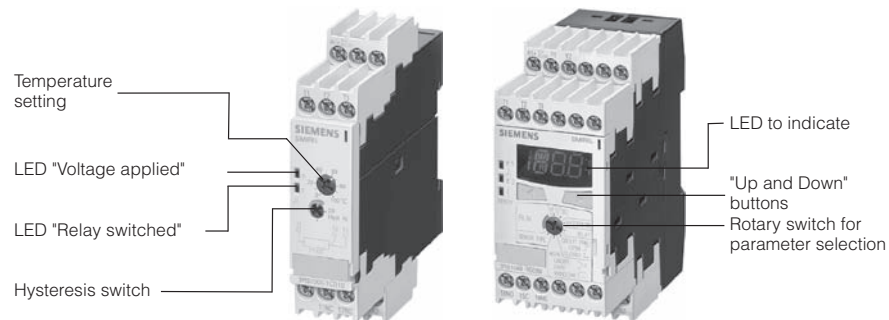
Selection and ordering data

- AC and DC operation 11/85

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Overview

The 3RS1/3RS2 SIMIREL temperature monitoring relays can be used for measuring temperatures in solid, liquid and gaseous media. The temperature is acquired by the sensor in the medium, evaluated by the device and monitored for overshoot, undershoot or within a range (window function). The family consists of analog adjustable devices with one or two threshold values and digital devices that represent an excellent alternative to thermostats in the low-end performance range. The output relay picks up and releases at the threshold values in accordance with the parameter settings.



Analog evaluation units

- Sensor types: PT100/Type J/Type K
- Measuring principle for 2- and 3-wire sensors
- Electrical isolation between sensor and supply voltage (with the exception of AC/DC 24 V devices)
- Separate designs for overshoot and undershoot
- Measuring range depending on the version for:
 - 50 °C to +50 °C,
 - 0 °C to 100 °C,
 - 0 °C to 200 °C,
 - 0 °C to 600 °C or
 - 500 °C to 1000 °C
- Potentiometer for adjustable limit temperature and hysteresis of 2 to 20 %
- Closed-circuit principle
- Narrow 22.5 mm enclosure with 12 terminals

With one threshold value

- Supply voltage for AC/DC 24 V or AC 110/230 V
- Indication of supply voltage and relay status via LEDs
- One NO and one NC contact

With two threshold values

- Additional potentiometer for $\Delta 2$ (hysteresis for second limit value is 5 % of the measuring range)
- Supply voltage for AC/DC 24 V or 24 to 240 V
- LED indication of supply voltage and both relay states
- Open-circuit/closed-circuit principle switchover
- One NO and one CO contact

Digital evaluation units

- High-end evaluation unit for 1 or 1-3 sensor circuits
- Multifunctional digital display and three LEDs (for threshold values and Ready)
- Adjustable sensor types
- Adjustable overshoot, undershoot or window function
- Switchable open-circuit or closed-circuit principle
- Hysteresis for both threshold values (1 to 99 K)
- Memory function can be selected by means of an external control signal (Y1/Y2)
- One NO and two SPDT contacts
- Adjustable time delay from 0 to 999 s
- Wire-break and short-circuit detection with separate signaling contact (1 NO)
- Non-volatile storage of the set parameters
- 45 mm housing with 24 supply terminals
- Measuring principle for 2- and 3-wire sensors
- Electrical isolation (with the exception of AC/DC 24 V devices)
- In the 3-sensor design, the status of the individual sensors is indicated on limit value overshoot/undershoot

It clearly displays which of the connected sensors has overshoot or undershoot one or both threshold values.

Advantages

- All devices are with Cage Clamp terminals
- All devices with the exception of AC/DC 24 V devices are electrically isolated
- Variants for the evaluation of 1 to 3 sensors in one unit, e.g. for multiple monitoring in a plant or for motor protection
- Easy operation without complex menu systems
- Graduated product range; the right device for every application
- High-end evaluation units with digital display – can be used for a wide temperature range and for different sensor types
- Adjustable hysteresis
- Rapid fault diagnosis due to short-circuit monitoring and sensor wire-break detection
- Power packs with wide range of input voltage reduce the number of variants
- Easy configuration for either two-point or three-point closed-loop control

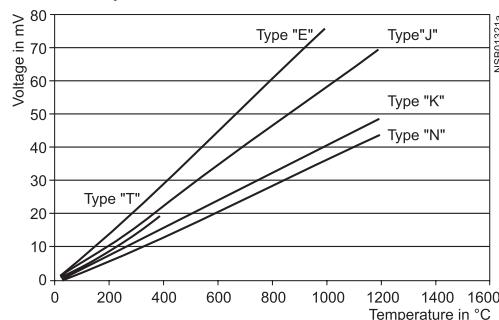
Application

The 3RS1/3RS2 SIMIREL temperature monitoring relays can be used in almost any application in which limit temperatures must not be overshoot or undershoot, e.g.:

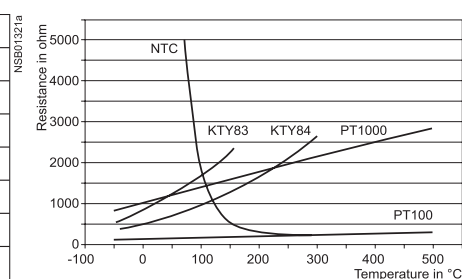
- Monitoring of set limit temperatures and output of alarm messages for:
 - Motor and plant protection
 - Switchgear cabinet temperature monitoring
 - Frost monitoring
 - Temperature limits for process variables, e.g. in the packaging industry or galvanising equipment
 - Control of plants and machines such as heating, air-conditioning and ventilation systems, solar collectors, heat pumps or warm water supplies
 - Monitoring of servo motors with KTY sensors
 - Bearing and gearbox oil-level monitoring
 - Monitoring of cooling liquids

Characteristics for thermocouples and resistance sensors

Thermocouples



Resistance sensors



3RS10/3RS11 Temperature monitoring relays					
Sensor	Function	Measuring range	Rated control supply voltage V _s 50–60 Hz AC	Order No.	List Price \$
Analog setting, 1 threshold value, 22.5 mm wide; analog closed-circuit principle, no holding on supply failure function; 1 NO + 1 NC					
PT100 (resistance sensor)	Overrange	–50...+50 °C	24 V AC/DC	3RS10 00-□CD00	
			110/230 V AC	3RS10 00-□CK00	
		0...+100 °C	24 V AC/DC	3RS10 00-□CD10	
			110/230 V AC	3RS10 00-□CK10	
		0...+200 °C	24 V AC/DC	3RS10 00-□CD20	
			110/230 V AC	3RS10 00-□CK20	
	Underrange	–50...+50 °C	24 V AC/DC	3RS10 10-1CD00	
			110/230 V AC	3RS10 10-1CK00	
		0...+100 °C	24 V AC/DC	3RS10 10-1CD10	
			110/230 V AC	3RS10 10-1CK10	
0...+200 °C		24 V AC/DC	3RS10 10-1CD20		
		110/230 V AC	3RS10 10-1CK20		
Typ J (thermocouple)	Overrange	0...+200 °C	24 V AC/DC	3RS11 00-□CD20	
			110/230 V AC	3RS11 00-1CK20	
		0...+600 °C	24 V AC/DC	3RS11 00-1CD30	
			110/230 V AC	3RS11 00-1CK30	
Typ K (thermocouple)	Overrange	0...+200 °C	24 V AC/DC	3RS11 01-□CD20	
			110/230 V AC	3RS11 01-1CK20	
		0...+600 °C	24 V AC/DC	3RS11 01-1CD30	
			110/230 V AC	3RS11 01-1CK30	
		+500...+1000 °C	24 V AC/DC	3RS11 01-1CD40	
			110/230 V AC	3RS11 01-1CK40	
Analog setting for alarm and trip (2 threshold values), 22.5 mm wide; open-circuit – closed-circuit current principle can be toggled between; no holding on supply failure function; 1 NO + 1 CO					
PT100 (resistance sensor)	Overrange	–50...+50 °C	24 V AC/DC	3RS10 20-1DD00	
			24–240 V AC/DC	3RS10 20-1DW00	
		0...+100 °C	24 V AC/DC	3RS10 20-1DD10	
			24–240 V AC/DC	3RS10 20-1DW10	
		0...+200 °C	24 V AC/DC	3RS10 20-1DD20	
			24–240 V AC/DC	3RS10 20-□DW20	
	Underrange	–50...+50 °C	24 V AC/DC	3RS10 30-1DD00	
			24–240 V AC/DC	3RS10 30-1DW00	
		0...+100 °C	24 V AC/DC	3RS10 30-1DD10	
			24–240 V AC/DC	3RS10 30-1DW10	
0...+ 200 °C		24 V AC/DC	3RS10 30-□DD20		
		24–240 V AC/DC	3RS10 30-1DW20		
Typ J (thermocouple)	Overrange	0...+200 °C	24 V AC/DC	3RS11 20-□DD20	
			24–240 V AC/DC	3RS11 20-1DW20	
		0...+600 °C	24 V AC/DC	3RS11 20-1DD30	
			24–240 V AC/DC	3RS11 20-1DW30	
Typ K (thermocouple)	Overrange	0...+200 °C	24–240 V AC/DC	3RS11 21-1DW20	
		0...+600 °C	24–240 V AC/DC	3RS11 21-1DW30	
		+500...+1000 °C	24 V AC/DC	3RS11 21-1DD40	
			24–240 V AC/DC	3RS11 21-1DW40	

Analog setting evaluation devices with one and two threshold values. For analog setting devices, the threshold values and the hysteresis from 2 to 20% are set using a rotary potentiometer. For devices with 2 threshold values, the selectable hysteresis only acts on threshold value 1. For the second threshold value, the hysteresis is permanently set to 5%. This series of products was developed for applications where a setting accuracy of ± 5% is sufficient.

Screw Terminal 1
Spring-type Terminal 2

Function Relays, Interfaces and Converters

Temperature Monitoring Relays

SIRIUS
RELAYS

3RS10/3RS11

Sensor	Measuring range (measuring range limit depends on the sensor)	Rated control supply voltage V _S 50–60 Hz AC	Order No.	List Price \$
"Temperature monitor" acc. to DIN 3440, digital settings, 2 threshold values, 45 mm wide; 1 CO + 1 CO + 1 NO, memory function can be enabled using an external jumper. Relay parameters have a holding on supply failure function				
PT100/1000; KTY83/84; NTC (resistance sensor) ¹⁾	–50...+500 °C	24 V AC/DC 24–240 V AC/DC	3RS10 40-□GD50 3RS10 40-□GW50	
	–50...+932 °F	24 V AC/DC 24–240 V AC/DC	3RS20 40-□GD50 3RS20 40-□GW50	
TYPE J, K, T, E, N (thermocouple)	–99...+999 °C	24 V AC/DC 24–240 V AC/DC	3RS11 40-□GD60 3RS11 40-□GW60	
	–99...+1830 °F	24 V AC/DC 24–240 V AC/DC	3RS21 40-□GD60 3RS21 40-□GW60	
"Temperature limiter" and "temperature monitor" acc. to DIN 3440, digital settings, 2 threshold values, 45 mm wide; 1 CO + 1 CO + 1 NO, tripped state and relay parameters are saved using a holding on supply failure function				
PT100/1000; KTY83/84; NTC (resistance sensor) ¹⁾	–50...+750 °C	24 V AC/DC 24–240 V AC/DC	3RS10 42-□GD70 3RS10 42-□GW70	
	–99...+1800 °C	24 V AC/DC 24–240 V AC/DC	3RS11 42-□GD80 3RS11 42-□GW80	

Motor monitoring relays, digital settings for up to 3 sensors, 45 mm wide; 1 CO + 1 CO + 1 NO

Sensor	No of sensors	Measuring range	Rated control supply voltage V _S	Order No.	List Price \$
PT100/1000; KTY83/84; NTC (resistance sensor) ¹⁾	1 to 3 sensors	–50...+500 °C	24–240 V AC/DC	3RS10 41-□GW50	
		–50...+932 °F	24–240 V AC/DC	3RS20 41-□GW50	

¹⁾ NTC type: B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ)

Screw Terminal **1**

Spring-type Terminal **2**

The short-circuit and wire breakage detection, as well as the measuring range are restricted, depending on the sensor type:

Measuring ranges in °C for thermocouple

Sensor type	Short- circuit	Wire breakage	3RS11 40 measuring range	3RS11 42 measuring range
J	–	x	–99...999	–99...1200
K	–	x	–99...999	–99...1350
T	–	x	–99...400	–99...400
E	–	x	–99...999	–99...999
N	–	x	–99...999	–99...999
S	–	x	–	0...1750
R	–	x	–	0...1750
B	–	x	–	400...1800

Measuring ranges in °C for resistance sensors

Sensor type	Short- circuit	Wire breakage	3RS10 40 measuring range	3RS10 42 measuring range
PT100	x	x	–50...500	–50...750
PT1000	x	x	–50...500	–50...500
KTY83-110	x	x	–50...175	–50...175
KTY84	x	x	–40...300	–40...300
NTC ¹⁾	x	–	80...160	80...160

¹⁾ NTC type: B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ)

Evaluation units with digital settings

Temperature monitoring relays distinguish themselves due to the fact that they are extremely easy-to-use.

The actual temperature is always displayed on the three-digit LED display. A dedicated relay with one NO contact is integrated to monitor the sensor.

The relay is switched-out in the parameterizing mode.

The following parameters can be set:

- Sensor type
- 2 threshold values J₁, J₂
- 1 hysteresis; this acts on both thresholds (0–99 K)
- 1 delay time; this acts on both thresholds (0–9999 s)
- Either the open-circuit/closed-circuit principle can be selected
- Function: Overtemperature/Undertemperature (overrange/underrange) or window monitoring within a defined range

Versions with a wide-range voltage have electrical isolation.

The temperature ranges are dependant on the sensor type (refer to the function).

Technical data									
General data									
Type		3RS10 00 3RS10 10	3RS11 00	3RS11 01	3RS10 20 3RS10 30	3RS11 20 3RS11 30	3RS11 21 3RS11 31	3RS.0 40 3RS.0 41	3RS.1 40
Sensor type		PT100	TC Type J	TC Type K	PT100	TC Type J	TC Type K	PT100; 1000 KTY83 / 84; NTC	TC Type J, K, T, E, N
Width	mm	22.5						45	
Operating range	V	0.85 to 1.1 x U _s							
Rated power	W/VA	< 2 / 4						< 4 / 7	
Auxiliary circuit									
Contacts		1 NO + 1 NC			1 SPDT + 1 NO			1 SPDT + 1 SPDT + 1 NO	
Rated operational current I _e									
AC15 at AC 230 V, 50 Hz	A	3							
DC13 at 24 V	A	1							
DC13 at 240 V	A	0.1							
Required DIAZED fuse									
Utilisation category	gL/gG	A	4						
Electrical endurance	AC 15 at 3 A	100,000							
Mechanical endurance									
Mechanical operating cycles		30 x 10 ⁶							
Tripping unit									
Measuring accuracy at 20°C ambient temperature (T20)		typically < ± 5% of upper limit of scale						< ± 2K ± 1 digit	< ± 5K ± 1 digit
Reference point accuracy		–	< ± 5 K		–	< ± 5 K		–	< ± 5 K
Deviations due to ambient temperature in % of measuring range	%	<2	<3		<2	<3		0.05 °C per K deviation from T20	
Measuring cycle	ms							500	
Hysteresis adjustments									
for temperature 1		2 to 20 % of upper limit of scale						1 to 99 Kelvin, for both values	
for temperature 2		5 % of upper limit of scale							
Sensor circuit									
Typical sensor current									
PT100	mA	Typically 1	–		Typically 1	–		Typically 1	–
PT1000 / KTY83 / KTY84 / NTC	mA	Typically 0.2	–		Typically 0.2	–		Typically 0.2	–
Wire-break detection		No						Yes ¹⁾	Yes
Short-circuit detection		No						Yes	No
3-wire connection		Yes ²⁾	–		Yes ²⁾	–		Yes ²⁾	–
Enclosure									
Environmental effects									
Permissible ambient temperature	°C	– 25° to 60°							
Permissible storage temperature	°C	– 40° to 80°							
Permissible mounting position		any							
Degree of protection to EN 60 529		Terminals: IP20; cover: IP40							
Rated insulation voltage U _i (pollution degree 3)	AC V	300							
Conductor cross-section									
Screw terminals									
– solid	mm ²	M 3.5 (for standard screwdriver Size 2 and Pozidriv 2)							
– finely stranded, with end sleeves	mm ²	1 x (0.5 to 4) / 2 x (0.5 to 2.5)							
– solid or stranded AWG conductors	AWG	1 x (0.5 to 2.5) / 2 x (0.5 to 1.5)							
– Tightening torque	Nm	2 x (20 to 14)							
		0.8 to 1.2							
Cage Clamp terminals									
– solid	mm ²	2 x (0.25 to 1.5)							
– finely stranded, with end sleeves	mm ²	2 x (0.25 to 1)							
– finely stranded, without end-sleeves	mm ²	2 x (0.25 to 1.5)							
– solid or stranded AWG conductors	AWG	2 x (24 to 16)							
– corresponding opening tool		8WA2 807							
Vibration performance IEC 68-2-6		5 to 26 Hz/0.75 mm							
Shock resistance IEC 68-2-27		15 g/11 ms							

1) Not for NTC (B57227-K333-A1
(100 °C:1.8 kΩ; 25 °C:32,762 kΩ).

2) 2-wire connection of resistance sensors
with wire jumper between T2 and T3.

Configuration

Specifications

The temperature monitoring relays correspond to:

- IEC 60 721-3-3 "Environmental conditions"
- IEC 947-5-1; DIN VDE 0660 "Low-voltage switchgear and controlgear"
- EN 50 081-2 "Basic technical standard for emitted interference (industry)"
- EN 61 000-6-2 "Basic technical standard for interference immunity (industry)"
- DIN EN 50 042 "Terminal marking"
- UL/CSA under application

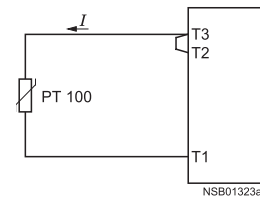
Connection of resistance thermometers

2-wire measurement

When 2-wire temperature sensors are used, the sensor resistance is added to the wire resistance. The system error that results must be taken into

account when the parameters are set for the evaluation unit. A jumper must be clamped between terminals T2 and T3.

The following table can be used to determine the temperature error when a PT100 is used.



Error due to wiring

The error that arises due to the wiring is approx. 2.5 Kelvin/ohm. If the resistance of the wiring is not known and cannot be measured, the wiring error can be estimated by means of the following table.

Temperature error as a function of conductor length and cross-section with PT 100 sensors and 20°C ambient temperature, in K

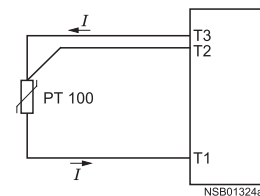
Cable length in m	Cross-section mm ²			
	0.5	0.75	1	1.5
0	0.0	0.0	0.0	0.0
10	1.8	1.2	0.9	0.6
25	4.5	3.0	2.3	1.5
50	9.0	6.0	4.5	3.0
75	13.6	9.0	6.8	4.5
100	18.1	12.1	9.0	6.0
200	36.3	24.2	18.1	12.1
500	91.6	60.8	45.5	30.2

3-wire measurement

To minimise the effects of the wiring resistances, a 3-wire circuit is usually used.

Using the additional wire, it is possible for two measuring circuits to be formed of which one is used as a reference.

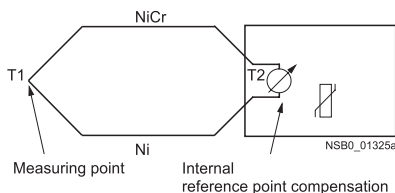
The evaluation unit can then automatically calculate the wiring resistance and take it into account.



Connection of thermoelements

A differential temperature measurement is obtained from the thermo-electrical effect

between the measuring point and the evaluation unit.



This principle assumes that the evaluation unit knows the temperature at the terminal (T2). The 3RS11 temperature monitoring relays have a built-in reference point correction function that determines this reference temperature and uses it to generate the measurement result.

The absolute temperature is therefore calculated from the ambient temperature of the evaluation unit and the temperature difference measured by the thermoelement.

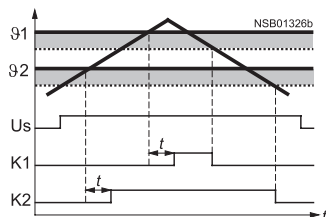
In this manner, temperature acquisition (T1) is possible without knowing the precise ambient temperature at the terminals of the evaluation unit (T2).

The connecting lead is only permitted to be extended using equalising conductors made from the same material as the thermoelement itself. If a different type of lead is used, the measurement will be inaccurate.

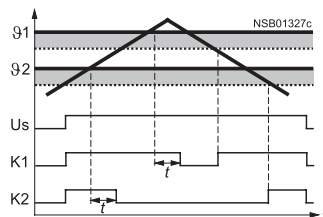
Functions

Temperature overshoot

Open-circuit principle



Closed-circuit principle



Digital evaluation units:

After the temperature has reached the set threshold value ϑ_1 , output relay K1 changes its switching state appropriately as soon as the set time t has elapsed (K2 responds to ϑ_2 similarly).

Analog evaluation units:

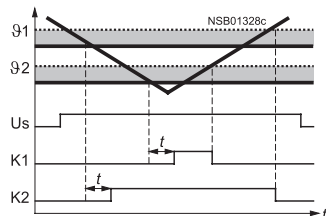
When the set threshold value is reached, output relay K1 changes its switching status. For devices with 2 threshold values, relay K2 responds to the second set threshold value.

As soon as the temperature reaches the respective set hysteresis value, the relays return immediately to the original state.

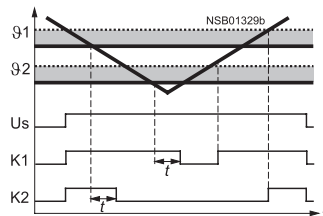
A time delay cannot be set ($t = 0$).

Temperature undershoot

Open-circuit principle

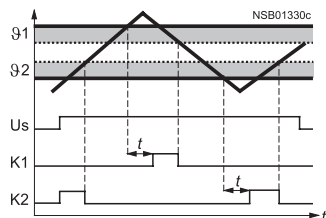


Closed-circuit principle

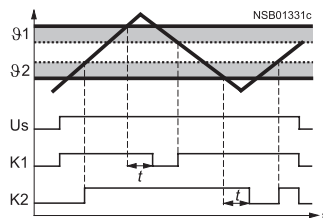


Window monitoring

Open-circuit principle



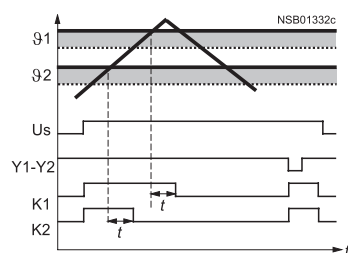
Closed-circuit principle



When the temperature has reached the upper threshold ϑ_1 and the set delay time t has elapsed, the output relay K1 changes its switching state. As soon as the temperature reaches the respective set hysteresis value, the relay returns immediately to the original state.

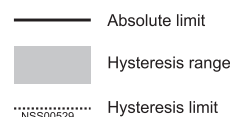
In the same manner, K2 responds to the lower threshold value of ϑ_2 .

Principle of operation with memory function, based on the example of temperature overshoot using the closed-circuit principle



When the temperature has reached the set threshold ϑ_1 and the set delay time t has elapsed, the output relay K1 changes its switching state (similarly, K2 responds to ϑ_2 .)

The relays will only return to the original state when the temperature has fallen below the respective set hysteresis value and the connection Y1-Y2 was briefly interrupted.



Function Relays, Interfaces and Converters

Temperature Monitoring Relays

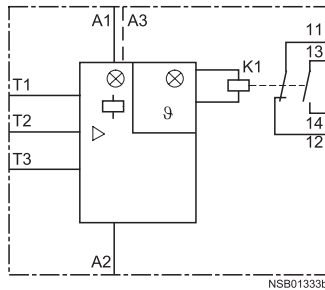
SIRIUS
RELAYS

3RS10/3RS11

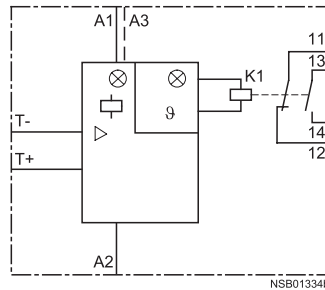
Circuit diagrams

Connection examples

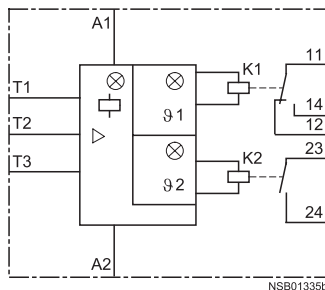
3RS10 00
3RS10 10



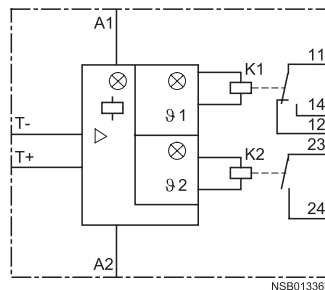
3RS11 00
3RS11 01



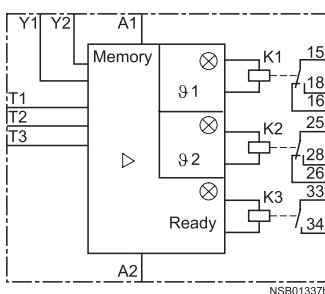
3RS10 20
3RS10 30



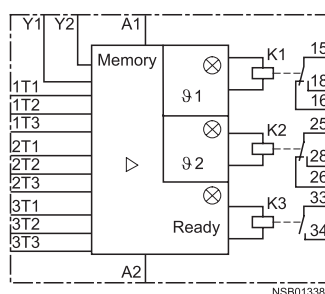
3RS11 20/3RS11 30
3RS11 21/3RS11 31



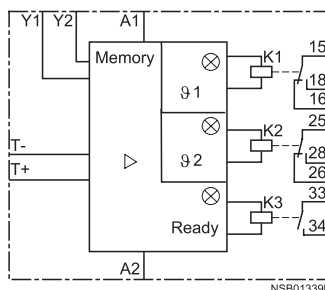
3RS10 40
3RS20 40



3RS10 41
3RS20 41



3RS11 40
3RS21 40



General equipment designations

A1, A2, A3 Rated control supply voltage terminals
K1, K2, K3 Output relays

Equipment designations for:
3RS1000, 3RS1010, 3RS1101, 3RS1100,
3RS1110, 3RS1111, 3RS1020, 3RS1021,
3RS1030, 3RS1031

□ = LED: "Voltage applied"
⊗1 = LED: "Relay 1 switched"
⊗2 = LED: "Relay 2 switched"
T1 to T3 = Terminals for connection of resistance sensor
T+ / T- = Terminals for connection of thermoelements

Equipment designations for:
3RS1040, 3RS1140, 3RS2040, 3RS2140

⊗1 = LED: "Relay 1 switched"
⊗2 = LED: "Relay 2 switched"
Ready = LED: "Device operating"
T1 to T3 = Terminals for connection of resistance sensor
T+ / T- = Terminals for connection of thermoelements
Y1/Y2 Terminals for memory jumper
JBiQ

Equipment designations for:
3RS1041, 3RS2041

⊗1 = LED: "Relay 1 switched"
⊗2 = LED: "Relay 2 switched"
Ready = LED: "Device operating"

1T1 to 1T3 = Terminals for connection of resistance sensor 1
2T1 to 2T3 = Terminals for connection of resistance sensor 2
3T1 to 3T3 = Terminals for connection of resistance sensor 3
Y1/Y2 Terminals for memory jumper

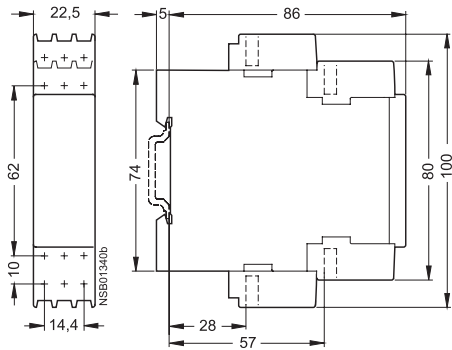


Important!
When resistance sensors are used in a 2-wire connection, a jumper must be installed between T2 and T3.

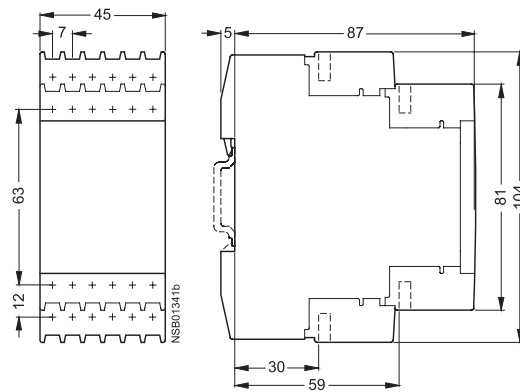
Dimension drawings

Temperature monitoring relay

3RS10/3RS11 .. with 22.5 mm enclosure



3RS20/3RS21
3RS10/3RS11 .. with 45 mm enclosure



3RN1 for PTC temperature sensors

Overview

3RN10 00 compact tripping unit

The compact unit is equipped with a red LED (TRIPPED) to indicate tripping and a SPDT contact.

After the device has tripped, it is reset automatically after the thermistors have cooled down. The common contact of the SPDT contact is connected to the control voltage.

This device is particularly suitable in circuits in which the control circuit and signalling circuit are at the same potential, e.g. in local control boxes.

3RN10 10, 10 11, 10 12 standard tripping unit

The standard units are equipped with two LEDs (READY and TRIPPED) and with 1NO and 1NC for switch-off and signalling. They are available with automatic RESET (3RN10 10), manual RESET (3RN10 11) or manual/automatic and remote RESET (3RN10 12). The 3RN10 12 unit holds on supply failure. If the control voltage fails, a previous trip will be memorised.

A remote RESET function is implemented by connecting an external pushbutton with an NO contact to terminals Y1 and Y2. If terminals Y1 and Y2 are bridged, tripping is followed by an automatic RESET.

3RN10 13 multifunction tripping unit

In the 3RN10 13 thermistor motor protection tripping units, the sensor circuit is also monitored for a short circuit. Tripping due to a short circuit is indicated by a flickering red LED. The monostable design also indicates a wire-break in the sensor circuit by flashing of the red LED. The 3RN10 13 tripping unit is equipped with manual, remote and automatic RESET functions. The TEST/RESET button can be used to manually reset the tripping unit.

A remote RESET function is implemented by connecting an external pushbutton with an NO contact to terminals Y1 and Y2. If terminals Y1 and Y2 are bridged, tripping is followed by an automatic RESET.

Response of the tripping unit to failure of the control voltage

Response	Monostable 3RN10 00 3RN10 10 3RN10 11	Holding on supply failure	
		Monostable 3RN10 12 3RN10 13-... 0 3RN10 22 3RN10 62	Bistable 3RN10 13-... 01
at			
Failure of the control voltage	Device trips	Device trips	No change in switching status of the auxiliary contacts
Control voltage returns without previous tripping	Device resets	Device resets	
Control voltage returns after tripping	Device resets	Device remains tripped	

3RN10 22 tripping unit "Warning and switch-off"

Two sensor circuits can be connected to one 3RN10 22 tripping unit and act on one output relay with 1 NO for warning and 1 SPDT for switch-off. The functions "Warning" and "Switch-off" are implemented by means of temperature sensors with different rated response temperatures TNF. Activation of the sensor circuit for "Warning" is indicated by a yellow LED and for "Switch-off" by a red LED.

The sensor circuits have different reset responses:

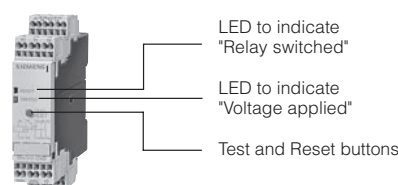
- "Warning" (terminals 2T1, T2) automatic RESET only
 - "Switch-off" (terminals 1T1, T2); changeover from manual RESET to automatic RESET by bridging terminals Y1 and Y2.
- A remote RESET function is implemented by connecting an external pushbutton with an NO contact.

3RN10 62 tripping unit "Multiple motor protection"

Up to six sensor circuits can be connected to one 3RN10 62 tripping unit which all act on one output relay. Simultaneous protection of several motors (up to 6) is an advantage in the case of group drives (e.g. if a motor is overloaded, all motors in the group can be switched off). Apart from the red LED "TRIPPED" that indicates the switching status of the tripping unit, a LED is assigned to each sensor circuit that is lit when the associated sensor circuit trips. Sensor circuits that are not required must be short circuited.

The reset response of the 3RN10 62 tripping units can be changed from manual RESET to automatic RESET by bridging terminals Y1 and Y2. A remote RESET function is implemented by connecting an external pushbutton with an NO contact.

3RN10 12-2C...



Application

The 3RN1 thermistor motor protection tripping units are thermal protective devices that can be used in conjunction with PTC thermistors Type A for the temperature monitoring of electrical drives, transformer windings, oils, bearings, air, etc.

Principle of operation

The 3RN1 tripping units operate according to the closed-circuit principle and therefore monitor themselves for a wire-break. A temporary voltage drop of less than 200 ms (for devices with a wide input voltage range < 100 ms) will not cause a change in status of the auxiliary contacts. The 3RN10 13 multifunction tripping unit also features short-circuit detection in the sensor circuit. The unit will trip if a short circuit arises in the sensor circuit (resistance in sensor circuit < 20 Ω). The tripping units feature electrical isolation between the

control circuit and sensor circuit in the case of AC and UC control supply voltages (for DC control supply voltage: no electrical isolation). For units with a TEST button, the function of the device can be checked by pressing the button for longer than 2 s.

Safe electrical isolation

All electrical circuits (outputs, control circuit, sensor and Reset circuit) of the 3RN1013-1BW10 multifunction tripping unit (wide input voltage range, monostable output relay and screw terminals) are safely isolated from each other up to a rated voltage of 300 V acc. to DIN VDE 0100 Part 410/ DIN VDE 0106/DIN VDE 0160.

Notes

- ⚠ For DC-activated tripping units, electrical isolation must be provided using a battery system or a safety isolating transformer to DIN VDE 0551.
- ⚠ When tripping units with an automatic RESET function are used in EEx e zones, the control circuit must be designed to ensure that the monitored machine cannot restart autonomously.
- ⚠ In the case of tripping units without short-circuit detection, the sensor circuit must be measured with a suitable measuring instrument during commissioning. For resistance < 50 Ohm, the sensor circuit must be checked for a short circuit.
- ⚠ When the 3RN10 00 unit (no Ready LED) and the 3RN10 13-1BW1 unit (no change in switching status for the auxiliary contacts on control voltage failure) are used to protect EEx e motors, separate monitoring of the control voltage is recommended.

Thermistor motor protection relays for PTC thermistors (type A PTCs)					
All of the devices with the exception of 24 V AC/DC have electrical isolation					
Version	Reset	Contacts	Control supply voltage	Order No..	List Price \$
Compact evaluation units, 22.5 mm wide, monostable, closed-circuit current principle, 1 LED					
Terminal A1 is connected to the common of the changeover contact	Auto	1 CO	24 V AC/DC	3RN1000-□AB00	
			110 V AC	3RN1000-□AG00	
			230 V AC	3RN1000-□AM00	
Standard evaluation units, 22.5 mm wide, monostable, closed-circuit current principle, 2 LEDs					
Short-circuits are detected in the sensor circuit	Auto	1 NO + 1 NC	24 V AC/DC	3RN1010-□CB00	
			110 V AC	3RN1010-□CG00	
			230 V AC	3RN1010-□CM00	
			24–240 V AC/DC	3RN1010-□CW00	
		2 CO	24 V AC/DC	3RN1010-□BB00	
			110 V AC	3RN1010-□BG00	
			230 V AC 230 V	3RN1010-□BM00	
			2 CO hard-gold-plated	24 V AC/DC	3RN1010-□GB00
	Manual/ remote ³⁾	1 NO + 1 NC	24 V AC/DC	3RN1011-□CB00	
			110/230 V AC	3RN1011-□CK00	
		2 CO	24 V AC/DC	3RN1011-□BB00	
			110 V AC	3RN1011-□BG00	
			230 V AC	3RN1011-□BM00	
			2 CO hard-gold-plated	24 V AC/DC	3RN1011-□GB00
Holding on supply failure ²⁾	Manual/auto/ remote	1 N + 1 NC	24 V AC/DC	3RN1012-□CB00	
			110/230 V AC	3RN1012-□CK00	
Holding on supply failure ²⁾ , short-circuits are detected in the sensor circuit	Manual/auto/ remote	2 CO	24 V AC/DC	3RN1012-□BB00	
			110 V AC	3RN1012-□BG00	
			230 V AC	3RN1012-□BM00	
Holding on supply failure ²⁾ , short-circuits and wire breakage in the sensor circuit are detected and displayed, wide-range voltage with screw terminals with protective separation ¹⁾	Manual/auto/ remote	2 CO	24 V AC/DC	3RN1013-□BB00	
			24–240 V AC/DC	3RN1013-1BW10 3RN1013-2BW00	
		2 CO hard-gold-plated	24–240 V AC/DC	3RN1013-1GW10 3RN1013-2GW00	
			Evaluation units for 2 sensor circuits, alarm and trip, 22.5 mm wide, monostable, closed-circuit current principle, 3 LEDs		
Test/reset button, holding on supply failure ²⁾ ; the evaluation circuit for “alarm” uses an NO contact in the open-circuit principle	Manual/auto/ remote	1 NO + 1 NC	24–240 V AC/DC	3RN1022-□DW00	
Evaluation units for 6 sensor circuits, multi-motor protection, 45 mm wide, monostable, closed-circuit current principle, 8 LEDs					
Test/reset button, holding on supply failure ²⁾	Manual/auto/ remote	1 NO + 1 NC	24–240 V AC/DC	3RN1062-□CW00	
Test/reset button, holding on supply failure ²⁾ , short-circuits and wire breakage in the sensor circuit are detected and displayed, bistable version, not tripped when the control supply voltage fails	Manual/auto/ remote	2 CO	24–240 V AC/DC	3RN1013-□BW01	

1) Protective separation up to 300 V according to DIN/VDE 0106

2) Information regarding the holding on supply failure, refer to Catalog LV 1, chapter 7

3) Reset using the reset button or by interrupting the control supply voltage

Screw Terminal 1

Spring-type Terminal 2

Function Relays, Interfaces and Converters

Thermistor Motor Protection

SIRIUS
RELAYS

3RN1
for PTC temperature sensors

Accessories

Design	for type	Order No.	Weight approx.	Packing
			kg	Packs

Push-in lugs for panel mounting



2 units are necessary per thermistor motor protection.
1 pack contains 10 units for 5 devices.

3RN1

3RP 1903

0.02

1

Technical data

General data

		Compact devices	Standard devices				Multifunct. dev.	Warning + switch-off	Multiple mot. protect.
Type		3RN10 00	3RN10 10	3RN10 11	3RN10 12	3RN10 13	3RN10 22	3RN10 62	
Width	mm	22.5							45
No. of connectable sensor circuits		1					2		6
Response to failure of the control voltage		1)							
Manual RESET		No		Yes					
Automatic RESET		Yes		No	Yes				
Remote RESET		No		Yes ²⁾	Yes				
TEST button		No		Yes					
Short-circuit detection in sensor circuit		No				Yes	No		
Indication of short-circuit and wire-break		No				Yes ³⁾	No		
Warning and switch-off in one unit		No					Yes	No	
Weight	kg	0.120	0.133	0.145	0.145	0.145	0.145	0.260	

Tripping unit

Rated insulation voltage U_i (pollution degree 3)	V	300
Permissible ambient temperature	°C	-25 to +60
Permissible storage temperature		-40 to +80
EMC tests		EN 50 081-2; IEC 61000-6-3
Class acc. to DIN 19 251, DIN V0801		AK 3
Degree of protection acc. to DIN 40 050		IP 20
Conductor cross-section		
Terminal screws		M 3.5 (for standard screwdriver Size 2 and Pozidriv 2)
• Solid	mm ²	1 x (0.5 to 4) / 2 x (0.5 to 2.5)
• Finely stranded with end sleeves	mm ²	1 x (0.5 to 2.5) / 2 x (0.5 to 1.5)
• AWG conductor connections, solid or stranded	AWG	2 x (20 to 14)
• Tightening torque	Nm	0.8 to 1.2
Cage Clamp terminals		
• Solid	mm ²	2 x (0.25 to 1.5)
• Finely stranded with end sleeves	mm ²	2 x (0.25 to 1)
• Finely stranded, without end sleeves	mm ²	2 x (0.25 to 1.5)
• AWG wires, solid or stranded	AWG	2 x (24 to 16)
• Corresponding opening tool		8WA2 803

Sensor circuit

Circuit burden at $R_F \leq 1.5 \text{ k}\Omega$	mW	≤ 5
Voltage in sensor circuit at $R_F \leq 1.5 \text{ k}\Omega$	V	≤ 2
Tripping temperature (specified by sensor)	°C	60 to 180
Coupling time (due to mounting of sensor)	s	approx. 5 s
Total cold resistance R_F (per sensor loop)	k Ω	≤ 1.5
Triggering value	k Ω	3.4 to 3.8
Return value	k Ω	1.5 to 1.65
Triggering tolerance	°C	± 6

1) See page 11/12.

2) Remote RESET due to interruption of the control voltage.

3) Indication of wire-break only for monostable designs (3RN10 13-....0).

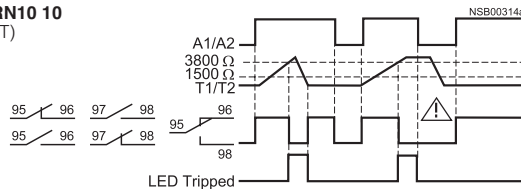
Technical data

		Compact devices	Standard devices			Multi-function devices	Warning + switch-off	Multiple motor protection
Type		3RN10 00	3RN10 10	3RN10 11	3RN10 12	3RN10 13	3RN10 22	3RN10 62
Control circuit								
Rated control supply voltage U_s		1)						
Operating range								
• AC		0.85 to 1.1 x U_s						
• AC/DC		0.85 to 1.1 x U_s						
• DC		0.85 to 1.2 x U_s						
Rated power								
• AC	W	< 2						
• AC/DC	W	< 2						
• DC	W	< 2						
Auxiliary circuit								
Conventional free-air thermal current I_{th}	A	5						
Rated operational current I_e								
• AC-15 240 V	A	3						
• DC-13 24 V	A	1	2			1 ²⁾	1	2
Short-circuit protection acc. to Alpha/Lovag								
Utilisation category gL/gG	A	6						
Ⓢ and Ⓢ ratings, control current circuit								
Rated control voltage 50/60 Hz								
• AC	V	300						
• DC	V	300						
Switching capacity		R 300/B 300						
Safe isolation up to 300 V		–				3RN10 13–1BW10	–	

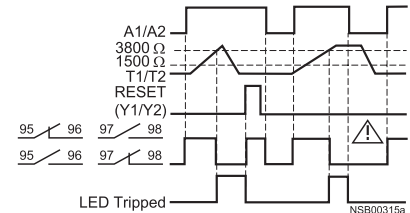
Functions

Function diagrams

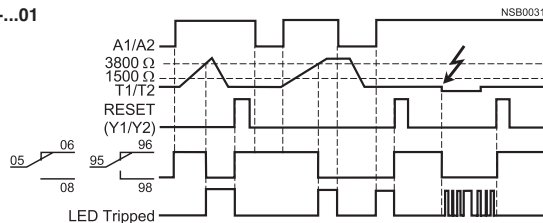
3RN10 00/3RN10 10 (AUTO RESET)



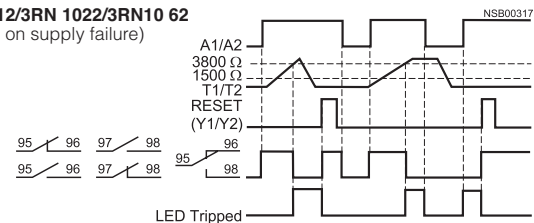
3RN10 11



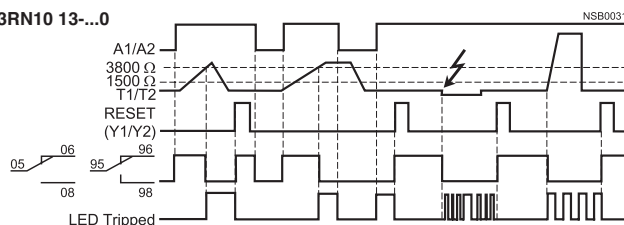
3RN10 13-...01 (bistable)



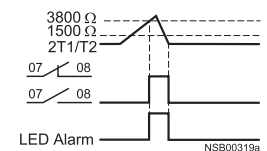
3RN10 12/3RN10 22/3RN10 62 (holding on supply failure)



3RN10 13-...0



3RN10 22 only



1) See selection and ordering data, page 11/13
2) For 3RN10 13-1BW10 (bistable output relay) 2 A.

⚠ See notes on page 11/12.

3RN1 for PTC temperature sensors

Configuration

PTB test report ATEX certification

The tripping units with AC and UC operation are available in conjunction with PTC thermistors acc. to DIN VDE 0660 Parts 302 and 303 and DIN 44 081/DIN 40 082 for direct temperature monitoring of explosion-protected motors of the "Increased safety" EEx e and EEx d degree of protection and are marked with the test symbol. The regulations of DIN EN 50 019, DIN VDE 0170/0171, DIN VDE 0165, the PTB test regulations DIN V 0801 Class = AK 3 and DIN 19251 apply. For tripping units with DC operation¹⁾, electrical isolation must be implemented by means of a battery system or a safety isolating transformer acc. to DIN VDE 0551.

When the 3RN10 13-...01 unit (no change in switching status for the auxiliary contacts on control voltage failure) is used to protect EEx e and EEx d motors, separate monitoring of the control voltage is recommended.

PTB File No. for 3RN1:
PTB 01 ATEX 3218

Cable routing

The measuring circuit cables must be routed as separate control cables. It is not permitted to use cores of the motor supply cable or other main supply cables. If extreme inductive or capacitive interference is expected to be generated by heavy current cables routed in parallel, shielded control cables must be used.

Maximum cable length for sensor circuit:

Cross-section	For tripping units	
	3RN10 00 3RN10 10 3RN10 11 3RN10 12 3RN10 22 3RN10 62	3RN10 13
mm ²	m	m ²
2.5	2 x 2800	2 x 250
1.5	2 x 1500	2 x 150
0.5	2 x 500	2 x 50

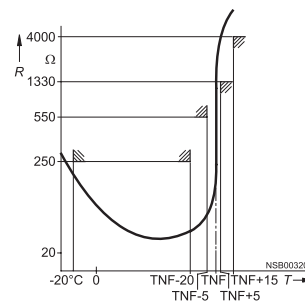
PTC temperature sensor

With the tripping units, temperature sensors with characteristics according to DIN VDE 0660 Part 303, DIN 44 081 and DIN 44 082 (e. g. EPCOS AG single and triple sensors, Type No. B 591... or B 593...) can be used.

The number of temperature sensors that can be connected in series is dependent on the total cold resistance. The total cold resistance must not exceed 1.5 k Ω .

Resistance/temperature characteristic of a PTC thermistor

with a characteristic (Type A) according to DIN VDE 0660 Part 303



Installation

The 3RN1 tripping units are suitable for snapping on to 35 mm standard mounting rails acc. to DIN EN 50 022 or for screw mounting using adapters. Any mounting position is possible.

Specifications

The tripping units are suitable for use in any climate and safe from touch to DIN VDE 0106 Part 100.

The 3RN1 tripping units meet the requirements of the basic technical standard EN 50 081-2; IEC 61000-6-2 "Electromagnetic compatibility of I&C equipment in industrial process engineering" and DIN VDE 0660 Parts 302 and 303, IEC 60 034-11-2 Section 1 and 2 "Built-in thermal protection of rotating electrical machines, thermal detectors and tripping units" and "PTC thermistors and tripping units".

The terminal designations of the auxiliary contacts complies with EN 50 005.

Protecting the windings of three-phase transformers

To protect the windings of three-phase dry transformers with PTC thermistors in cases where the operating voltage of the thermistor motor protection tripping unit must be tapped from the mains voltage, a 3RN10 22 thermistor protection unit for warning and tripping and, for example, a 3RP15 time relay can be used. The auxiliary contactor K4 operates on the shunt release of the high-voltage circuit-breaker.

Working principle for transformer protection

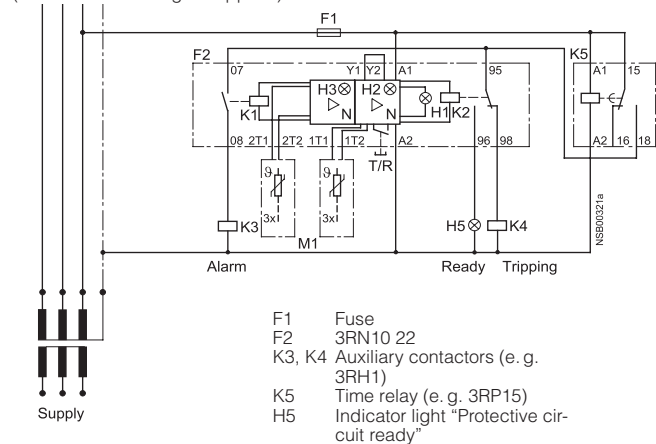
When voltage is applied to the line-side of the transformer, the voltage on the secondary side rises to the final value within 1.5 s. The 3RN1 tripping unit does not trip until $0.8 \times U_N$, so as long as the operating voltage is applied to the closed contacts 95-98 on contactor K4, it would cause breaking of the

circuit-breaker via its shunt release.

In order to prevent this, the voltage is only applied to terminals 07 and 95 once the 3RN1 tripping units have definitely picked up and the auxiliary switches have switched to the "Ready" position. The K3 and K4 contactors are not controlled until the respective rated response temperature TNF of the sensor is exceeded.

The tripping unit should be switched to "Automatic RESET" (jumper must be placed between terminals Y1 and Y2). This ensures that the 3RN1 tripping unit is reset when the transformer is reconnected following tripping. The time-delay relay is set to a delay time of ≥ 1.5 s.

Transformer protection with 3RN10 22 (shown before voltage is applied)



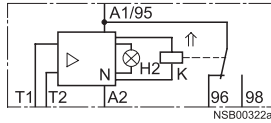
- 1) Electrical isolation exists with devices with a wide input voltage range of 24 to 240 V UC even in the case of DC operation.
- 2) Devices with short-circuit detection in the sensor circuit. Up to this maximum cable length, a short-circuit in the sensor circuit will be detected. When short-circuit detection is not required, the cable lengths shown on the left can be used.

Circuit diagrams

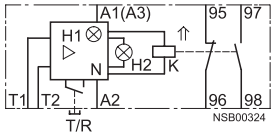
Connection diagrams

Position of the output relay "Ready, not tripped"

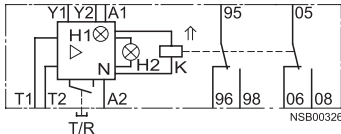
3RN10 00



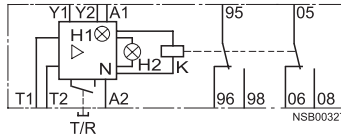
3RN10 11¹⁾



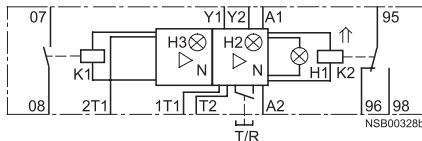
3RN10 13-... 0



3RN10 13-... 1 (bistable)



3RN10 22



3RN10 62



General equipment designations

A1, A2	Control voltage terminals
N	Amplifier
T/R	TEST/RESET button
Y1, Y2	Terminals for remote RESET (jumped = Auto RESET)
↑	The double-headed arrow indicates an operating state of the contact element that deviates from the standard presentation according to DIN 40 900, Part 7 (In this case: Position of the contact elements when the control voltage is applied to terminals A1 and A2)

Equipment designations for 3RN10

H1	LED "READY"
H2	LED "TRIPPED"
K	Output relay
T1, T2	Terminals of the sensor loop

Equipment designations for 3RN10 22

H1	LED "READY"
H2	LED "TRIPPED"
H3	LED "ALARM"
K1, K2	Output relay
1T1 and T2	Terminals of the sensor loop
2T1 and T2	Terminals of the sensor loop



Sensor circuits that are not connected must be short circuited.

Equipment designations for 3RN10 62

H1 to H6	LEDs for tripped sensor loops
H7	LED "READY"
H8	LED "TRIPPED"
K	Output relay
1T1, 1T2 to 6T1, 6T2	Terminals for 1st sensor loop to 6th sensor loop



Sensor circuits that are not connected must be short circuited.

1) For dual voltage devices AC 230 V/110 V (3RN10 11- . CK00 and 3RN10 12- . CK00):
A1 and A2: AC 230 V,
A3 and A2: AC 110 V.

Function Relays, Interfaces and Converters

Thermistor Motor Protection

3RN1 for PTC temperature sensors

SIRIUS RELAYS

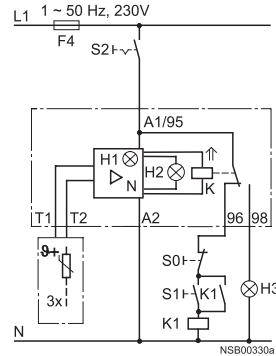
Circuit diagrams

Connection examples

3RN10 00 tripping unit

Switching off a three-phase motor via a contactor, pushbutton control

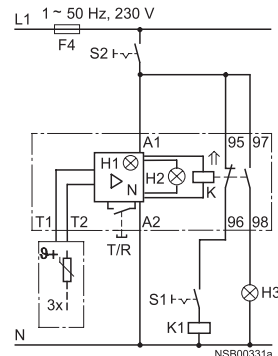
- The contact elements are shown for voltage applied to terminals A1 and A2 of the tripping unit



3RN10 11 tripping unit

Switching off a three-phase motor via a contactor, maintained-contact control

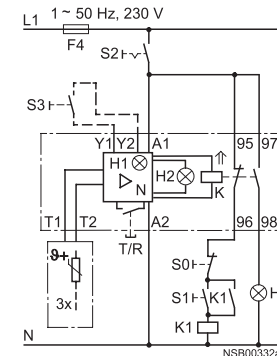
- The contact elements are shown for voltage applied to terminals A1 and A2 of the tripping unit



3RN10 12 tripping unit

Switching off a three-phase motor via a contactor, pushbutton control

- The contact elements are shown for voltage applied to terminals A1 and A2 of the tripping unit



General equipment designations

F4	Control voltage terminals')
N	Back-up fuse
S0	Amplifier
S1	OFF pushbutton
S2	ON pushbutton
S3	Main switch
T/R	Remote RESET button
Y1, Y2	TEST/RESET button
	Terminals for remote RESET (jumped = Auto RESET)
	The double-headed arrow indicates an operating state of the contact element that deviates from the standard presentation according to DIN 40 900, Part 7 (In this case: Position of the contact elements when the control voltage is applied to terminals A1 and A2)

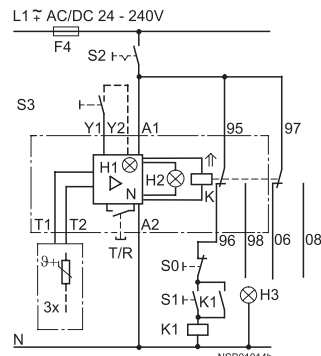
Equipment designations for 3RN10

H1	LED "READY"
H2	LED "TRIPPED"
H3	Signalling light
K	Output relay
K1	Contactor
1T, T2	Terminals of the sensor loop

3RN10 13-...0 tripping unit

Switching off a three-phase motor via a contactor, pushbutton control

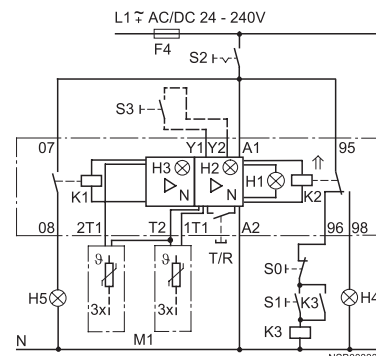
- The contact elements are shown for voltage applied to terminals A1 and A2 of the tripping unit



3RN10 22 tripping unit (warning + switch-off)

Switching off a three-phase motor via a contactor, warning via output relay, pushbutton control

- The contact elements are shown for voltage applied to terminals A1 and A2 of the tripping unit



Equipment designations for 3RN10 22

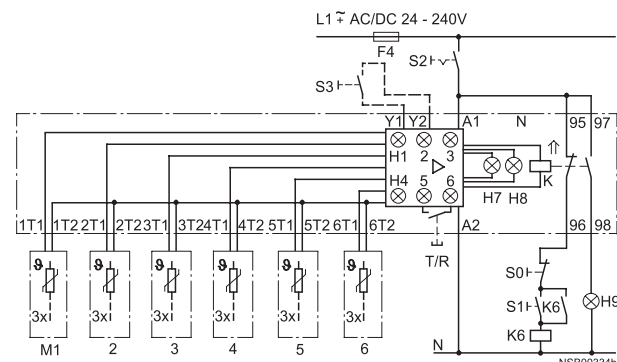
H1	LED "READY"
H2	LED "TRIPPED"
H3	LED "ALARM"
H4	Signalling light
H5	Signalling light "ALARM"
K1, K2	Output relay
K3	Contactor
1T1 and T2	Terminals of the sensor
2T1 and T2	loop

⚠ Sensor circuits that are not connected must be short circuited.

3RN10 62 tripping unit (multiple motor protection)

Switching off 6 three-phase motors via contactors, pushbutton control

- The contact elements are shown for voltage applied to terminals A1 and A2 of the tripping unit



Equipment designations for 3RN10 62

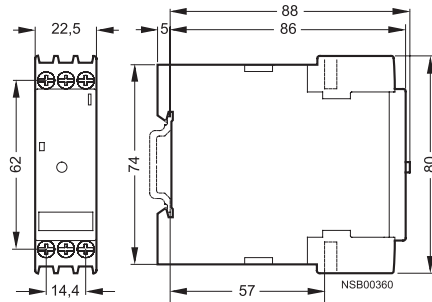
H1 to H6	LEDs for tripped sensor loops
H7	LED "READY"
H8	LED "TRIPPED"
H9	Signalling light
K	Output relay
K6	Contactor
1T1, 1T2	Terminals for 1st sensor loop
6T1, 6T2	Terminals for 6th sensor loop

⚠ Sensor circuits that are not connected must be short circuited.

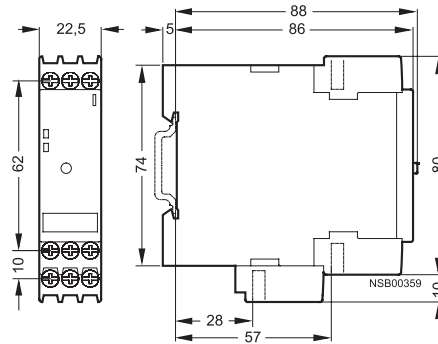
- For dual voltage devices AC 230 V/110 V (3RN10 11-...CK00 and 3RN10 12-...CK00): A1 and A2: AC 230 V, A3 and A2: AC 110 V.

Dimension drawings

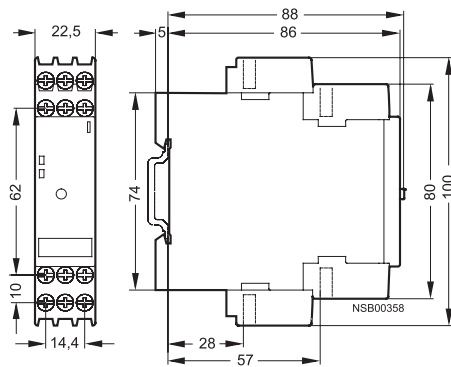
3RN10 00



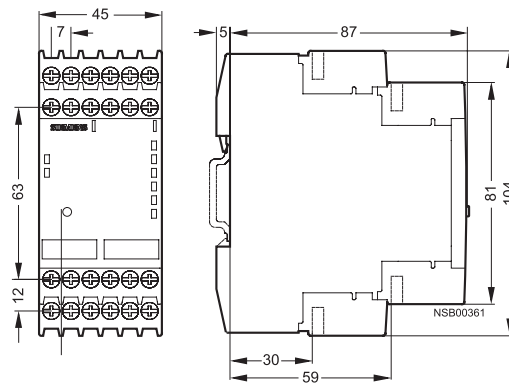
3RN10 10



3RN10 11, 3RN10 12, 3RN10 13, 3RN10 22

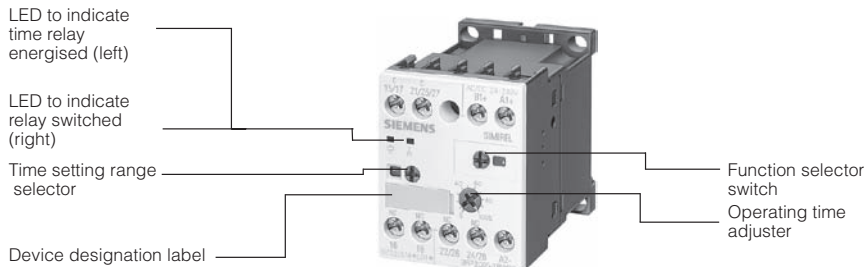


3RN10 62



Overview

3RP20 time relay, assembly width 45 mm



Accessories

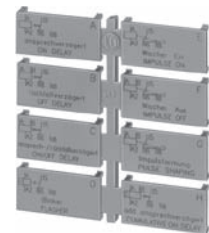
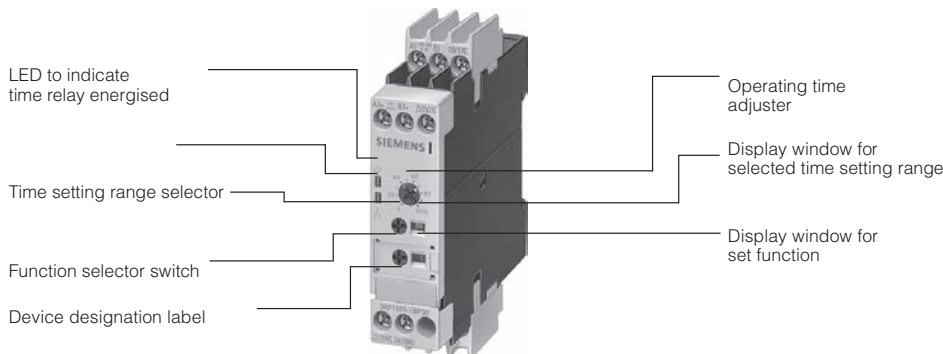
Push-in lugs for screw fixing



Sealable cap



3RP15 time relay, assembly width 22.5 mm



Function

Standards, specifications

- The time relays comply with:
- IEC 60 721-3-3 "Environmental conditions"
 - IEC 61 812-1/DIN VDE 0435 Part 2021 "Electrical relays, time relays"
 - IEC 61 000-6-2/EN 50 081-1 "Electromagnetic capability"
 - IEC 60 947-5-1; DIN VDE 0660 Part 200 "Low-voltage switchgear and controlgear"

They guarantee a high level of functionality and a high repeat accuracy of timer settings.

Housing design

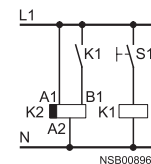
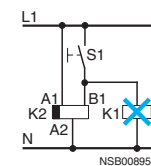
All time relays are suitable for snap-on mounting onto 35 mm standard mounting rails according to EN 50 022 or for screw fixing.

Configuration

- Changing the time setting ranges and the functions will only be effective when being carried out in de-energised state
- Start input B1 or B3 must only be triggered when the supply voltage is applied

- The same potential must be applied to A1 and B1, or A3 and B3. With the two-voltage version, only one voltage range must be connected
- The activation of loads parallel to the start input is not permissible when using AC control voltage (see adjacent diagrams)
- Surge suppression is integrated in the time relay. This prevents supply voltage spikes occurring when the relay switches. No damping mechanisms have been integrated for the contacts
- The 3RP15 05-.R should not be used near heat sources > 60 °C

Parallel load on start input



Application

Time relays are used in control, starting protective and control circuits for all switching operations involving time delays.

3RP1/3RP2 Time relays – electronic 3RP20 Time relays in the SIRIUS design, 45 mm

Function	Contact elements	Time range	Control supply voltage	Order No.	List Price \$
8 functions	1 CO (changeover contact)	0.05 s–100 h	AC/DC 24/100–127 V AC	3RP2005-□AQ30	
8 functions	1 CO	0.05 s–100 h	AC/DC 24/200–240 V AC	3RP2005-□AP30	
On delay	1 CO	0.05 s–100 h	AC/DC 24/100–127 V AC	3RP2025-□AQ30	
On delay	1 CO	0.05 s–100 h	AC/DC 24/200–240 V AC	3RP2025-□AP30	
16 functions	2 CO	0.05 s–100 h	24–240 V AC/DC	3RP2005-□BW30	

3RP1/3RP2 Time relays – electronic 3RP15 Time relays in an industrial housing, 22.5 mm

8 functions	1 CO (changeover contact)	0.05 s–100 h	12 V DC	3RP1505-□AA40	
8 functions	1 CO	0.05 s–100 h	AC/DC 24/100–127 V AC	3RP1505-□AQ30	
8 functions	1 CO	0.05 s–100 h	AC/DC 24/200–240 V AC	3RP1505-□AP30	
8 functions	1 CO	0.05 s–100 h	24–240 V AC/DC	3RP1505-□AW30	
8 functions	2 CO	0.05 s–100 h	24–240 V AC/DC	3RP1505-□RW30 ¹⁾	
16 functions	2 CO	0.05 s–100 h	AC/DC 24/100–127 V AC	3RP1505-□BQ30	
16 functions	2 CO	0.05 s–100 h	AC/DC 24/200–240 V AC	3RP1505-□BP30	
16 functions	2 CO	0.05 s–100 h	24–240 V AC/DC	3RP1505-□BW30	
16 functions	2 CO	0.05 s–100 h	400–440 V AC	3RP1505-1BT20 ²⁾	
On delay	1 CO	0.5–10 s	AC/DC 24/100–127 V AC	3RP1511-□AQ30	
On delay	1 CO	0.5–10 s	AC/DC 24/200–240 V AC	3RP1511-□AP30	
On delay	1 CO	1.5–30 s	AC/DC 24/100–127 V AC	3RP1512-□AQ30	
On delay	1 CO	1.5–30 s	AC/DC 24/200–240 V AC	3RP1512-□AP30	
On delay	1 CO	5–100 s	AC/DC 24/100–127 V AC	3RP1513-□AQ30	
On delay	1 CO	5–100 s	AC/DC 24/200–240 V AC	3RP1513-□AP30	
On delay	1 CO	0.05 s–100 h	AC/DC 24/100–127 V AC	3RP1525-□AQ30	
On delay	1 CO	0.05 s–100 h	AC/DC 24/200–240 V AC	3RP1525-□AP30	
On delay	2 CO	0.05 s–100 h	42–48/60 V AC/DC	3RP1525-□BR30	
On delay	2 CO	0.05 s–100 h	AC/DC 24/100–127 V AC	3RP1525-□BQ30	
On delay	2 CO	0.05 s–100 h	AC/DC 24/200–240 V AC	3RP1525-□BP30	
On delay	2 CO	0.05 s–100 h	24–240 V AC/DC	3RP1525-□BW30	
On delay, 2-wire	1 NO contact, solid-state	0.05–240 s	24–66 V AC/DC	3RP1527-□EC30	
On delay, 2-wire	1 NO contact, solid-state	0.05–240 s	90–240 V AC/DC	3RP1527-□EM30	
Off delay with auxiliary voltage	1 CO	0.5–10 s	AC/DC 24/100–127 V AC	3RP1531-□AQ30	
Off delay with auxiliary voltage	1 CO	0.5–10 s	AC/DC 24/200–240 V AC	3RP1531-□AP30	
Off delay with auxiliary voltage	1 CO	1.5–30 s	AC/DC 24/100–127 V AC	3RP1532-□AQ30	
Off delay with auxiliary voltage	1 CO	1.5–30 s	AC/DC 24/200–240 V AC	3RP1532-□AP30	
Off delay with auxiliary voltage	1 CO	5–100 s	AC/DC 24/100–127 V AC	3RP1533-□AQ30	
Off delay with auxiliary voltage	1 CO	5–100 s	AC/DC 24/200–240 V AC	3RP1533-□AP30	
Off delay without auxiliary voltage	1 CO	0.05–600 s	24 V AC/DC	3RP1540-□AB31	
Off delay without auxiliary voltage	1 CO	0.05–600 s	100–127 V AC/DC	3RP1540-□AJ31	
Off delay without auxiliary voltage	1 CO	0.05–600 s	200–240 V AC/DC	3RP1540-□AN31	
Off delay without auxiliary voltage	1 CO	0.05–600 s	24–240 V AC/DC	3RP1540-□AW31	
Off delay without auxiliary voltage	2 CO	0.05–600 s	24 V AC/DC	3RP1540-□BB31	
Off delay without auxiliary voltage	2 CO	0.05–600 s	100–127 V AC/DC	3RP1540-□BJ31	
Off delay without auxiliary voltage	2 CO	0.05–600 s	200–240 V AC/DC	3RP1540-□BN31	
Off delay without auxiliary voltage	2 CO	0.05–600 s	24–240 V AC/DC	3RP1540-□BW31	
Clock-pulse relay	1 CO	0.05 s–100 h	42–48/60 V AC/DC	3RP1555-□AR30	
Clock-pulse relay	1 CO	0.05 s–100 h	AC/DC 24/100–127 V AC	3RP1555-□AQ30	
Clock-pulse relay	1 CO	0.05 s–100 h	AC/DC 24/200–240 V AC	3RP1555-□AP30	
Star/delta with run-on function	3 x 1 NO contact	1–20 s, 30–600 s (run-on)	AC/DC 24/100–127 V AC	3RP1560-□SQ30	
Star/delta with run-on function	3 x 1 NO contact	1–20 s, 30–600 s (run-on)	AC/DC 24/200–240 V AC	3RP1560-□SP30	
Star/delta	1 NO contact + 1 NO contact	1–20 s	AC/DC 24/100–127 V AC	3RP1574-□NQ30	
Star/delta	1 NO contact + 1 NO contact	1–20 s	AC/DC 24/200–240 V AC	3RP1574-□NP30	
Star/delta	1 NO contact + 1 NO contact	3–60 s	AC/DC 24/100–127 V AC	3RP1576-□NQ30	
Star/delta	1 NO contact + 1 NO contact	3–60 s	AC/DC 24/200–240 V AC	3RP1576-□NP30	

1) Positively-driven and hard-gold-plated relay contacts

2) This device is only available with screw terminals

Screw Terminal **1**
Spring-type Terminal **2**

Technical data acc. to IEC 61 812-1/DIN VDE 0435 Part 2021

Type			3RP20 05 3RP20 25	3RP15 05 3RP15 31 3RP15 32 3RP15 33	3RP15 12 3RP15 13 3RP15 25 3RP15 55	3RP15 40	3RP15 60	3RP15 74 3RP15 76	3RP15 27
Rated insulation voltage Pollution degree 3 Overvoltage category III acc. to DIN VDE 0110	AC V	300; 500 for 3RP15 05-1BT20							
Working range of excitation ¹⁾		0.85 to 1.1 x U_s for AC; 0.8 to 1.25 x U_s for DC 0.95 to 1.05 x rated frequency							
Rated power Power consumption at 230 V AC, 50 Hz	W VA	1 4	2 6	2 6	2 2 ²⁾	2 6	2 6	1 1	
Rated operational current I_e AC-15 at AC 230 V, 50 Hz AC-14; DC-13 DC-13 at 24 V DC-13 at 48 V DC-13 at 60 V DC-13 at 110 V DC-13 at 230 V	A	3 ³⁾ – 1 0.45 0.35 0.2 0.1							– 0.01 to 0.6 – – – – –
Required DIAZED fuse ⁴⁾ Utilisation category	gL/gG A	4							–
Operating frequency • when loaded with I_e AC 230 V • when loaded with 3RT10 16 contactor, AC 230 V	1/h 1/h	2500 5000							5000 5000
Recovery time	ms	150 ⁵⁾					300	150	50
Minimum ON period	ms	35	35 ⁶⁾	–	200 ⁷⁾	–			
Off-state current with non-conducting output	mA								≤ 5
Voltage drop with conducting output	V								≤ 3.5
Short-time loading capacity	A								10 (up to 10 ms)
Setting accuracy referred to upper limit of scale		typical ± 5 %							
Repeat accuracy		≤ v ± 1 %							
Mechanical endurance operating cycles		30 x 10 ⁶							100 x 10 ⁶
Permissible ambient temperature in operation when stored	°C °C	–25 to +60 –40 to +85							
Degree of protection acc. to EN 60 529		cover IP 40 terminals IP 20							
Conductor cross-sections	Main conductors, auxiliary conductors								
• Screw connection (to connect 1 or 2 conductors for standard screwdriver size 2 and Pozidriv 2)	solid	mm ²	2 x (0.5 to 1.5) 2 x (0.75 to 4)	1 x (0.5 ... 4) 2 x (0.5 ... 2.5)					
	finely stranded with end sleeve	mm ²	2 x (0.5 to 2.5)	1 x (0.5 ... 2.5) 2 x (0.5 ... 1.5)					
	solid or stranded AWG conductors	AWG	2 x (18 to 14)	2 x (20 ... 14)					
	terminal screw	M 3	M 3.5						
	tightening torque	Nm	0.8 to 1.2						
• Cage Clamp connection (1 or 2 wire connection; for 22.5 mm time-delay relay use screwdriver with blade width 3 mm or 8WA2 803 opening tool	solid	mm ²	2 x (0.25 to 2.5)	2 x (0.25 ... 1.5)					
	finely stranded								
	• with end sleeve	mm ²	2 x (0.25 to 1)	2 x (0.25 ... 1)					
	• without end sleeve	mm ²	2 x (0.25to1.5)	2 x (0.25 ... 1.5)					
	solid or stranded AWG conductors	AWG	2 x (24 to 14)	2 x (24 ... 16)					

1) If nothing else is stated.

2) Maximum inrush current 1 A/100 ms.

3) For 3RP15 05-.R: NC contact → $I_e = 1$ A

4) Without any welds acc. to IEC 60 947-5-1.

5) With 3RP15 05-.BW30/.AW30/.RW30 and 3RP15 25-.BW30, 10 to 250 ms, voltage-dependent.

6) Minimum ON period with 3RP15 00-.BW30, 150 ms until instantaneous contact has switched.

7) For correct operation, observe minimum ON period.

Technical data acc. to IEC 61 812-1/DIN VDE 0435 Part 2021

Type		3RP20 05 3RP20 25	3RP15 05 3RP15 31 3RP15 32 3RP15 33	3RP15 11 3RP15 12 3RP15 13 3RP15 25 3RP15 55	3RP15 40	3RP15 60	3RP15 74 3RP15 76	3RP15 27
Permissible mounting position		any						
Shock resistance Half sine acc. to IEC 60 068-2-27	g/ms	15/11						
Vibration performance acc. to IEC 60 068-2-6	Hz/mm	10-55 / 0.35						
EMC tests acc. to basic specification		IEC 61 000-6-2 / EN 50 081-1						

Type			7PV33 48	7PV41 48	7PV43 48
Rated insulation voltage Overvoltage category C acc. to DIN VDE 0110		AC V	250		
Working range of excitation			+ 10 ... – 15 %	24 V: – 15 ... + 30 % 115/230 V: – 15 ... + 10 %	
Rated power Power consumption at AC 230 V, 50 Hz		W VA	1 11		
Rated operational current I_o AC-1 at AC 230 V, 50 Hz		A	8		
Operating frequency • when loaded with I_o , AC 230 V • when loaded with 3RT10 16 contactor, AC 230 V		1/h 1/h	600		
Recovery time		ms	50	100	
Minimum ON period		ms	50	100	
Setting accuracy with reference to upper limit of scale			± 0.03 %, ± 10 ms	± 10 %	
Repeat accuracy			± 0.03 %, ± 10 ms	± 2 %	
Mechanical endurance	operating cycles		5 x 10 ⁶	2 x 10 ⁷	
Permissible ambient temperature	in operation when stored	°C °C	– 10 ... +60 – 30 ... +70	– 20 ... +60 – 25 ... +70	
Degree of protection acc. to EN 60 529			IP 65	IP 50	
Permissible mounting position			any		

Functions

Function table

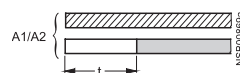
Function	Function diagram	3RP20 time relays and 7PX9 coding plug	3RP15 time relays and 3RP15 19 label set									
		3RP20 05 7PX9 904	3RP20 25	3RP15 05--A 3RP19 01-0A	Code letter	3RP15 1.	3RP15 25	3RP15 27	3RP15 3.	3RP15 40	3RP15 55	3RP15 7.

1 changeover contact

ON-delay		■	■	■	A	■	■					
OFF-delay with auxiliary voltage		■		■	B ¹⁾				■			
OFF-delay without auxiliary voltage										■		
ON-delay and OFF-delay with auxiliary voltage ($t = t_{on} = t_{off}$)		■		■	C ¹⁾							
flashing, starting with interval (pulse/interval 1:1)		■		■	D							
clock-pulse, starting with interval (dead interval, pulse time and time setting ranges each separately adjustable)											■	
passing make contact		■		■	E							
passing break contact with auxiliary voltage		■		■	F ¹⁾							
passing make contact and passing break contact												
pulse shaping with auxiliary voltage (pulse generation at the output does not depend on duration of energising)		■		■	G ¹⁾							
additive ON-delay with auxiliary voltage		■		■	H ¹⁾							

1 normally open contact (semiconductor)

ON-delay: The two-wire time relay is connected in series with the load. Timing begins after application of the exciting voltage. The semiconductor output then becomes conducting, and the load is energised.



1) Note on function with start contact: Another control signal at terminal B after the operating time has started resets the operating time to zero. This does not apply to "G", "G•" and "H", "H•", that cannot be retriggered.

Functions

Function table


Function	Function diagram	3RP20 time relays and 7PX9 cod- ing plug	3RP15 time relays and 3RP19 label set												
	<div><div></div>time relay energised</div> <div><div></div>contact closed</div> <div><div></div>contact open</div>	3RP20 05-B 7PX9 904	3RP20 25	3RP15 05-B 3RP19 01-0B	3RP15 05-R 3RP19 01-0A	Code letter	3RP15 1.	3RP15 25	3RP15 27	3RP15 3.	3RP15 40	3RP15 55	3RP15 60	3RP15 7.	
2 changeover contacts															
ON-delay	<div>A1/A2<div></div></div> <div>15/18<div></div></div> <div>15/16<div></div></div> <div>25/28<div></div></div> <div>25/26<div></div></div> 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1) Note on function with start contact: another control signal at terminal B after the operating time has started resets the operating time to zero. This does not apply to G, **G●** and H, **H●**, that cannot be retriggered.

Overview

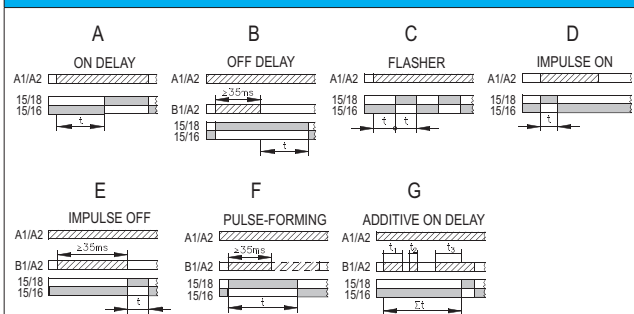
- Wide voltage range 12 ... 240 V AC/DC
- High switching capacity, e.g. AC15 at 230 V, 3 A
- Combination voltage, e.g. 24 V AC/DC and 200 ... 240 V AC
- Changes to the time setting range during operation
- Changes to the function in the de-energized state
- High level of functionality and a high repeat accuracy of timer settings
- Integrated surge suppressor
- Function charts printed on the side of the device for reliable device adjustment

7PV15 electronic timing relays in 17.5 mm enclosure

	Function	Time setting range	Rated control voltage U _s	Contacts *	Order No.
	Multifunction timing relays				
	7 functions	0.05 sec–100 h	12–240 V AC/DC	1 CO	7PV1508-1AW30
	ON delay timing relays				
	ON delay	0.5 sec–10 sec	AC/DC 24 AC 100–127 V	1 CO	7PV1512-1AQ30
	ON delay	0.5 sec–10 sec	AC/DC 24 AC 200–240 V	1 CO	7PV1512-1AP30
	ON delay	5 sec–100 sec	AC/DC 24 AC 100–127 V	1 CO	7PV1513-1AQ30
	ON delay	5 sec–100 sec	AC/DC 24 AC 200–240 V	1 CO	7PV1513-1AP30
	ON delay	0.05 sec–100 h	12–240 V AC/DC	1 CO	7PV1518-1AW30
	ON delay	0.05 sec–100 h	90-127V AC/DC	1 CO	7PV1518-1AJ30
	ON delay	0.05 sec–100 h	180-240V AC/DC	1 CO	7PV1518-1AN30
	OFF delay timing relays				
	OFF delay with auxiliary voltage	0.05 sec–100 h	12–240 V AC/DC	1 CO	7PV1538-1AW30
	OFF delay without auxiliary voltage	0.05 sec–100 sec	12–240 V AC/DC	1 CO	7PV1540-1AW30
	Clock generator				
	Clock generator	0.05 sec–100 h	12–240 V AC/DC	1 CO	7PV1558-1AW30
	Star-delta timing relays				
	Star-delta	0.05 sec–100 h	12–240 V AC/DC	2 CO	7PV1578-1BW30

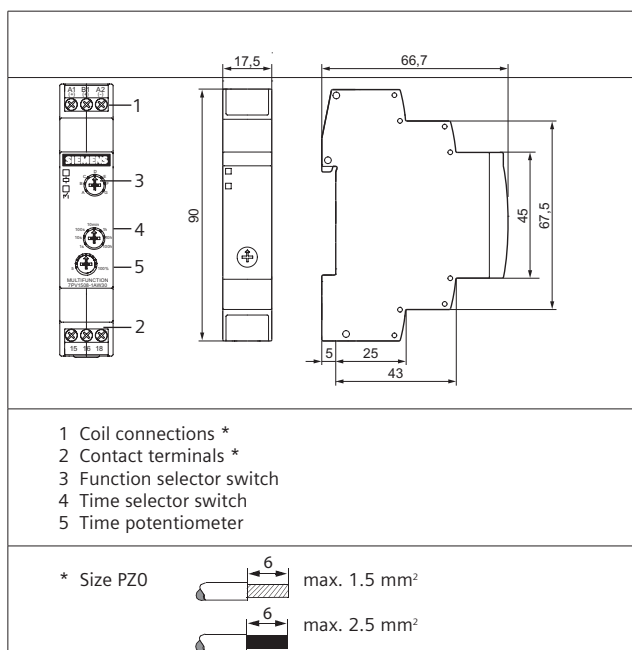
* CO - changeover contact

Multifunction timing relays with 7 functions



- A ON delay
- B OFF delay with auxiliary voltage
- C flashing, starting with interval
- D passing make contact function
- E passing break contact function with auxiliary voltage
- F pulse-forming with auxiliary voltage
- G additve ON delay with auxiliary voltage

OFF delay without auxiliary voltage	Clock generator	Star-delta
7PV1540-1AW30	7PV1558-1AW30	7PV1578-1BW30
<p>OFF DELAY</p>	<p>CLOCK PULSE</p>	<p>STAR/DELTA</p>



Function Relays, Interfaces and Converters

Solid-State Time Relays

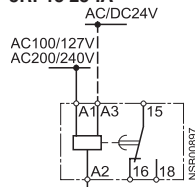
3RP20/3RP15/7PV

SIRIUS
RELAYS

Circuit diagrams

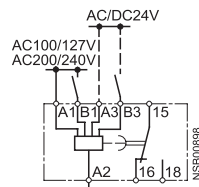
Device circuit diagrams (terminal designations acc. to DIN 46 199, Part 5)

3RP20 05
3RP20 25
3RP15 05-A
3RP151.
3RP15 25-A



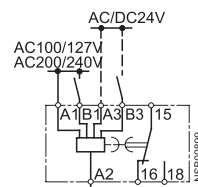
ON-delay

3RP20 05
3RP15 05-A
3RP15 3-A



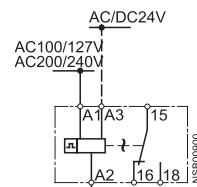
OFF-delay
with auxiliary voltage

3RP20 05
3RP15 05-A



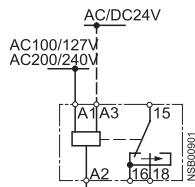
ON-delay and OFF-delay
with auxiliary voltage

3RP20 05
3RP15 05-A



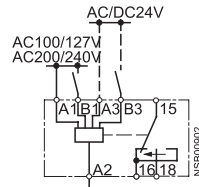
Flashing

3RP20 05
3RP15 05-A



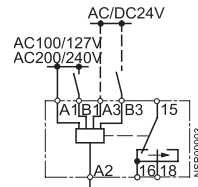
Passing make contact

3RP20 05
3RP15 05-A



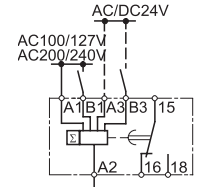
Passing break contact
with auxiliary voltage

3RP20 05
3RP15 05-A



Pulse shaping
with auxiliary voltage

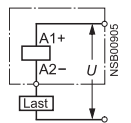
3RP15 05-A



Additive ON-delay
with auxiliary voltage

3RP15 27

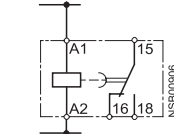
$U = \text{AC/DC } 24-66 \text{ V}$
 $\text{AC/DC } 90-240 \text{ V}$



ON-delay,
two-wire version

3RP15 40-A

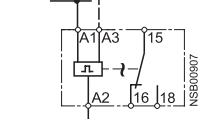
$\text{AC/DC } 24 \text{ V}$
 $\text{AC/DC } 100/127 \text{ V}$
 $\text{AC/DC } 200/240 \text{ V}$



OFF-delay
without auxiliary voltage

3RP15 55

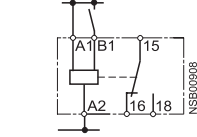
$\text{AC/DC } 24 \text{ V}$
 $\text{AC/DC } 42 \text{ V} \dots 48 \text{ V}$
 $\text{AC/DC } 60 \text{ V}$
 $\text{AC } 100/127 \text{ V}$
 $\text{AC } 200/240 \text{ V}$



Clock-pulse relay

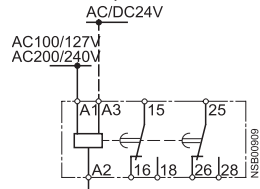
3RP15 05-AW30

$\text{AC/DC } 24 \dots 240 \text{ V}$



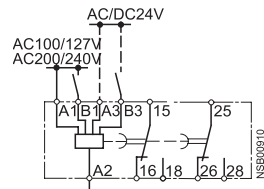
Multifunction relay
(functions as for 3RP15 05-1A)

3RP15 05-B, 3RP15 25-1B



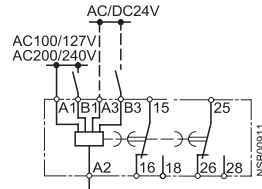
ON-delay, 3RP15 25-1B,
also for 42 to 48/60 V AC/DC
(see page 11/31 3RP15 25-1BR30)

3RP15 05-B



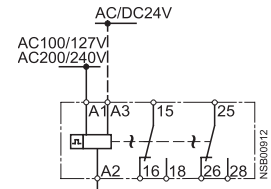
OFF-delay with auxiliary voltage

3RP15 05-B



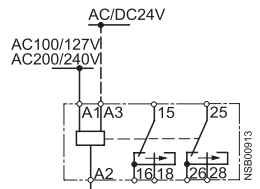
ON-delay and OFF-delay
with auxiliary voltage

3RP15 05-B



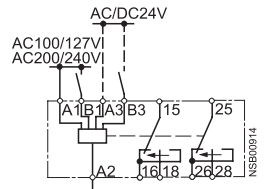
Flashing

3RP15 05-B



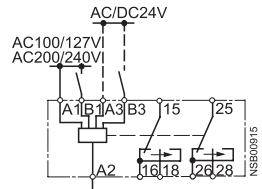
Passing make contact

3RP15 05-B



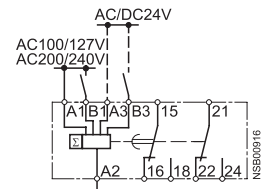
Passing break contact
with auxiliary voltage

3RP15 05-B



Pulse shaping with auxiliary voltage

3RP15 05-B

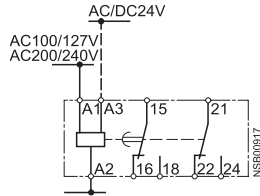


Additive ON-delay
with auxiliary voltage
and instantaneous contact

Circuit diagrams

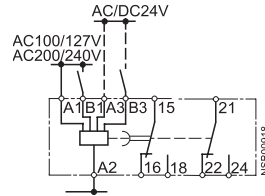
Device circuit diagrams (terminal designations acc. to DIN 46 199, Part 5)

3RP15 05-B



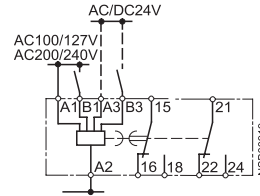
ON-delay
and instantaneous contact

3RP15 05-B



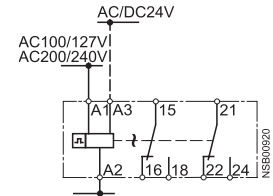
OFF-delay
with auxiliary voltage
and instantaneous contact

3RP15 05-B



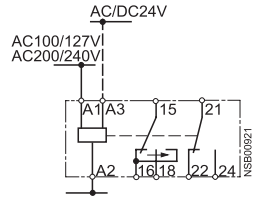
ON-delay and OFF-delay with auxiliary
voltage and instantaneous contact

3RP15 05-B



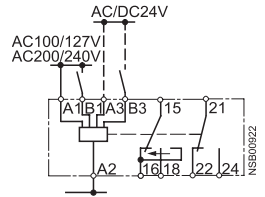
Flashing
and instantaneous contact

3RP15 05-B



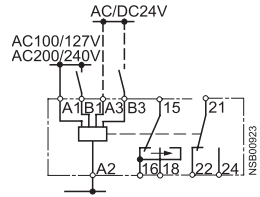
Passing make contact
and instantaneous contact

3RP15 05-B



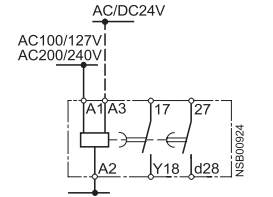
Passing break contact with auxiliary
voltage and instantaneous contact

3RP15 05-B



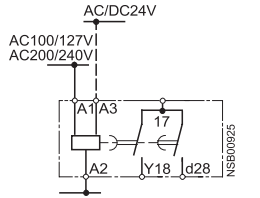
Pulse shaping with auxiliary voltage
and instantaneous contact

3RP15 05-B



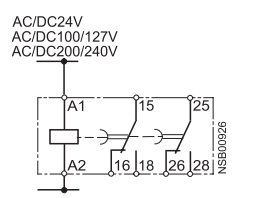
Star-delta function

3RP15 74, 3RP15 76



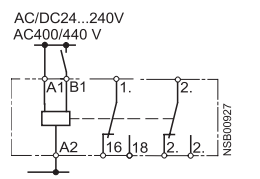
star delta time relay

3RP15 40-B



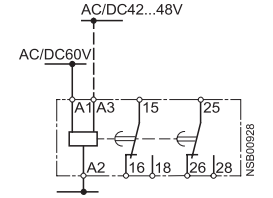
OFF-delay
without auxiliary voltage

3RP15 05-BW30 / -1BT20 / -RW30 3R920 05-B



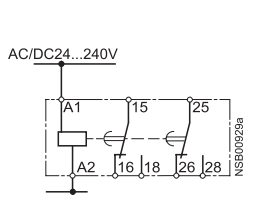
Multifunction relay
(for functions see function table)

3RP15 25-BR30



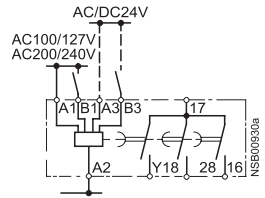
ON-delay

3RP15 25-BW30



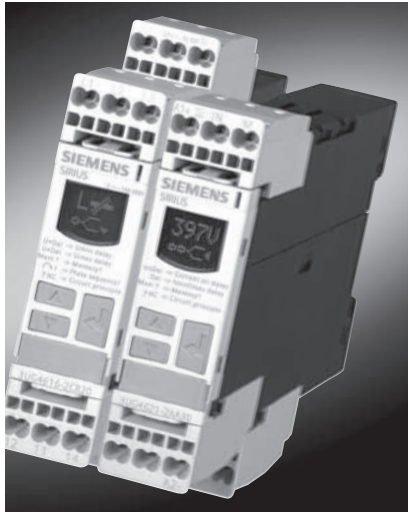
ON-delay

3RP15 60-S



Star delta time relay
with overtravel function (idling)

The new 3UG4 line monitoring relays permit a maximum degree of protection to be achieved for machines, plants and systems. This means that line and voltage faults can be detected early on and the appropriate response is initiated before far more significant subsequent damage can occur.



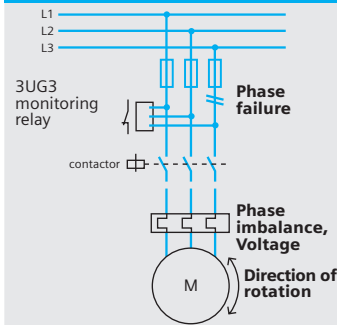
Your advantages:

- Thanks to the wide voltage range, it can be used on all line supplies around the world – from 160 V to 690 V – without an auxiliary voltage
- Can be variably set to above range, below range or window monitoring
- Freely parameterizable delay times and reset behavior
- Reduced width for all versions for line and voltage monitoring
- For the digital versions, the actual value and fault type are permanently displayed
- Automatic direction of rotation correction by differentiating between line faults and incorrect phase sequence
- All versions have removable terminals
- All versions have either screw terminals or alternatively innovative Cage Clamp terminals

Applications:

The applications are listed in the following table. These tables indicate the various plant system conditions that can be detected using the monitoring parameters.

Configuration of a 3-phase monitoring function



Measured quantity	Possible plant or system fault
Phase sequence	<ul style="list-style-type: none"> • Direction of rotation of the drive
Phase failure	<ul style="list-style-type: none"> • A fuse has blown • Control supply voltage has failed • Single-phase operation of a motor with the corresponding overheating
Phase dissymmetry	<ul style="list-style-type: none"> • Motor overheating as a result of non-symmetrical voltages or phase failure • Line supplies with non-symmetrical load are detected • A phase failure is detected in spite of regenerative feedback
Undervoltage	<ul style="list-style-type: none"> • Motor draws an increased current and in turn overheats • A device is undesirably reset • Line supply dips, especially when supplied from a battery • Threshold value switch for analog signals 0 to 10 V
Overvoltage	<ul style="list-style-type: none"> • A plant is protected against destruction due to supply overvoltages • A plant or system switches-in above a certain voltage • Threshold value switch for analog signals 0 to 10 V
Insulation monitoring	<ul style="list-style-type: none"> • The insulation resistance for non-grounded plants and systems is monitored

3UG4 Monitoring relays for the line supply and three-phase voltages

Phase sequence	Phase failure	Phase imbalance	Hysteresis	Under-voltage	Over-voltage	N-conductor monitoring	Delay time	Contacts	Line supply voltage	Order No.	List Price \$
22.5 mm wide 3UG4514 to 3UG3518 can be digitally set, with fault memory and with LCD display											
Yes	–	–	–	–	–	–	–	1 CO	160–260 320–500 420–690	3UG4511-□AN20 3UG4511-□AP20 3UG4511-□AQ20	
								2 CO	160–260 320–500 420–690	3UG4511-□BN20 3UG4511-□BP20 3UG4511-□BQ20	
Yes	Yes	10%	–	–	–	–	–	1 CO	160–690	3UG4512-□AR20	
								2 CO	160–690	3UG4512-□BR20	
Yes	Yes	20%	5%	160–690 V	–	–	Off delay 0–20 s	2 CO	160–690	3UG4513-□BR20	
Selectable	Yes	0–20%	1–20 V	160–690 V	–	–	On and off delay 0–20 s	2 CO	160–690	3UG4614-□BR20	
Selectable	Yes	Using threshold values	1–20 V	160–690 V	160–690 V	–	0–20 s for V_{\min} and V_{\max}	1 CO for V_{\min} and V_{\max}	160–690	3UG4615-□CR20	
Selectable	Yes	Using threshold values	1–20 V	160–690 V	160–690 V (90–400 w.r.t. N)	Yes	0–20 s for V_{\min} and V_{\max}	1 CO for V_{\min} and V_{\max}	160–690 (90–400 w.r.t. N)	3UG4616-□CR20	
Autom. correction	Yes	0–20%	1–20 V	160–690 V	160–690 V	–	Off delay 0–20 s	1 CO for line faults and 1 W for phase sequence	160–690	3UG4617-□CR20	
Autom. correction	Yes	0–20%	1–20 V	160–690 V	160–690 V (90–400 w.r.t. N)	Yes	Off delay 0–20 s	1 CO for line faults and 1 W for phase sequence	160–690 (90–400 w.r.t. N)	3UG4618-□CR20	

Screw Terminal 1

Spring-type Terminal 2

Return voltage due to coupling between the individual phases

Loads connected to the three-phase line supply – such as motor windings, lamps, transformers – result in a coupling between the individual phases.

As a result of this coupling, there is always a return voltage at the equipment terminal of the phase that has failed.

Single-phase voltage monitoring

Measuring range	Hysteresis	Contacts	Delay time	Auxiliary voltage	Order No.	List Price \$
22.5 mm wide, all of the devices can be digitally set and have an LCD display, a fault memory that can be switched-in, simultaneous monitoring for overvoltage and undervoltage over the complete measuring range						
17–275 V AC DC	0.1–150 V	1 CO	0–20 s	Selfsupplied	3UG4633-□AL30	
0.1–60 V AC DC	0.1–30 V	1 CO	0–20 s	24 V AC DC	3UG4631-□AA30	
				24–240 V AC DC	3UG4631-□AW30	
10–600 V AC DC	0.1–300 V	1 CO	0–20 s	24 V AC DC	3UG4632-□AA30	
				24–240 V AC DC	3UG4632-□AW30	

Screw Terminal 1

Spring-type Terminal 2



Function Relays, Interfaces and Converters

3UG Monitoring Relays

SIRIUS
RELAYS

Line monitoring

Technical specifications

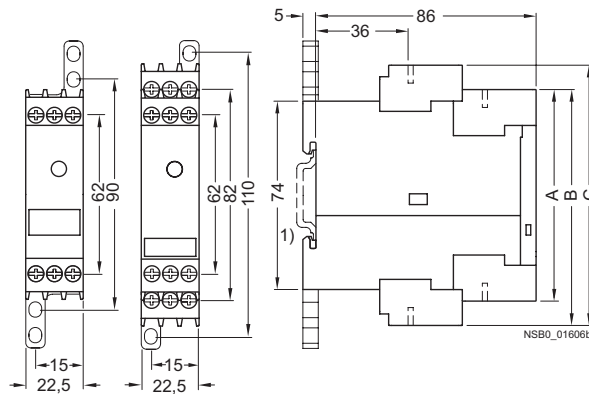
Type		3UG45 11- ..N20	3UG45 11- ..P20	3UG45 11- ..Q20	3UG45 12	3UG45 13	3UG46 14	3UG46 15 3UG46 17	3UG46 16 3UG46 18
General data									
Rated control supply voltage U_s ¹⁾	V	160 ... 260	320 ... 500	420 ... 690	160 ... 690				90 ... 400
Rated frequency	Hz	50/60							
Rated power, typical									
• At AC 230 V	W/VA	2/4	--	--	2/2.5				
• At AC 400 V	W/VA	--	2/8	--	2/3.5				
• At AC 460 V	W/VA	--	--	2/8	2/4				
Width	mm	22.5							
RESET		Auto-RESET					Automatic/manual		
Principle of operation		Closed-circuit					Closed-circuit, open-circuit (3UG46 17/3UG46 18: closed-circuit)		
Availability time after application of U_s	ms	200			1.000				
Response time once a switching threshold is reached	ms	Max. 450							
Unbalance	%	--			10	20	0; 5 ... 20	3UG46 15/3UG46 16: Through threshold values 3UG46 17/3UG46 18: 0; 5 ... 20	
Adjustable tripping delay time	s	--				0.1 ... 20			
Adjustable ON-delay time	s	--					0.1 ... 20	--	
Mains buffering time, minimum	ms	10			30				
Rated insulation voltage U_i Degree of pollution 3 Overvoltage category III acc. to EN 60664-1	V	690							
Rated impulse withstand voltage	kV	6							
Permissible ambient temperature									
• During operation	°C	-25 ... +60							
• During storage	°C	-40 ... +85							
EMC tests ²⁾		IEC 60947-/IEC 61000-6-2/IEC 61000-6-4							
Degree of protection									
• Enclosure		IP40							
• Terminals		IP20							
Vibration resistance acc. to IEC 60068-2-6		1 ... 6 Hz: 15 mm; 6 ... 500 Hz: 2 g							
Shock resistance acc. to IEC 60068-2-27		12 shocks (half-sine 15 g/11 ms)							
Connection type		 Screw terminals							
• Terminal screw		M 3 (standard screwdriver, size 2 and Pozidriv 2)							
• Solid	mm ²	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)							
• Finely stranded with end sleeve	mm ²	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5)							
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)							
• Tightening torque	Nm	0.8 ... 1.2							
Connection type		 Spring-type terminals							
• Solid	mm ²	2 x (0.25 ... 1.5)							
• Finely stranded, with end sleeves acc. to DIN 46228	mm ²	2 x (0.25 ... 1.5)							
• Finely stranded	mm ²	2 x (0.25 ... 1.5)							
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)							
Measuring circuit									
Measuring range AC 50/60 Hz rms value	V	160 ... 260	320 ... 500	420 ... 690	160 ... 690				
Setting range	V					200...690	160...690		90...400
Measuring accuracy	%	--				±5			
Repeat accuracy At constant parameters	%	--				±1			
Setting accuracy		--				±10 % referred to setting	±1 V		
Accuracy of digital display		--					±1 digit		
Deviations for temperature fluctuations	%/°C	--				±0.1			
Hysteresis for voltage	V	--				5 % from setting	1 ... 20 V		
Hysteresis for unbalance	%	--					(setting - 2)	3UG46 17/3UG46 18: (setting - 2)	
Deviation for frequency fluctuation	%	--				±1			

¹⁾ Absolute limit values.

²⁾ Important: This is a Class A product. In the household environment this device may cause radio interference. In this case the user must introduce suitable measures.

		3UG45 11- ..N20	3UG45 11- ..P20	3UG45 11- ..Q20	3UG45 12	3UG45 13	3UG46 14	3UG46 15 3UG46 17	3UG46 16 3UG46 18
Control circuit									
Load capacity of the output relay									
• Conventional thermal current I_{th}	A	5							
Rated operational current I_e at									
• AC-15/24 ... 400 V	A	3							
• DC-13/24 V	A	1							
• DC-13/125 V	A	0.2							
• DC-13/250 V	A	0.1							
Minimum contact load at 17 V DC	mA	5							
Output relay with DIAZED fuse	A	4							
gL/gG operational class									
Electrical endurance AC-15	Million operating cycles	0.1							
Mechanical endurance	Million operating cycles	10							

Dimensional drawings



Type	3UG45 11-A 3UG45 12-A	3UG45 11-B 3UG45 12-B 3UG45 13 3UG46 14 3UG46 15 3UG46 17	3UG46 16 3UG46 18
	A	B	C

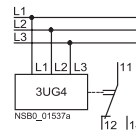
Removable terminal

Screw-type terminal	83	92	102
Spring-loaded terminal	84	94	103

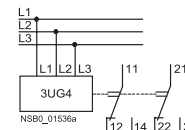
1) For standard mounting rail according to EN 60715.

Schematics

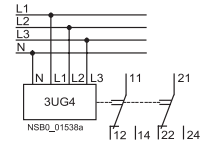
3UG45 11-A
3UG45 12-A



3UG45 11-B
3UG45 12-B
3UG45 13
3UG46 14
3UG46 15
3UG46 17



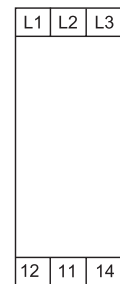
3UG46 16
3UG46 18



Note: It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

Position of the terminals

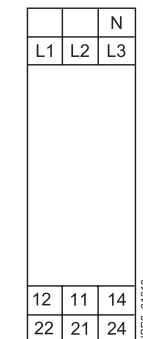
3UG45 11-A
3UG45 12-A





3UG45 11-B
3UG45 12-B
3UG45 13
3UG46 14
3UG46 15
3UG46 17



3UG46 16
3UG46 18



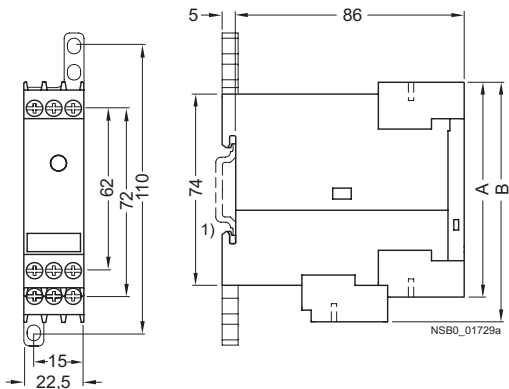
Technical specifications

		3UG46 31- .AA	3UG46 31- .AW	3UG46 32- .AA	3UG46 32- .AW	3UG46 33
General data						
Rated control supply voltage U_s	V	24 AC/DC	24...240 AC/DC	24 AC/DC	24...240 AC/DC	17 ... 275 ¹⁾ AC/DC
Rated frequency for AC	Hz	50/60				40 ... 500
Operating range	V	20.4 ... 27.6	20.4 ... 264	20.4 ... 27.6	20.4 ... 264	17...275
Rated power in W/VA	VA	2/4				
Width	mm	22.5				
RESET		Automatic/manual				
Availability time after application of U_s	ms	1000				
Response time once a switching threshold is reached	ms	Max. 450				
Adjustable tripping delay time	s	0.1 ... 20				
Adjustable ON-delay time	s	--				
Mains buffering time, minimum	ms	10				
Rated insulation voltage U_i Degree of pollution 3 Overvoltage category III acc. to EN 60664-1	V	690				
Rated impulse withstand voltage U_{imp}	kV	6				
Protective separation acc. to EN 60947-1, Annex N	V	300				
Permissible ambient temperature • During operation • During storage	°C °C	-25 ... +60 -40 ... +85				
EMC tests ²⁾		IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4				
Degree of protection • Enclosure • Terminals		IP40 IP20				
Vibration resistance acc. to IEC 60068-2-6		1 ... 6 Hz: 15 mm; 6 ... 500 Hz: 2 g				
Shock resistance acc. to IEC 60068-2-27		12 shocks (half-sine 15 g/11 ms)				
Connection type		 Screw terminals				
• Terminal screw • Solid • Finely stranded with end sleeve • AWG cables, solid or stranded • Tightening torque	mm ² mm ² AWG Nm	M 3 (standard screwdriver, size 2 and Pozidriv 2) 1 x (0.5 ... 4)/2 x (0.5 ... 2.5) 1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5) 2 x (20 ... 14) 0.8 ... 1.2				
Connection type		 Spring-type terminals				
• Solid • Finely stranded, with end sleeves acc. to DIN 46228 • Finely stranded • AWG cables, solid or stranded	mm ² mm ² mm ² AWG	2 x (0.25 ... 1.5) 2 x (0.25 ... 1.5) 2 x (0.25 ... 1.5) 2 x (24 ... 16)				
Measuring circuit						
Permissible measuring range single-phase AC/DC voltage	V	0.1 ... 68		10 ... 650		17 ... 275
Setting range single-phase voltage	V	0.1 ... 60		10 ... 600		17 ... 275
Measuring frequency	Hz	40 ... 500				40 ... 500
Measuring accuracy	%	5				
Repeat accuracy at constant parameters	%	1				
Accuracy of digital display		±1 digit				
Deviations for temperature fluctuations	%/°C	±0.1				
Hysteresis for single-phase voltage	V	0.1 ... 30		0.1 ... 300		0.1 ... 150
Control circuit						
Load capacity of the output relay • Conventional thermal current I_{th}	A	5				
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	A A A A	3 1 0.2 0.1				
Minimum contact load at 17 V DC	mA	5				
Output relay with DIAZED fuse gL/gG operational class	A	4				
Electrical endurance AC15	Million operating cycles	0.1				
Endurance with contactor relay	Million operating cycles	10				

¹⁾ Absolute limit values.

²⁾ Important: This is a Class A product. In the household environment this device may cause radio interference. In this case the user must introduce suitable measures.

Dimensional drawings



Type	3UG46 31 3UG46 32 3UG46 33
A	B

Removable terminal

Screw-type terminal	83	92
Spring-loaded terminal	84	94

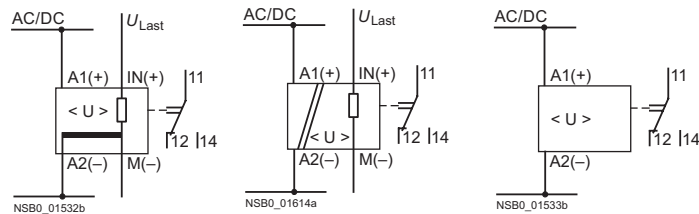
1) For standard mounting rail according to EN 60715.

Schematics

3UG46 31-AA30
3UG46 32-AA30

3UG46 31-AW30
3UG46 32-AW30

3UG46 33

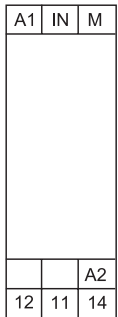


Note: It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

Position of the terminals

3UG46 31
3UG46 32

3UG46 33



Function Relays, Interfaces and Converters

3UG Monitoring Relays

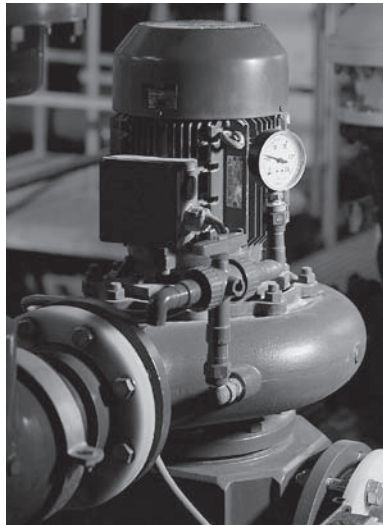
For single-phase current and $\cos \phi$ monitoring

SIRIUS
RELAYS

Monitoring the load of motors and the functionality of electronic loads – a clear case for our 3UG relays that monitor current and $\cos \phi$. These devices detect the effect of wear and faults early on. This means that the appropriate actions can be taken before far more significant damage can occur.

Your advantages:

- 22.5 mm wide
- Can be digitally set and with LCD display
- Fault memory that can be switched-in
- Simultaneous monitoring for current overrange/underrange over the complete measuring range



Current monitoring:

- Wide-voltage versions reduce stock inventory costs
- Only two versions from 2 mA to 10 A
- Can be variably set to overrange, underrange or window monitoring
- Freely parameterizable delay times and reset switch
- Actual value and fault type are permanently displayed
- All of the versions have removable terminals
- All of the versions have screw terminals or, alternatively, innovative Cage Clamp terminals

$\cos \phi$ monitoring:

- $\cos \phi$ is monitored for overrange and underrange
- Fault memory that can be switched-in
- Selectable starting bypass and delay time for threshold value out of range

Applications:

The applications can be seen in the adjacent table. These tables show the various plant/system states can be detected using the monitoring parameters.

3UG4 Monitoring relays – single-phase current monitoring

Measuring range	Hysteresis	Contacts	Starting-bypass time	Off delay	Auxiliary voltage	Order No.	List Price \$
22.5 mm wide, all of the devices can be digitally set and have an LCD display, a fault memory that can be switched-in, simultaneous monitoring for overcurrent and undercurrent over the complete measuring range							
2.0 mA AC/DC up to 500 mA AC/DC	0.1 mA–250 mA	1 CO	0–20 s	0–20 s	24 V AC/DC	3UG4621-□AA30	
					24–240 V AC/DC	3UG4621-□AW30	
0.05 A AC/DC up to 10 A AC/DC	0.01 A–5 A	1 CO	0–20 s	0–20 s	24 V AC/DC	3UG4622-□AA30	
					24–240 V AC/DC	3UG4622-□AW30	

Screw Terminal 1

Spring-type Terminal 2

Power factor and active current monitoring

Measuring range for power factor	Measuring range for active current I_{res}	Power factor hysteresis	Active current hysteresis	On delay	Tripping delay	Rated control supply voltage $V_s^{1)}$	Order No.	List Price \$
22.5 mm wide, all of the devices can be digitally set and have an LCD display, a fault memory that can be switched-in, simultaneous power factor and active current monitoring over the entire measuring range								
0.1–0.99 ($\cos \varphi$)	0.2–10.0 A	0.1 ($\cos \varphi$)	0.1–2.0 A	0–99 s	0.1–20.0 s	90–690 V AC	3UG4641-□CS20	

¹⁾ Absolute limits.

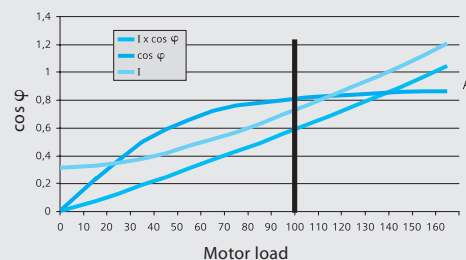
Screw Terminal 1

Spring-type Terminal 2

Monitoring parameter	Plant system states
Current monitoring	<ul style="list-style-type: none"> • Overload monitoring • Underload monitoring close to the rated torque • Monitoring the functionality of electric loads • Wire breakage monitoring • Energy management (phase current monitoring) • Threshold value switch for analog signals up to 20 mA
Power factor and active current monitoring	<ul style="list-style-type: none"> • No-load monitoring • Underload monitoring in the lower power range • Extremely simple power factor monitoring of line supplies to control compensation equipment • Energy management • Interrupted cable between the cabinet and the motor



Current and $\cos \varphi$ as a function of the motor load

Rule of thumb:
 $\cos \varphi$ changes significantly below the rated load; the current increases overproportionally above the rated load.



The active current I_{res} indicates a linear correlation between the motor load and the measured value over the entire measuring range.

Technical specifications

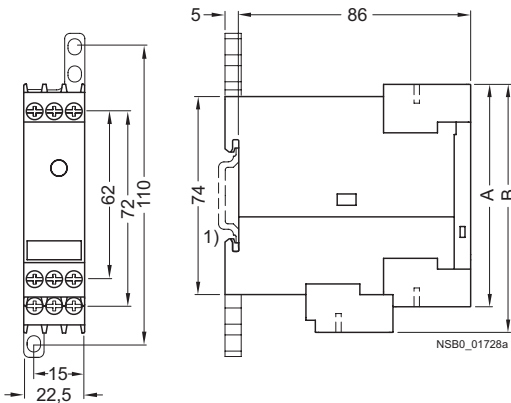
		3UG46 21-AA	3UG46 21-AW	3UG46 22-AA	3UG46 22-AW
General data					
Rated control supply voltage U_s	V	24	24 ... 240	24	24 ... 240
Rated frequency	Hz	50/60			
Operating range	V	20.4 ... 26.4	20.4 ... 264	20.4 ... 26.4	20.4 ... 264
Rated power	W/VA	2/4			
Width	mm	22.5			
RESET		Automatic/manual			
Availability time after application of U_s	ms	1000			
Response time once a switching threshold is reached	ms	Max. 450			
Adjustable tripping delay time/ON-delay time	s	0.1 ... 20			
Mains buffering time, minimum	ms	10			
Rated insulation voltage U_i Degree of pollution 3; overvoltage category III acc. to EN 60664-1	V	690			
Rated impulse withstand voltage U_{imp}	kV	6			
Protective separation acc. to EN 60947-1, Annex N	V	300			
Permissible ambient temperature • During operation • During storage	°C °C	-25 ... +60 -40 ... +85			
EMC tests ¹⁾		IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4			
Degree of protection • Enclosure • Terminals		IP40 IP20			
Vibration resistance acc. to IEC 60068-2-6		1 ... 6 Hz: 15 mm; 6 ... 500 Hz: 2 g			
Shock resistance acc. to IEC 60068-2-27		12 shocks (half-sine 15 g/11 ms)			
Connection type		 Screw terminals			
• Terminal screw • Solid • Finely stranded with end sleeve • AWG cables, solid or stranded • Tightening torque	mm ² mm ² AWG Nm	M 3 (standard screwdriver, size 2 and Pozidriv 2) 1 x (0.5 ... 4)/2 x (0.5 ... 2.5) 1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5) 2 x (20 ... 14) 0.8 ... 1.2			
Connection type		 Spring-type terminals			
• Solid • Finely stranded, with end sleeves acc. to DIN 46228 • Finely stranded • AWG cables, solid or stranded	mm ² mm ² mm ² AWG	2 x (0.25 ... 1.5) 2 x (0.25 ... 1.5) 2 x (0.25 ... 1.5) 2 x (24 ... 16)			
Measuring circuit					
Measuring range for single-phase AC/DC current	A	0.003 ... 0.6		0.05 ... 15	
Setting range for single-phase current	A	0.003 ... 0.5		0.05 ... 10	
Load supply voltage	V	24	Max. 300 ²⁾ Max. 500 ³⁾	24	Max. 300 ²⁾ Max. 500 ³⁾
Measuring accuracy	%	5			
Repeat accuracy at constant parameters	%	1			
Accuracy of digital display		±1 digit			
Deviations for temperature fluctuations	%/°C	±0.1			
Hysteresis for single-phase current		0.1 ... 250 mA		0.01 ... 5 A	
Permissible overcurrent, continuous	A	0.6		15	
Permissible overcurrent, < 1 s	A	5		50	
Protection against destruction, DIAZED gL/gG	A	2		16	
Measuring circuit internal resistance, shunt	mΩ	500		5	
Control circuit					
Load capacity of the output relay • Conventional thermal current I_{th}	A	5			
Rated operational current I_o at • AC-15/24 ... 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	A A A A	3 1 0.2 0.1			
Minimum contact load at 17 V DC	mA	5			
Output relay with DIAZED fuse gL/gG	A	4			
Electrical endurance AC15 (million operating cycles)		0.1			
Endurance with contactor relay (million operating cycles)		10			

¹⁾ Important: This is a Class A product. In the household environment this device may cause radio interference. In this case the user must introduce suitable measures.

²⁾ With protective separation.

³⁾ With simple separation.

Dimensional drawings



Type	3UG46 21 3UG46 22	A	B
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Removable terminal

Screw-type terminal	83	92
Spring-loaded terminal	84	94

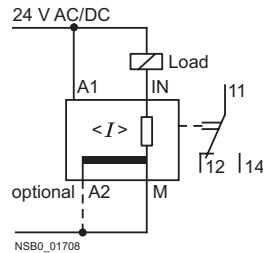
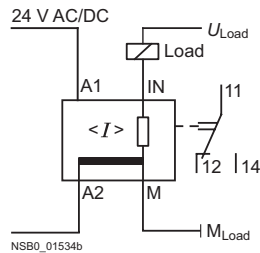
1) For standard mounting rail according to EN 60715.

Schematics

3UG46 21-AA30 3UG46 22-AA30

Operation with separate control circuit and load circuit

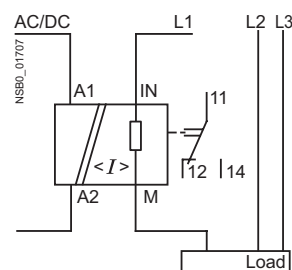
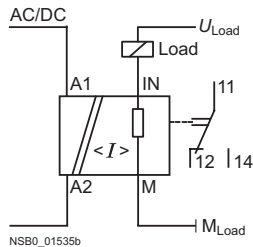
Operation with joint control circuit and load circuit



3UG46 21-AW30 3UG46 22-AW30

Single-phase operation

3-phase operation



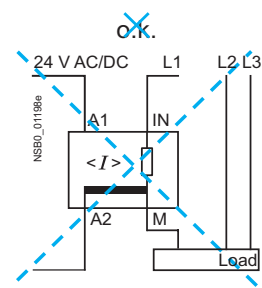
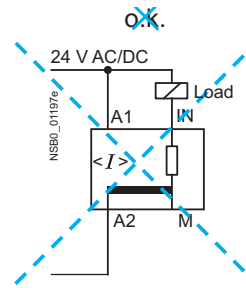
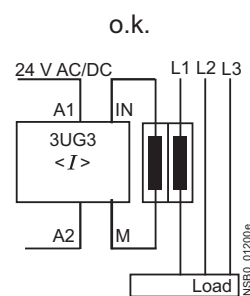
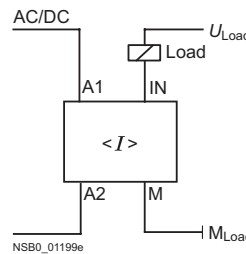
Position of the terminals

3UG46 21
3UG46 22

A1	IN	M
12	11	14
A2		

Wiring diagram for 24 V AC/DC (only 3UG46 2-AA30)

From the following circuit diagrams it is clear that loads in measuring circuits have to be in the current flow upstream from the monitoring relay. Otherwise, the monitoring relay could be destroyed and the short-circuit current could cause damage to the plant.





Configuring note:

A2 and M are electrically connected internally!

For applications in which the load to be monitored and the monitoring relay are supplied from the same power supply, there is no need for connection A2!

The load current must always flow through M or the monitoring relay may be destroyed!

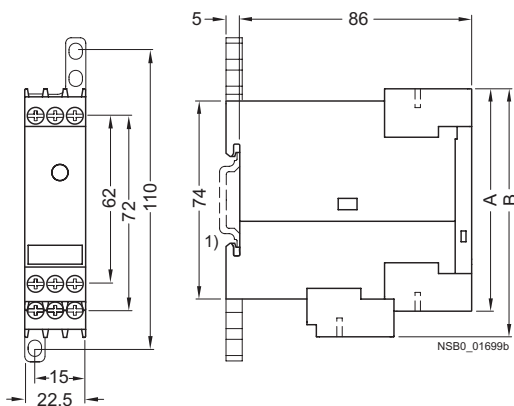
Technical specifications

Type		3UG46 41
General data		
Rated control supply voltage U_s	V	90 ... 690
Rated frequency	Hz	50/60
Rated power, typical		
• At 200 V AC	VA	2.0
• At 400 V AC	VA	2.7
• At 460 V AC	VA	3.1
Width	mm	22.5
RESET		Automatic/manual
Principle of operation		Closed-circuit principle, open-circuit principle
Availability time after application of U_s	ms	1000
Response time once a switching threshold is reached	ms	Max. 450
Adjustable tripping delay time	s	0.1 ... 20
Adjustable ON-delay time	s	0 ... 99
Mains buffering time, minimum	ms	10
Rated insulation voltage U_i	V	690
Degree of pollution 3 Overvoltage category III acc. to EN 60664-1		
Rated impulse withstand voltage	kV	6
Permissible ambient temperature		
• During operation	°C	-25 ... +60
• During storage	°C	-40 ... +85
EMC tests ¹⁾		IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4
Degree of protection		
• Enclosure		IP40
• Terminals		IP20
Vibration resistance acc. to IEC 60068-2-6		1 ... 6 Hz: 15 mm; 6 ... 500 Hz: 2 g
Shock resistance acc. to IEC 60068-2-27		12 shocks (half-sine 15 g/11 ms)
Connection type		 Screw terminals
• Terminal screw		M 3 (standard screwdriver, size 2 and Pozidriv 2)
• Solid	mm ²	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm ²	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)
• Tightening torque	Nm	0.8 ... 1.2
Connection type		 Spring-type terminals
• Solid	mm ²	2 x (0.25 ... 1.5)
• Finely stranded, with end sleeves acc. to DIN 46228	mm ²	2 x (0.25 ... 1.5)
• Finely stranded	mm ²	2 x (0.25 ... 1.5)
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)
Measuring circuit		
Measurable active current I_{res}	A	0.2 ... 10
Max. permissible load current	A	10
Peak current < 1 s	A	50
Adjustable response value		0.1 ... 0.99
Phase displacement angle		
DIAZED protection, gL/gG operational class	A	16
Measuring accuracy	%	10
Repeat accuracy at constant parameters	%	1
Accuracy of digital display		± 1 digit
Deviations for temperature fluctuations	%/°C	±0.1
Hysteresis		0.10
Phase angle		
Hysteresis	A	0.1 ... 2.0
Active current monitoring		

¹⁾ Important: This is a Class A product. In the household environment this device may cause radio interference. In this case the user must introduce suitable measures.

Type	3UG46 41	
Control circuit		
Number of CO contacts for auxiliary contacts	2	
Load capacity of the output relay		
• Conventional thermal current I_{th}	A	5
Rated operational current I_e at		
• AC-15/24 ... 400 V	A	3
• DC-13/24 V	A	1
• DC-13/125 V	A	0.2
• DC-13/250 V	A	0.1
Minimum contact load at 17 V DC	mA	5
Output relay with DIAZED fuse	A	4
gL/gG operational class		
Electrical endurance AC-15	Million operating cycles	0.1
Mechanical endurance	Million operating cycles	10

Dimensional drawings



Type	3UG46 41	
	A	B

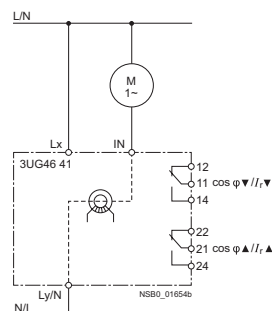
Removable terminal

Screw-type terminal	83	92
Spring-loaded terminal	84	94

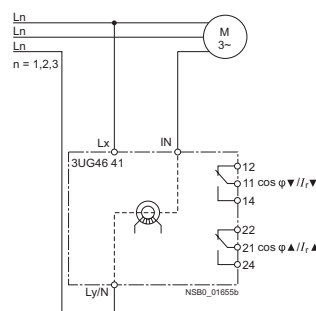
1) For standard mounting rail according to EN 60715.

Schematics

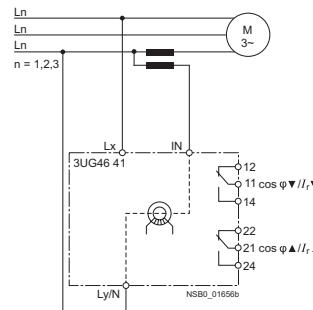
Single-phase motors



3-phase motors



3-phase motors with transformers for currents > 10 A



Legend

$\cos \varphi$: p. f.

Position of the terminals

3UG46 41

Lx	Ly/N	IN
12	11	14
22	21	24

Function Relays, Interfaces and Converters

3UG Monitoring Relays

SIRIUS
RELAYS

Residual current monitoring: Residual-current monitoring relays

Overview



The 3UG46 24 residual current monitoring relay is used together with the 3UL22 summation current transformer for plant monitoring.

Application

- Plant monitoring

Selection and ordering data

- Relay for monitoring residual currents $I_{\Delta n}$ 0.3 ... 40 A
- For 3UL22 summation current transformers with feed-through opening 40 ... 120 mm
- Digital adjustable, with illuminated LCD
- Separately adjustable limit value and warning threshold
- Permanent display of actual value and tripping state
- 1 CO contact each for limit violation and warning threshold
- All terminals are removable
- Width 22.5 mm

Display range	Setting range	Hysteresis		ON/tripping delay time	Rated control supply voltage $U_s^{(2)}$	Screw terminals		PU (UNIT, SET, M)	PS*	Weight per PU approx.
		Limit value	Warning value			Order No.	List Price \$ per PU			
A	A	A	A	s	V					kg
10 ... 120 % of $I_{\Delta n}$	10 ... 100 % of $I_{\Delta n}$	LSB ¹⁾ up to 50 % of $I_{\Delta n}$	5 % of $I_{\Delta n}$	0.1 ... 20	90 ... 690	3UG46 24-1CS20		1	1 unit	0.147

Display range	Setting range	Hysteresis		ON/tripping delay time	Rated control supply voltage $U_s^{(2)}$	Spring-type terminals		PU (UNIT, SET, M)	PS*	Weight per PU approx.
		Limit value	Warning value			Order No.	List Price \$ per PU			
A	A	A	A	s	V					kg
10 ... 120 % of $I_{\Delta n}$	10 ... 100 % of $I_{\Delta n}$	LSB ¹⁾ up to 50 % of $I_{\Delta n}$	5 % of $I_{\Delta n}$	0.1 ... 20	90 ... 690	3UG46 24-2CS20		1	1 unit	0.130

¹⁾ LSB: Smallest adjustable value, transformer-dependent, ≤ 1 % of $I_{\Delta n}$.

²⁾ Absolute limit values.

Selection and ordering data

Feed-through opening diameter	Rated insulation voltage U_l	Rated fault current $I_{\Delta n}$	Screw terminals		PU (UNIT, SET, M)	PS*	Weight per PU approx.
mm	V	A	Order No.	List Price \$ per PU			kg



Summation current transformers (essential accessory for 3UG46 24 or SIMOCODE 3UF)



3UL22

40	690	0.3	3UL22 01-1A	1	1 unit	0.571
		0.5	3UL22 01-2A	1	1 unit	0.408
		1	3UL22 01-3A	1	1 unit	0.324
65	690	0.3	3UL22 02-1A	1	1 unit	0.900
		0.5	3UL22 02-2A	1	1 unit	0.713
		1	3UL22 02-3A	1	1 unit	0.568
		6	3UL22 02-1B	1	1 unit	0.561
		10	3UL22 02-2B	1	1 unit	0.563
		16	3UL22 02-3B	1	1 unit	0.573
		25	3UL22 02-4B	1	1 unit	0.575
		40	3UL22 02-5B	1	1 unit	0.564
120	1000	0.3	3UL22 03-1A	1	1 unit	3.435
		0.5	3UL22 03-2A	1	1 unit	2.810
		1	3UL22 03-3A	1	1 unit	1.965
		6	3UL22 03-1B	1	1 unit	1.955
		10	3UL22 03-2B	1	1 unit	1.990
		16	3UL22 03-3B	1	1 unit	1.917
		25	3UL22 03-4B	1	1 unit	1.851
		40	3UL22 03-5B	1	1 unit	1.905

Technical specifications

Type	3UG46 24	
General data		
Rated control supply voltage U_s	V	90 ... 690 ¹⁾
Rated frequency	Hz	50/60
Rated power, typical		
• At 90 V AC	VA	2.8
• At 230 V AC	VA	2.4
• At 400 V AC	VA	3.1
• At 460 V AC	VA	3.2
• At 690 V AC	VA	4.7
Width	mm	22.5
RESET		Automatic/manual
Principle of operation		Closed-circuit principle, open-circuit principle
Availability time after application of U_s	ms	1000
Response time once a switching threshold is reached	ms	Max. 300
Adjustable delay time	s	0.1... 20
Mains buffering time, minimum	ms	10
Rated insulation voltage U_i Degree of pollution 3 Overvoltage category III acc. to EN 60664-1	V	690
Rated impulse withstand voltage	kV	6
Permissible ambient temperature		
• During operation	°C	-25 ... +60
• During storage	°C	-40 ... +85
EMC tests ²⁾		IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4
Degree of protection		
• Enclosure		IP40
• Terminals		IP20
Vibration resistance acc. to IEC 60068-2-6		1 ... 6 Hz: 15 mm; 6 ... 500 Hz: 2 g
Shock resistance acc. to IEC 60068-2-27		12 shocks (half-sine 15 g/11 ms)
Connection type		 Screw terminals
• Terminal screw		M3 (for standard screw driver size 2 and Pozidriv 2)
• Solid	mm ²	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm ²	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)
• Tightening torque	NM	0.8 ... 1.2
Connection type		 Spring-type terminals
• Solid	mm ²	2 x (0.25 ... 1.5)
• Finely stranded, with end sleeves acc. to DIN 46228	mm ²	2 x (0.25 ... 1.5)
• Finely stranded	mm ²	2 x (0.25 ... 1.5)
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)
Measuring circuit		
Measurable residual current I_{res}	A	10 ... 120 % $I_{\Delta n}$ ($I_{\Delta n}$: rated residual current of the transformer)
Adjustable response value		
• Residual current		10 ... 100 % $I_{\Delta n}$
• Warning		10 ... 100 % $I_{\Delta n}$
Measuring accuracy	%	±5
Repeat accuracy at constant parameters	%	±1
Accuracy of digital display		± 1 digit
Deviations for temperature changes	%/°C	±0.1
Hysteresis for residual current		LSB ³⁾ up to 50 % $I_{\Delta n}$
Hysteresis for warning threshold	A	5 % $I_{\Delta n}$

1) Absolute limit values.

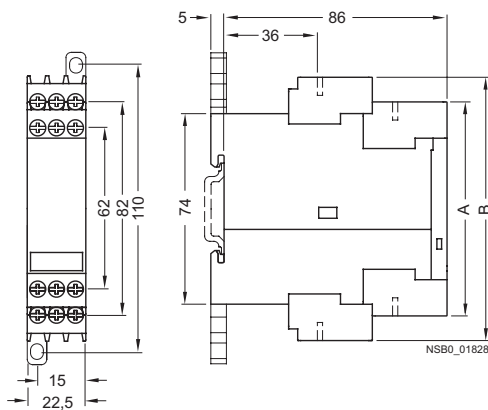
2) Important: This is a Class A product. In the household environment this device may cause radio interference. In this case the user must take suitable precautions.

3) LSB: Smallest adjustable value, transformer-dependent, ≤ 1 % of $I_{\Delta n}$.

Type	3UG46 24	
Control circuit		
Number of CO contacts for auxiliary contacts	2	
Load capacity of the output relay		
Conventional thermal current I_{th}	A	5
Rated operational current I_e at		
• AC-15/24 ... 400 V	A	3
• DC-13/24 V	A	1
• DC-13/125 V	A	0.2
• DC-13/250 V	A	0.1
Minimum contact load at 17 V DC	mA	5
Output relay with DIAZED fuse	A	4
gL/gG operational class		
Electrical endurance AC-15	Million operating cycles	0.1
Mechanical endurance	Million operating cycles	10

Dimensional drawings

3UG46 24



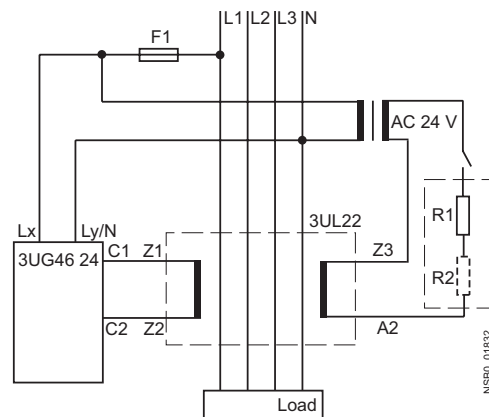
Type	3UG46 24	
	A	B

Removable terminal

Screw-type terminal	83	102
Spring-loaded terminal	84	103

1) For standard mounting rail according to EN 60715.

Circuit example



Type	$I_{\Delta n}$	R1	R2
3UL22 0.-1A	0.3 A	220 $\Omega \geq 3$ W	--
3UL22 0.-2A	0.5 A		
3UL22 0.-3A	1 A		
3UL22 0.-1B	6 A	22 $\Omega \geq 6$ W	22 $\Omega \geq 6$ W
3UL22 0.-2B	10 A		
3UL22 0.-3B	16 A		
3UL22 0.-4B	25 A		
3UL22 0.-5B	40 A		

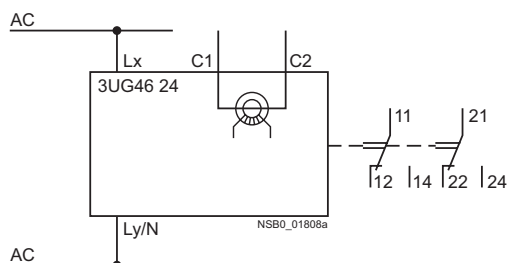
Position of the terminals

	C1	C2
Lx	Ly/N	
12	11	14
22	21	24

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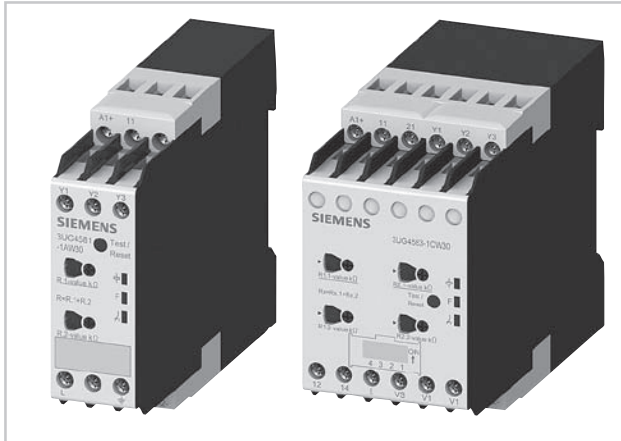
Schematics

3UG46 24



Note: It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

Overview



SIRIUS 3UG45 8. insulation monitor

Isolation monitoring relays are used for monitoring the insulation resistance between ungrounded single or three-phase AC supplies and a protective conductor.

Ungrounded, i. e. isolated networks (IT networks) are always used where high demands are placed on the reliability of the power supply, e. g. emergency lighting systems. IT systems are supplied via an isolating transformer or by power supplies such as batteries or a generator. While an initial insulation fault between a phase conductor and the ground effectively grounds the conductor, as a result no circuit has been closed, so it is possible to continue work in safety (single-fault safety). However, the fault must be rectified as quickly as possible before a second insulation fault occurs (e. g. according to DIN VDE 0100-410). For this purpose insulation monitoring relays are used, which constantly measure the resistance to ground of the phase conductor and the neutral conductor, reporting a fault immediately if insulation resistance falls below the set value so that either a controlled shutdown can be performed or the fault can be rectified without interrupting the power supply.

Two series

- 3UG45 81 insulation monitoring relays for ungrounded AC networks
- 3UG45 82, 3UG45 83 insulation monitoring relays for ungrounded DC and AC networks

Benefits

- Devices for AC and DC systems
- All devices have a wide control supply voltage range
- Direct connection to networks with mains voltages of up to 690 V AC and 1000 V DC by means of a voltage reducer module
- For AC mains: Frequency range 15 ... 400 Hz
- Monitoring of broken conductors
- Monitoring of setting errors
- Safety in use thanks to integrated system test after startup
- Option of resetting and testing (by means of pushbutton on front or using control contact)
- New predictive measurement principle allows very fast response times

Application

IT networks are used for example:

- In emergency power supplies
- In safety lighting systems
- In industrial production facilities with high availability requirements (chemical industry, automobile manufacturing, printing plants)
- In shipping and railways
- For mobile generators (aircraft)
- For renewable energies, such as wind energy and photovoltaic power plants
- In the mining industry

Function Relays, Interfaces and Converters

SIRIUS 3UG Monitoring Relays for Stand-Alone Installation

SIRIUS
RELAYS

Insulation monitoring

Technical specifications

General data			
Type	3UG45 81-1AW30	3UG45 82-1AW30	3UG45 83-1AW30
Setting range for the setpoint response values • 1 ... 100 kΩ • 2 ... 200 kΩ	✓ --	✓ --	✓ ✓
Rated voltage of the network being monitored • 0 ... 250 V AC • 0 ... 440 V AC • 0 ... 690 V AC • 0 ... 300 V DC • 0 ... 600 V DC • 0 ... 1000 V DC	-- ✓ -- -- -- --	✓ -- -- ✓ -- --	-- ✓ ✓ ¹⁾ -- -- ✓ ¹⁾
Max. leakage capacitance of the system • 10 μF • 20 μF	✓ --	✓ --	-- ✓
Output contacts • 1 CO • 2 CO or 1 CO + 1 CO, adjustable	✓ --	✓ --	-- ✓
Number of limit values • 1 • 1 or 2, adjustable	✓ --	✓ --	-- ✓
Principle of operation	Closed-circuit principle	Closed-circuit principle	Open-circuit/closed-circuit principle, adjustable
Rated control supply voltage • 24 ... 240 V AC/DC	✓	✓	✓
Rated frequency • 13.5 ... 440 Hz • 45 ... 65 Hz	-- ✓	-- ✓	✓ --
Auto or manual RESET	✓ Adjustable	✓ Adjustable	✓ Adjustable
Remote-RESET	✓ Via control input	✓ Via control input	✓ Via control input
Non-volatile error memory	--	--	✓ Adjustable
Broken wire detection	--	--	✓ Adjustable
Replacement for			
Rated control supply voltage U_s	Voltage range of the network being monitored		
3UG30 81-1AK20 110 ... 130/220 ... 240 V AC/DC	3 x 230/400 V AC	✓	--
3UG30 81-1AW30 24 ... 240 V AC/DC	3 x 230/400 V AC	✓	--
3UG30 82-1AW30 24 ... 240 V AC/DC	24 ... 240 V DC	--	✓

✓ Available

-- Not available

¹⁾ With voltage reducer module.

Overview



SIRIUS 3UG45 81 insulation monitor

The 3UG45 81 insulation monitoring relays are used to monitor insulation resistance in accordance with IEC 61557-8 in ungrounded AC networks with rated voltages of up to 400 V.

These devices can monitor control circuits (single-phase) and main circuits (three phase).

They measure insulation resistances between system cables and system ground. If the value falls below the threshold value, the output relays are switched to fault status.

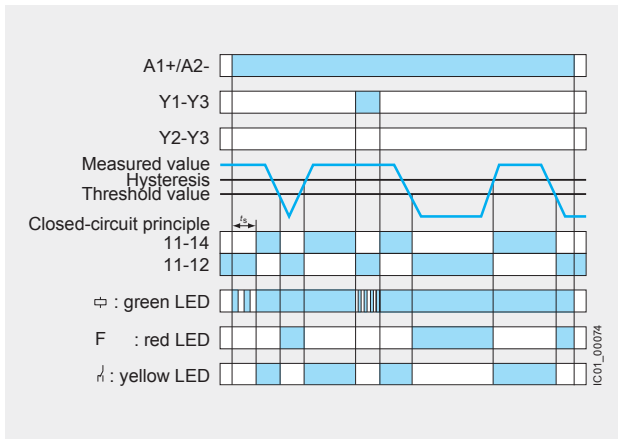
In the case of 3UG45 81 a higher-level DC measuring signal is used. The higher-level DC measuring signal and the resulting current are used to determine the value of the insulation resistance of the network which is to be measured.

Technical specifications

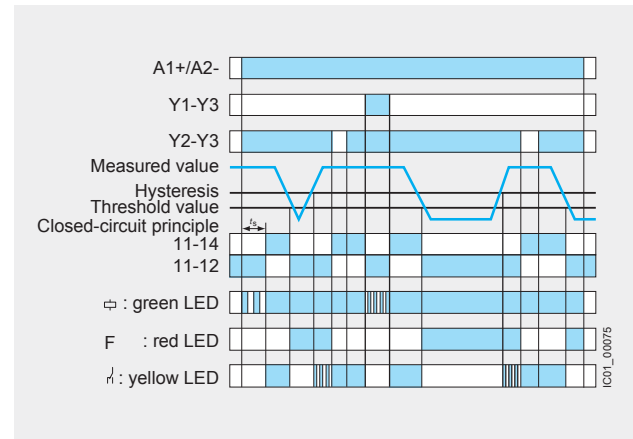
3UG45 81 monitoring relays

With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with auto RESET



Insulation resistance monitoring with fault storage and manual RESET

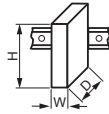



Function Relays, Interfaces and Converters

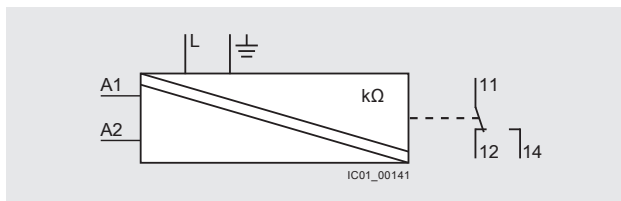
SIRIUS 3UG Monitoring Relays for Stand-Alone Installation

SIRIUS
RELAYS

Insulation monitoring for ungrounded AC networks

Type	3UG45 81		
Dimensions (W x H x D)		mm	22.5 x 100 x 100
Connection type		 Screw terminals	
<ul style="list-style-type: none"> • Solid • Finely stranded with end sleeve • AWG cables, solid or stranded 	mm ² mm ² AWG		2 x (0.5 ... 4) 2 x (0.75 ... 2.5) 2 x (20 ... 14)
General data			
Rated insulation voltage U_i	V		400 supply circuit/measuring circuit 300 supply circuit/output circuit
Pollution degree 3 Overvoltage category III acc. to IEC 60664			
Rated impulse withstand voltage	kV		6
Rated control supply voltage	V		24 ... 240 AC/DC
Rated frequency	Hz		15 ... 400
Measuring circuit			
Rated system voltage of the network being monitored	V		0 ... 400
Rated frequency of the network being monitored	Hz		50 ... 60
Setting range for insulation resistance	k Ω		1 ... 100
Control circuit			
Load capacity of the output relay			
• Conventional thermal current I_{th}	A		4
Rated operational current I_e at			
• AC-15/24 ... 400 V	A		3
• DC-13/24 V	A		2
Minimum contact load at 24 V DC	mA		10

Circuit diagram

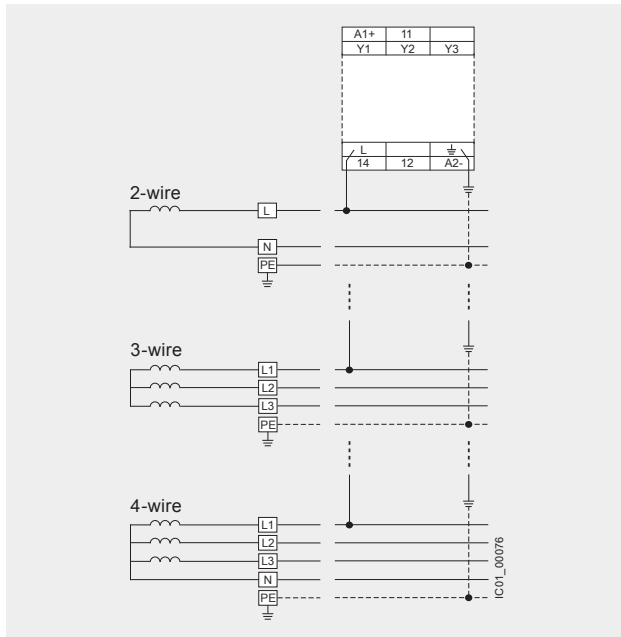


3UG45 81

Note:

It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

Connection diagrams for networks up to 400 V AC



Selection and ordering data

- Auto or manual RESET
- Closed-circuit principle
- 1 CO contact
- Fault memory adjustable using control input (S2-S3)
- Reset by means of pushbutton on front or using control input (S2-S3)
- Test by means of pushbutton on front or using control input (S1-S3)

Rated system voltage U_n	Measuring range U_e	Rated control supply voltage U_s	System leakage capacitance	DT	Screw terminals	PU (UNIT, SET, M)	PS*	PG
V AC	kΩ	V	μF		Order No.	Price per PU		

Insulation monitors for ungrounded AC networks

0 ... 400	1 ... 110	24 ... 240 AC/DC	max. 10	B	3UG45 81-1AW30	1	1 unit	41H
-----------	-----------	------------------	---------	---	-----------------------	---	--------	-----



3UG45 81-1AW30

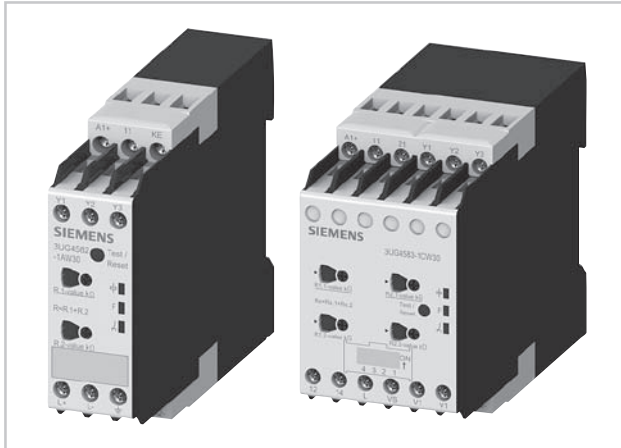
Function Relays, Interfaces and Converters

SIRIUS 3UG Monitoring Relays for Stand-Alone Installation

SIRIUS
RELAYS

Insulation monitoring for ungrounded
DC and AC networks

Overview



SIRIUS 3UG45 82 and 3UG45 83 insulation monitors

The 3UG45 82 and 3UG45 83 insulation monitoring relays are used to monitor insulation resistance in ungrounded IT AC or DC networks in accordance with IEC 61557-8.

They measure insulation resistances between system cables and system ground. If the value falls below the threshold value, the output relays are switched to fault status. With these devices, which are suitable for both AC and DC networks, a pulsed test signal is fed into the network to be monitored and the isolation resistance is determined.

The pulsed test signal changes its form according to insulation resistance and network loss capacitance. The changed form is used to predict the changed insulation resistance.

If the predicted insulation resistance matches the insulation resistance calculated in the next measurement cycle, and is lower than the threshold value, the output relays are activated or deactivated, depending on the device configuration. This measurement principle is also suitable for identifying symmetrical insulation faults.

3UG49 83 voltage reducer modules

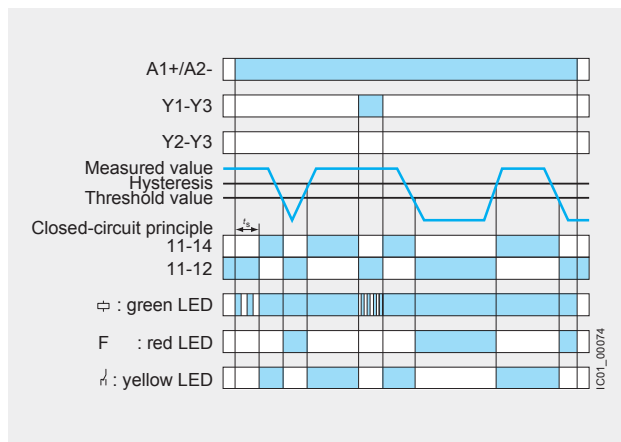
The 3UG49 83 passive voltage reducer module can be used to allow the 3UG45 83 insulation monitoring relay to be used for insulation monitoring of IT networks with rated voltages of up to 690 V AC and 1000 V DC.

Technical specifications

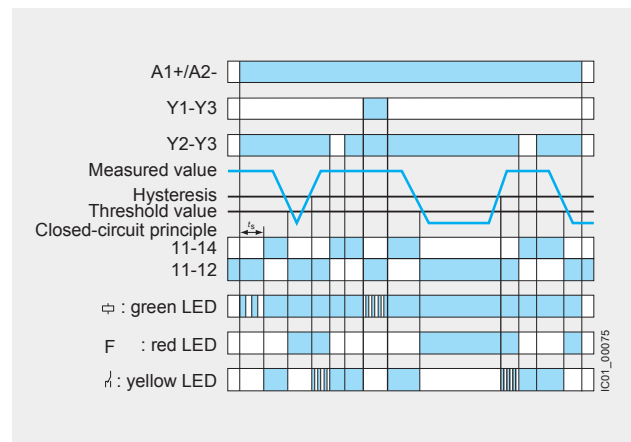
3UG45 82 monitoring relays

With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with auto RESET



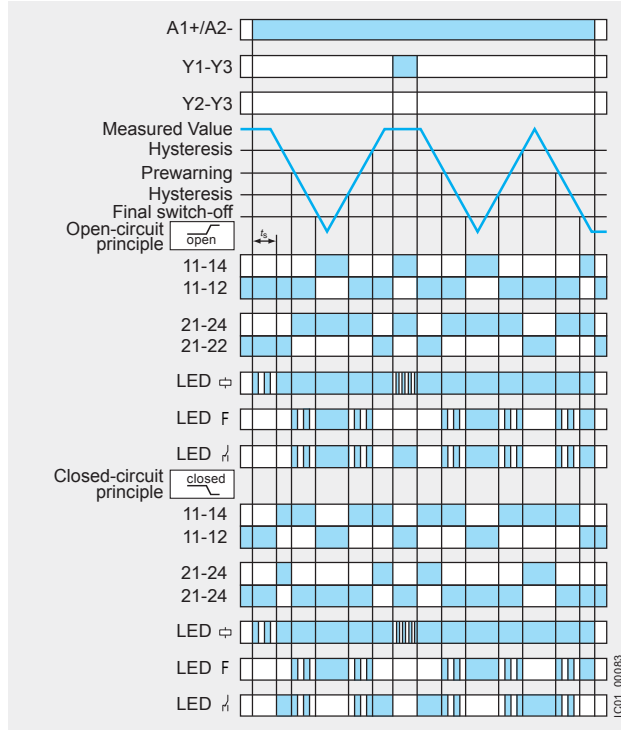
Insulation resistance monitoring with fault storage and manual RESET



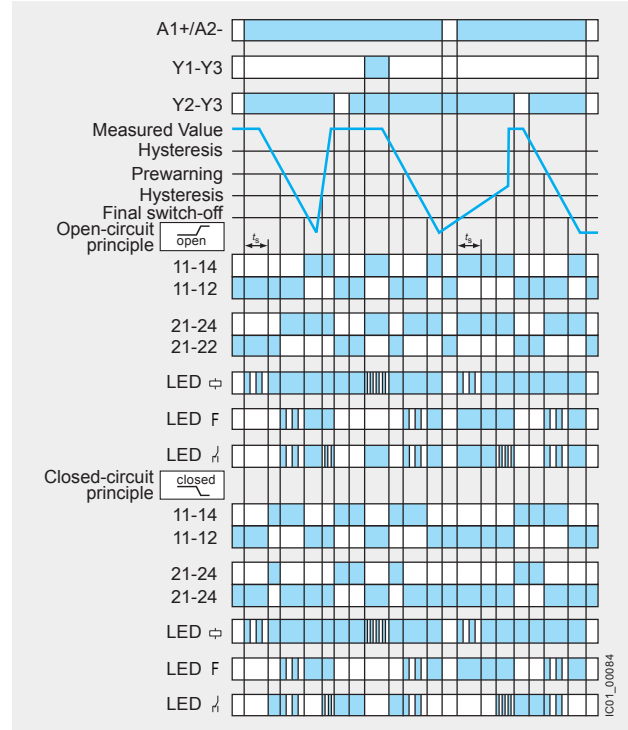
3UG45 83 monitoring relays

With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with auto RESET



Insulation resistance monitoring with fault storage and manual RESET



Type		3UG45 82	3UG45 83
Dimensions (W x H x D)	mm	22.5 x 100 x 100	45 x 100 x 100
Connection type		Screw terminals	
• Solid	mm ²	2 x (0.5 ... 4)	
• Finely stranded with end sleeve	mm ²	2 x (0.75 ... 2.5)	
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)	
General data			
Rated insulation voltage U_i	V	400 supply circuit/measuring circuit	400 supply circuit/measuring circuit
Pollution degree 3		300 supply circuit/output circuit	300 supply circuit/output circuit,
Overvoltage category III acc. to IEC 60664			300 output circuit 1/output circuit 2
Rated impulse withstand voltage	kV	6	
Rated control supply voltage	V	24 ... 240 AC/DC	
Rated frequency	Hz	15 ... 400	
Measuring circuit			
Rated system voltage of the network being monitored	V	0 ... 250 AC, 0 ... 300 DC	0 ... 300 AC, 0 ... 690 AC with 3UG49 83 0 ... 600 DC, 0 ... 1000 DC with 3UG49 83
Rated frequency of the network being monitored	Hz	DC or 15 ... 400	
Setting range for insulation resistance	kΩ	1 ... 100	1 ... 100 2 ... 200 for 2nd limit value (disconnectable)
Control circuit			
Number of CO contacts for auxiliary contacts		1	2 or 1 + 1, adjustable
Load capacity of the output relay			
• Conventional thermal current I_{th}	A	4	
Rated operational current I_e at			
• AC-15/24 ... 400 V	A	3	
• DC-13/24 V	A	2	
Minimum contact load at 24 V DC	mA	10	

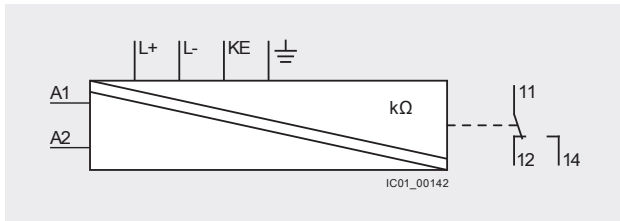
Function Relays, Interfaces and Converters

SIRIUS 3UG Monitoring Relays for Stand-Alone Installation

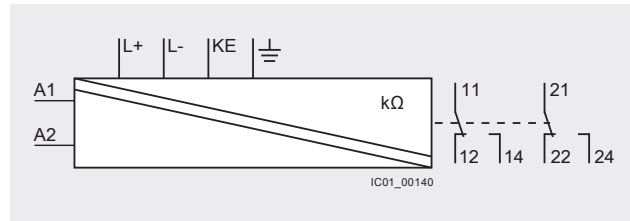
Insulation monitoring for ungrounded
DC and AC networks

SIRIUS
RELAYS

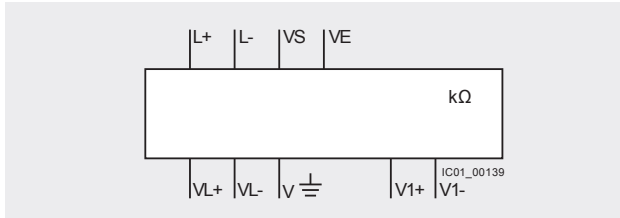
Circuit diagrams



3UG45 82



3UG45 83



3UG49 83

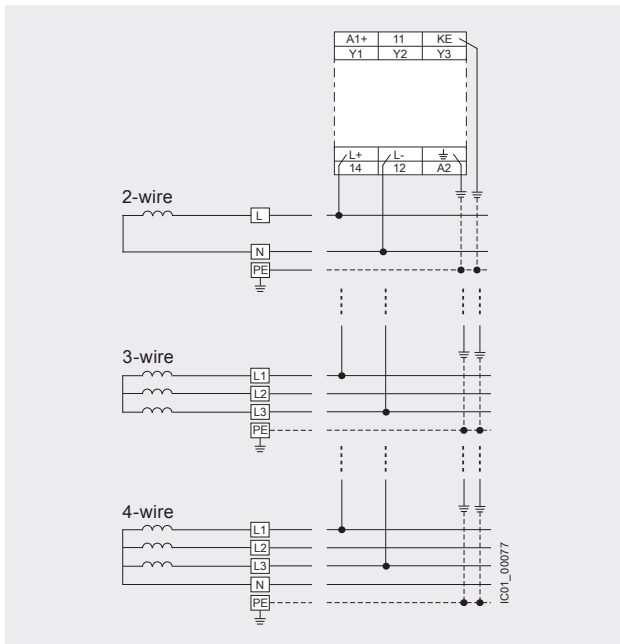
Note:

It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

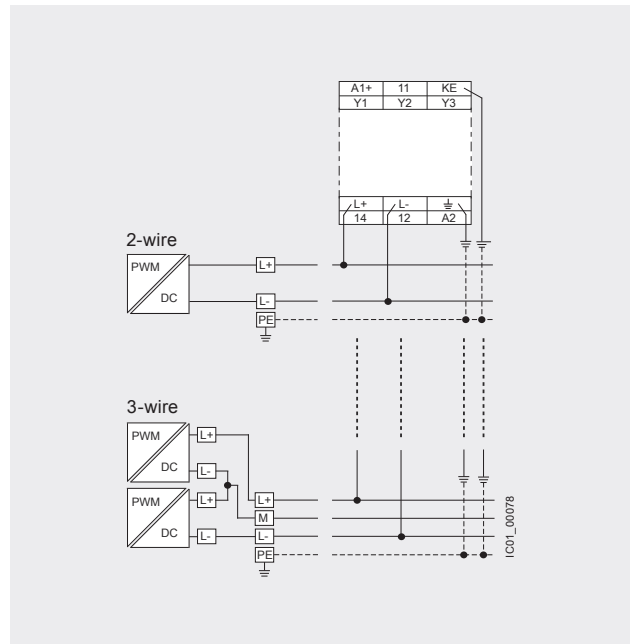
Connection diagrams

3UG45 82

AC network, 2-wire, 3-wire or 4-wire



DC network, 2-wire or 3-wire

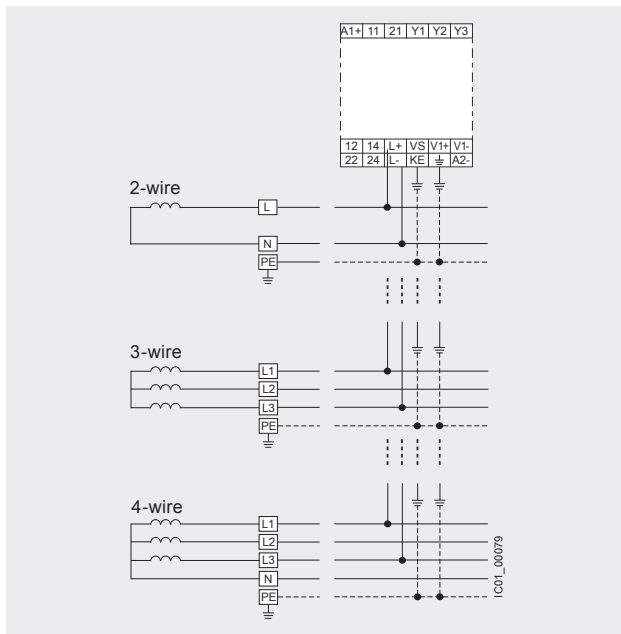


Note:

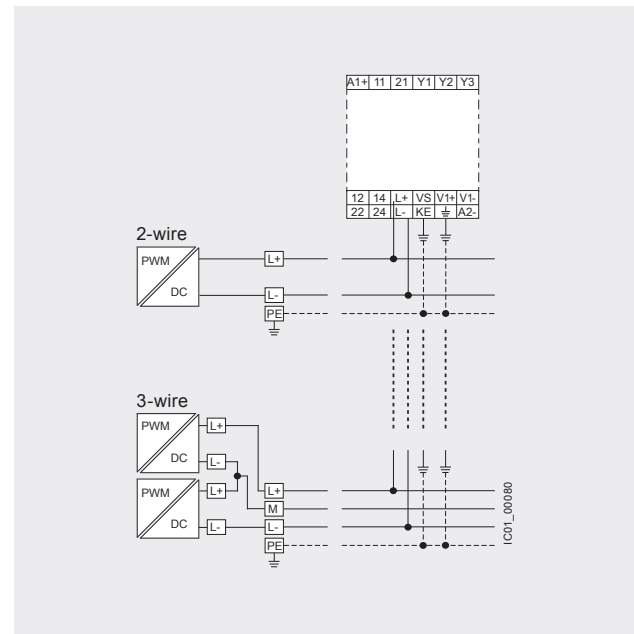
L+ and L- can be connected to any wire, but each to a different wire. $U_n \leq 250$ V AC or 300 V DC.

3UG45 83

AC network, 2-wire, 3-wire or 4-wire



DC network, 2-wire or 3-wire

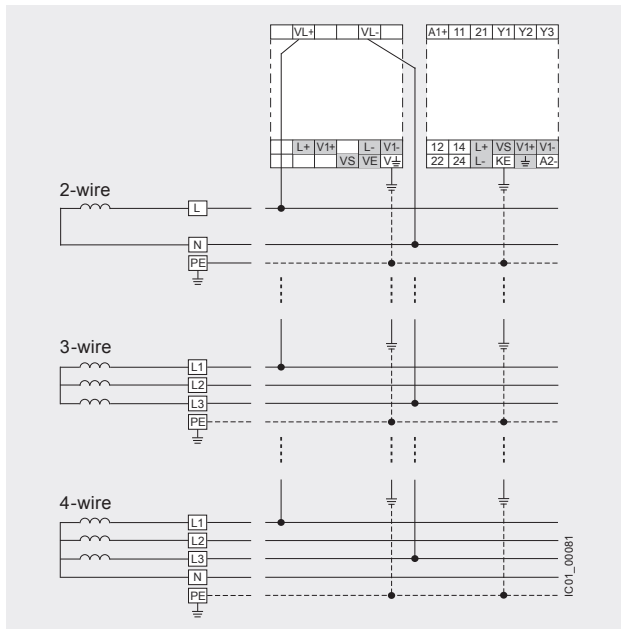


Note:

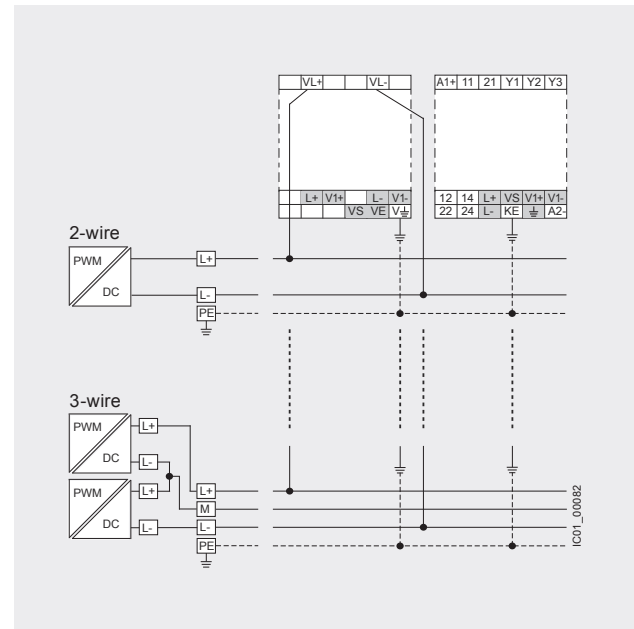
L+ and L- can be connected to any wire, but each to a different wire. $U_n \leq 400$ V AC or 600 V DC.
Use a voltage reducer module to monitor systems with higher voltages.

3UG49 83 voltage reducer modules

AC network, 2-wire, 3-wire or 4-wire



DC network, 2-wire or 3-wire



Note:

L+ and L- can be connected to any wire, but each to a different wire. $U_n \leq 400$ V AC or 600 V DC.
Use a voltage reducer module to monitor systems with higher voltages.

Function Relays, Interfaces and Converters

SIRIUS 3UG Monitoring Relays for Stand-Alone Installation

SIRIUS RELAYS


Insulation monitoring for ungrounded DC and AC networks

Selection and ordering data

- Auto or manual RESET
- 3UG45 82: Open-circuit principle
- 3UG45 83: Open-circuit or closed-circuit principle, adjustable
- 1 or 2 CO contacts
- Fault memory adjustable using control input (S2-S3)
- Reset by means of pushbutton on front or using control input (S2-S3)
- Test by means of pushbutton on front or using control input (S1-S3)
- 3UG45 83: Non-volatile fault storage can be configured
- 3UG45 83: 2 separate limit values (e.g. for warning and disconnection) or 2 CO contacts for one limit value (e.g. for a local alarm and signaling to the PLC via separate circuits) can be configured

Note:

With the 3UG49 83-1A coupling unit, connection to networks with a voltage of up to 690 V AC and 1000 V DC is possible, [see below](#).

Rated system voltage U_n	System leakage capacitance	Output relay	Measuring range U_e	Broken wire detection in the measuring range	DT	Screw terminals 	PU (UNIT, SET, M)	PS*	PG
V	μF		k Ω			Order No.	Price per PU		
SIRIUS 3UG45 82 insulation monitors									
0 ... 250 AC	max. 10	1 CO	1 ... 110	✓	B	3UG45 82-1AW30		1	1 unit 41H
SIRIUS 3UG45 83 insulation monitors									
0 ... 400 AC, 0 ... 600 DC ¹⁾	max. 20	2 CO or 1 CO + 1 CO, adjustable	1 ... 110, 2 ... 200 for 2nd limit value, adjustable	✓ adjustable	B	3UG45 83-1CW30		1	1 unit 41H
3UG45 83 voltage reducer modules									
For extending the mains voltage range to max. 690 V AC and 1000 V DC					B	3UG49 83-1A		1	1 unit 41H



3UG45 82-1AW30



3UG45 83-1AW30



3UG49 83-1A

✓ Available

¹⁾ With 3UG49 83-1A voltage reducer module suitable also for the insulation monitoring of IT networks up to 690 V AC and 1000 V DC.

Overview



The 3UG45 01 level monitoring relay is used together with 2- or 3-pole sensors to monitor the levels of conductive liquids.

Application

- Single-point and two-point level monitoring
- Overflow protection
- Dry run protection
- Leak monitoring

Selection and ordering data

- Level monitoring relay for conductive liquids
- Control principle: inlet or outlet control per rotary switch
- Single-point and two-point control possible
- Analog adjustable sensitivity (specific resistance of the liquid)
- Analog adjustable tripping delay time
- 1 yellow LED for indicating the relay state
- 1 green LED for indicating the applied control supply voltage
- 1 CO contact
- All terminals are removable
- Width 22.5 mm






Sensitivity	Tripping delay time	Rated control supply voltage U_s	Screw terminals	PU (UNIT, SET, M)	PS*	Weight per PU approx.
k Ω	s	V AC/DC	Order No. List Price \$ per PU			kg
2 ... 200	0.5 ... 10	24 ¹⁾ 24 ... 240	3UG45 01-1AA30 3UG45 01-1AW30	1 1	1 unit 1 unit	0.110 0.120

Sensitivity	Tripping delay time	Rated control supply voltage U_s	Spring-type terminals	PU (UNIT, SET, M)	PS*	Weight per PU approx.
k Ω	s	V AC/DC	Order No. List Price \$ per PU			kg
2 ... 200	0.5 ... 10	24 ¹⁾ 24 ... 240	3UG45 01-2AA30 3UG45 01-2AW30	1 1	1 unit 1 unit	0.110 0.120



For level monitoring sensors see page 11/56

¹⁾ The rated control supply voltage and the measuring circuit are not electrically isolated.

Selection and ordering data

Version	Assignment Cable	Elec- trode	Application	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	Weight per PU approx. kg
Level monitoring sensors (essential accessory)								
 3UG32 07-3A	Three-pole wire electrodes 500 mm long, with Teflon insulation (PTFE), screw-in gland width A/F 22, 3/8 inch thread, PVC connecting cable, 3 x 0.5 mm ² , 2 m long, max. operating temperature 90 °C, max. operating pressure 10 bar		Brown Center electrode White Not assign- Green able	The electrodes can be cut or bent to the required length before or after installation. The Teflon insulation must be removed over a length of approx. 5 mm. Applications: For 2-point liquid level control in an insulating tank. One electrode each for the min. and max. value and a common reference electrode.	3UG32 07-3A	1	1 unit	0.254
 3UG32 07-2A	Two-pole wire electrodes 500 mm long, with Teflon insulation (PTFE), screw-in gland width A/F 22, 3/8 inch thread, PVC connecting cable, 3 x 0.5 mm ² , 2 m long, max. operating temperature 90 °C, max. operating pressure 10 bar		Brown Not assign- White able	For installation see 3UG32 07-3A Application: For alarm indication in the event of overflow or low level and for 2-point liquid level control, when the conductive tank is used as the reference electrode.	3UG32 07-2A	1	1 unit	0.230
 3UG32 07-2B	Two-pole bow electrodes with Teflon insulation (PTFE), screw-in gland width A/F 22, 3/8 inch thread, PVC connecting cable, 3 x 0.5 mm ² , 2 m long, max. operating temperature 90 °C, max. operating pressure 10 bar		Brown Gland White Not assign- Green able	Thanks to the small space requirements due to lateral fitting, ideal for use in small containers and pipes, as a leak monitor and level monitor or for warning of water entering an enclosure.	3UG32 07-2B	1	1 unit	0.128
 3UG32 07-1B	Single-pole bow electrodes for lateral fitting with Teflon insulation (PTFE), screw-in gland width A/F 22, 3/8 inch thread, PVC connecting cable, 3 x 0.5 mm ² , 2 m long, max. operating temperature 90 °C, max. operating pressure 10 bar		Brown Gland White Elec- trode	As a max. value electrode for lateral fitting or for alarm indication in conductive tanks or pipes.	3UG32 07-1B	1	1 unit	0.122
 3UG32 07-1C	Single-pole rod electrodes for lateral fitting with Teflon insulation (PTFE), screw-in gland width A/F 22, 3/8 inch thread, PVC connecting cable, 3 x 0.5 mm ² , 2 m long, max. operating temperature 90 °C, max. operating pressure 10 bar		Brown Gland White Elec- trode	For high flow velocities or for intensively sparkling fluids.	3UG32 07-1C	1	1 unit	0.144

Technical specifications

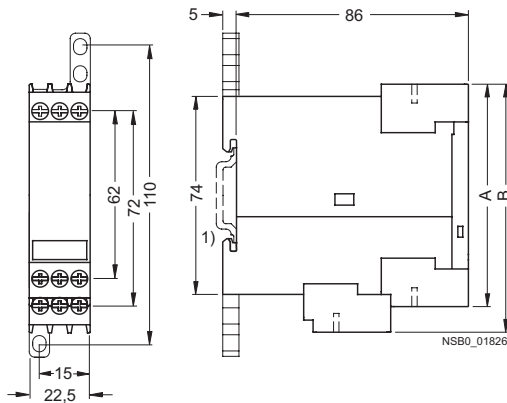
Type		3UG45 01-1AA30, 3UG45 01-2AA30	3UG45 01-1AW30, 3UG45 01-2AW30
General data			
Rated control supply voltage U_s	V AC/DC	24	24 ... 240
Rated frequency	Hz	50/60	
Operating range	V	20.4 ... 26.4	20.4 ... 264
Rated power, max. • At 24 V AC • At 240 V AC	VA VA	2 --	2 4
Width	mm	22.5	
Availability time after application of U_s	ms	500	
Response time once a switching threshold is reached	ms	Max. 300	
Adjustable delay time	s	0.5 ... 10	
Inlet or outlet monitoring function		UNDER/OVER selector switch at the front	
Mains buffering time, minimum	ms	200	
Rated insulation voltage U_i Degree of pollution 3, Overvoltage category III acc. to EN 60664-1	V	300	
Rated impulse withstand voltage	kV	4	
Permissible ambient temperature • During operation • During storage	°C °C	-25 ... +60 -40 ... +80	
EMC tests ¹⁾		IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4	
Degree of protection • Enclosure (acc. to EN 60529) • Terminals		IP40 IP20	
Vibration resistance acc. to IEC 60068-2-6		1 ... 6 Hz: 15 mm; 6 ... 500 Hz: 2 g	
Shock resistance acc. to IEC 60068-2-27		12 shocks (half-sine 15 g/11 ms)	
Connection type		 Screw terminals	
• Terminal screw • Solid • Finely stranded with end sleeve • AWG cables, solid or stranded • Tightening torque	mm ² mm ² AWG Nm	M3 (for standard screwdriver, size 2 and Pozidriv 2) 1 x (0.5 ... 4)/2 x (0.5 ... 2.5) 1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5) 2 x (20 ... 14) 0.8 ... 1.2	
Connection type		 Spring-type terminals	
• Solid • Finely stranded, with end sleeves acc. to DIN 46228 • Finely stranded • AWG cables, solid or stranded	mm ² mm ² mm ² AWG	2 x (0.25 ... 1.5) 2 x (0.25 ... 1.5) 2 x (0.25 ... 1.5) 2 x (24 ... 16)	
Measuring circuit			
Electrode current, max. (typ. 70 Hz)	mA	1	
Electrode voltage, max. (typ. 70 Hz)	V	15	
Sensor feeder cable	m	Max. 100	
Conductor capacity of sensor cable ²⁾	nF	Max. 10	
Adjustable sensitivity • Resistance	kΩ	2 ... 200	
Measuring accuracy	%	±20	
Repeat accuracy at constant parameters	%	±1	
Deviations for temperature fluctuations	%/°C	±1	
Control circuit			
Number of CO contacts for auxiliary contacts		1	
Load capacity of the output relay			
Conventional thermal current I_{th}	A	5	
Rated operational current I_o at • AC-15/24 ... 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	A A A A	3 1 0.2 0.1	
Minimum contact load at 17 V DC	mA	5	
Output relay with DIAZED fuse gL/gG operational class	A	4	
Electrical endurance AC-15	Million operating cycles	0.1	
Mechanical endurance	Million operating cycles	10	

¹⁾ Important: This is a Class A product. In the household environment this device may cause radio interference. In this case the user must introduce suitable measures.

²⁾ The sensor cable does not necessarily have to be shielded, but we do not recommend installing this cable parallel to the power supply lines. It is also possible to use a shielded cable, whereby the shield has to be connected to the M terminal.

Dimensional drawings

3UG45 01



Type	3UG45 01
	A B

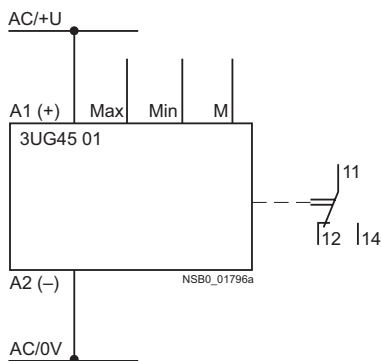
Removable terminals

Screw terminals	83	92
Spring-loaded terminals	84	94

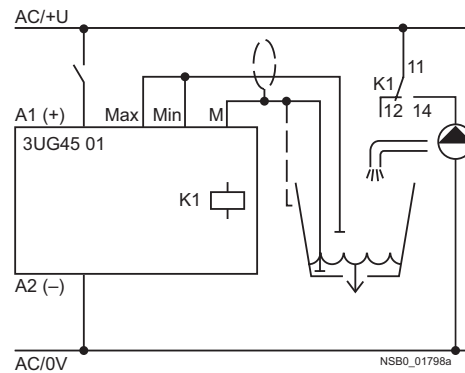
1) For standard mounting rail according to EN 60715.

Schematics

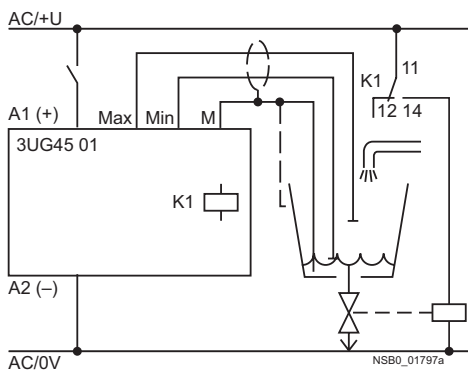
3UG45 01



Single-point control with inlet monitoring



Two-point control with outlet monitoring



Position of the terminals

A1+		M
MIN	MAX	A2-
12	11	14

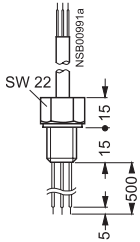
NSB0_011823

Technical specifications

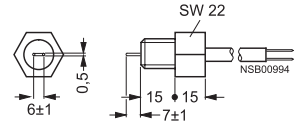
Type		3UG32 07-3A three-pole	3UG32 07-2A two-pole	3UG32 07-2B two-pole	3UG32 07-1B single-pole	3UG32 07-1C single-pole
Length	mm	500	500	--	--	--
Insulation	Teflon insulation (PTFE)	Yes	Yes	Yes	--	Yes
Installation		Vertical	Vertical	Lateral	Lateral	Lateral
Screw-in gland width A/F		22				
Thread	inch	R 3/8				
Connecting cable	mm ²	3 x 0.5, 2 m long				
Operating temperature	°C	90				
Operating pressure	bar	10				
Assignment						
Cable/Electrode	• Cable brown	Center electrode	Not assignable	Gland	Gland	Gland
	• Cable white	Not assignable	Not assignable	Not assignable	Electrode	Electrode
	• Cable green	Not assignable	--	Not assignable	--	--

Dimensional drawings

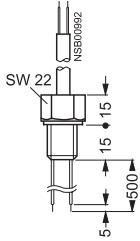
3UG32 07-3A
three-pole wire electrode



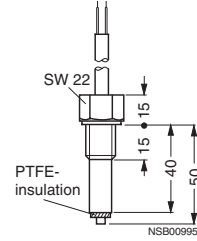
3UG32 07-1B
single-pole bow electrode



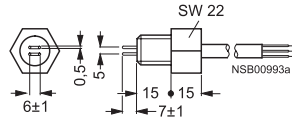
3UG32 07-2A
two-pole wire electrode



3UG32 07-1C
single-pole electrode, rugged version

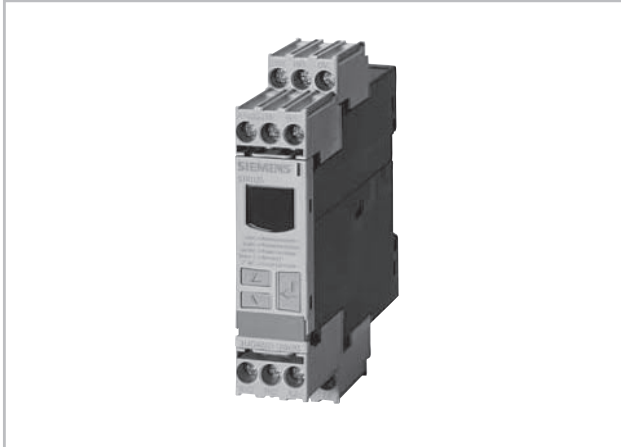


3UG32 07-2B
two-pole bow electrode



Speed monitoring

Overview



The 3UG46 51 monitoring relay is used together with a sensor to monitor drives for overspeed and/or underspeed.

Furthermore, this relay is ideal for all functions where a continuous pulse signal needs to be monitored (e. g. belt travel monitoring, completeness monitoring, passing monitoring, clock-time monitoring).


Application


- Slip or tear of a belt drive
- Overload monitoring
- Transport monitoring for completeness

Selection and ordering data

- Relay for speed monitoring in min^{-1} (rpm)
- Two- or three-wire sensor with mechanical or electronic switching output can be connected
- Two-wire NAMUR sensor can be connected
- Integrated sensor supply 24 V DC/50 mA
- Input frequency 0.1 ... 2200 pulses min^{-1} (0.0017 ... 36.7 Hz)
- With or without enable signal for the drive to be monitored



- Digital adjustable, with illuminated LCD
- Overshoot, undershoot or range monitoring
- Number of pulses per revolution can be adjusted
- Upper and lower threshold value can be adjusted separately
- Auto, manual or remote RESET options after tripping
- Permanent display of actual value and tripping state
- 1 CO contact
- All terminals are removable
- Width 22.5 mm

Measuring range	Hysteresis	ON-delay time	Tripping delay time	Pulses per revolution	Rated control supply voltage U_s AC/DC	Screw terminals 	PU (UNIT, SET, M)	PS*	Weight per PU approx.
rpm	rpm	s	s		V	Order No. List Price \$ per PU			kg
0.1 ... 2200	OFF, 0.1 ... 99.9	0 ... 900	0.1 ... 99.9	1 ... 10	24 ¹⁾ 24 ... 240	3UG46 51-1AA30 3UG46 51-1AW30	1 1	1 unit 1 unit	0.120 0.130

Measuring range	Hysteresis	ON-delay time	Tripping delay time	Pulses per revolution	Rated control supply voltage U_s AC/DC	Spring-type terminals 	PU (UNIT, SET, M)	PS*	Weight per PU approx.
rpm	rpm	s	s		V	Order No. List Price \$ per PU			kg
0.1 ... 2200	OFF, 0.1 ... 99.9	0 ... 900	0.1 ... 99.9	1 ... 10	24 ¹⁾ 24 ... 240	3UG46 51-2AA30 3UG46 51-2AW30	1 1	1 unit 1 unit	0.120 0.130

¹⁾ The rated control supply voltage and the measuring circuit are not electrically isolated.

Technical specifications

Type		3UG46 51-1AA30, 3UG46 51-2AA30	3UG46 51-1AW30, 3UG46 51-2AW30
General data			
Rated control supply voltage U_s	V AC/DC	24	24 ... 240
Rated frequency	Hz	50/60	
Operating range	V	20.4 ... 26.4	20.4 ... 264
Rated power, max.			
• At 24 V AC	VA	2.5	4
• At 240 V AC	VA	--	9
Width	mm	22.5	
RESET		Automatic/manual	
Availability time after application of U_s	ms	500	
Response time once a switching threshold is reached	ms	Max. 300	
Adjustable tripping delay time	s	0.1 ... 99.9	
Adjustable ON-delay time	s	1 ... 900	
Principle of operation		Closed-circuit principle, open-circuit principle	
NC/NO contact behavior		Adjustable	
Mains buffering time, minimum	ms	10	
Rated insulation voltage U_i	V	300	
Degree of pollution 3, Overvoltage category III acc. to EN 60664-1			
Rated impulse withstand voltage	kV	4	
Permissible ambient temperature			
• During operation	°C	-25 ... +60 ¹⁾	
• During storage	°C	-40 ... +80	
EMC tests ²⁾		IEC 60947-1, IEC 61000-6-2, IEC 61000-6-4	
Degree of protection			
• Enclosure (acc. to EN 60529)		IP40	
• Terminals		IP20	
Vibration resistance acc. to IEC 60068-2-6		1 ... 6 Hz: 15 mm; 6 ... 500 Hz: 2 g	
Shock resistance acc. to IEC 60068-2-27		12 shocks (half-sine 15 g/11 ms)	
Connection type		 Screw terminals	
• Terminal screw		M3 (for standard screwdriver, size 2 and Pozidriv 2)	
• Solid	mm ²	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve	mm ²	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)	
• Tightening torque	Nm	0.8 ... 1.2	
Connection type		 Spring-type terminals	
• Solid	mm ²	2 x (0.25 ... 1.5)	
• Finely stranded, with end sleeves acc. to DIN 46228	mm ²	2 x (0.25 ... 1.5)	
• Finely stranded	mm ²	2 x (0.25 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)	
Measuring circuit			
Sensor supply			
• For three-wire sensor (24 V/0 V)	mA	Max. 50	
• For 2-wire NAMUR sensor (8V2)	mA	Max. 8.2	
Signal input			
• IN1	kΩ	16, three-wire sensor, pnp operation	
• IN2	kΩ	1, floating contact, 2-wire NAMUR sensor	
Voltage level			
• For level 1 at IN1	V	4.5 ... 30	
• For level 0 at IN1	V	0 ... 1	
Current level			
• For level 1 at IN2	mA	> 2.1	
• For level 0 at IN2	mA	< 1.2	
Minimum pulse duration of signal	ms	5	
Minimum interval between 2 pulses	ms	5	
Adjustable response value rpm	rpm	0.1 ... 2200	
Hysteresis	rpm	OFF and 0.1 ... 99.9	
Scale		1 ... 10	
Measuring accuracy	%	±10	
Repeat accuracy at constant parameters	%	±1	
Accuracy of digital display		±1 digit	

¹⁾ At a distance of > 1 cm to adjacent devices;
if butt-mounted: +50 °C.

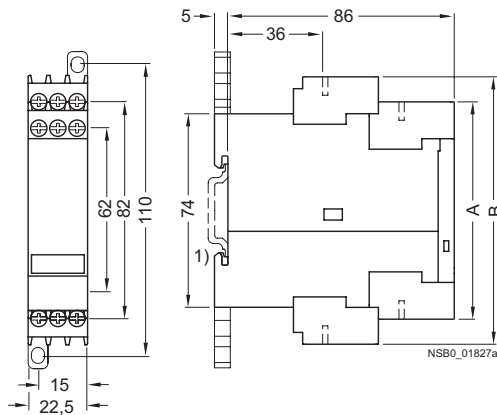
²⁾ Important: This is a Class A product. In the household environment this device may cause radio interference. In this case the user must introduce suitable measures.

Speed monitoring

Type	3UG46 51-1AA30, 3UG46 51-2AA30	3UG46 51-1AW30, 3UG46 51-2AW30
Control circuit		
Number of CO contacts for auxiliary contacts	1	
Load capacity of the output relay	5	
Conventional thermal current I_{th}	A	
Rated operational current I_e at		
• AC-15/24 ... 400 V AC/DC	A	3
• DC-13/24 V	A	1
• DC-13/125 V	A	0.2
• DC-13/250 V	A	0.1
Minimum contact load at 17 V DC	mA	5
Output relay with DIAZED fuse gL/gG operational class	A	4
Electrical endurance AC-15	Million operating cycles	0.1
Mechanical endurance	Million operating cycles	10

Dimensional drawings

3UG46 51



Type	3UG46 51	
	A	B

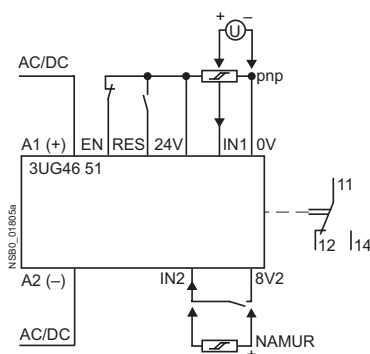
Removable terminal

Screw-type terminal	83	102
Spring-loaded terminal	84	103

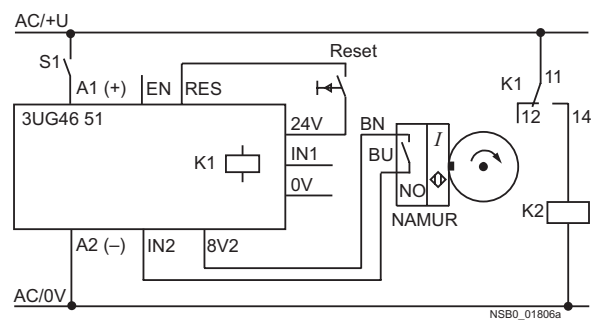
1) For standard mounting rail according to EN 60715.

Schematics

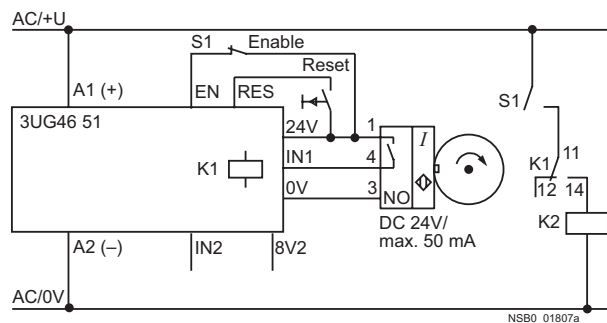
3UG46 51



Circuit example without enable input



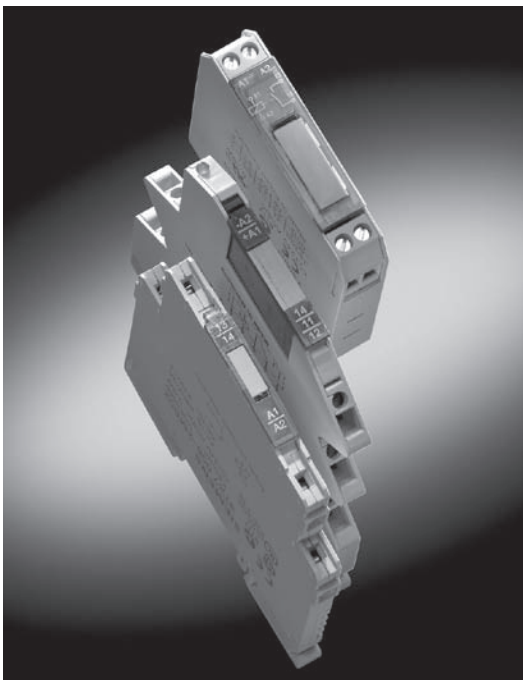
Circuit example with enable input



Position of the terminals

24V	IN1	0V
A1+	EN	RES
8V2	IN2	A2-
12	11	14

3TX0 interface relays are available in two basic versions. The 3TX7004/05 is just 6.2 mm wide: This series means that the interface relays take up a lot less space in the electrical cabinet. Then there is our 3TX7002/03 series: These devices are suitable for mounting in small electrical cabinets with a low depth and short distances between the mounting rails. Both series are available with an extensive range of input and output interfaces.



Your advantages: 3TX7002/03 and 3TX7004/05

- Operating range from 0.7 to 1.25 V_s at 24 V DC up to 60 °C
- Protective circuit is integrated in the input
- Connection comb and cable to connect voltages at the same potential
- Manual-0-automatic switch for easier commissioning

Your advantages: 3TX7014 and 3TX7015

- Plug-in relays that can be quickly replaced with preassembled wiring
- Conductors are introduced and clamped from the front – therefore shorter wiring times
- Tested, complete devices reduce installation times
- Individual relays are available as spare parts
- Relay version with hard-gold-plated contacts – therefore achieving a high contact reliability

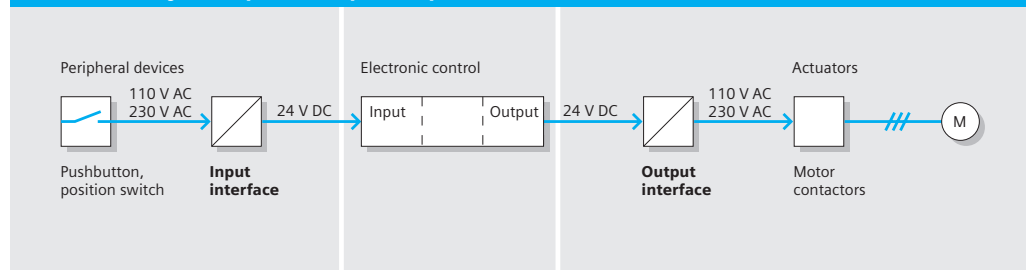
Applications:

- Electrically isolation
- Voltage conversion – e.g. from 24 V DC to 230 V AC
- Signal amplification
- Contact multiplication
- General relay controls
- Overvoltage and EMC protection of controls

Engineering information:

When selecting the interface for rated control supply voltages of 110 V AC and 230 V AC, the maximum permissible cable length must be carefully observed. The special 3TX700- 05 relay can be used for longer cables.

Interface relays as input or output coupler



3TX70 interface relays

3TX701 Interface relay, plug-in						
Plug-in socket interface, complete with relay						
Contact	Rated control supply voltage V _s	Width	Hard-gold-plated	M-0-A switch	Order No.	List Price\$
1 NO	24 V DC	6.2 mm	–	–	3TX701□-1AM00	
1 CO	24 V DC	6.2 mm	–	–	3TX701□-1BM00	
	24 V AC/DC	6.2 mm	–	–	3TX701□-1BB00	
	115 V AC/DC	6.2 mm	–	–	3TX701□-1BE00	
	230 V AC/DC	6.2 mm	–	–	3TX701□-1BF00	
Plug-in socket interface relay, complete with relay and hard-gold-plated contacts						
1 CO	24 V DC	6.2 mm	yes	–	3TX701□-1BM02	
	24 V AC/DC	6.2 mm	yes	–	3TX701□-1BB02	
	115 V AC/DC	6.2 mm	yes	–	3TX701□-1BE02	
	230 V AC/DC	6.2 mm	yes	–	3TX701□-1BF02	
Accessories						
Connecting comb, 16 pin					3TX7014-7AA00	
Potential isolation plate					3TX7014-7CE00	

Screw Terminal 4

Spring-type Terminal 5

3TX700 relay interfaces, cannot be plugged-in						
3TX7004 05 – output interface with relay output						
Contact	Rated control supply voltage	Width	Hard-gold-plated	M-0-A switch	Order No.	List Price \$
1 CO	24 V AC/DC	6.2 mm	–	–	3TX700□-1LB00	
			yes	–	3TX700□-1LB02	
		12.5 mm	–	yes	3TX7004-1BB10	
	230 V AC/DC	6.2 mm	–	–	3TX700□-1LF00	
		12.5 mm	–	–	3TX7004-1BF05 ¹⁾	
1 NO	24 V AC/DC	6.2 mm	–	–	3TX700□-1MB00	
	230 V AC/DC	6.2 mm	–	–	3TX700□-1MF00	
3TX7004 05 – input interface with relay output						
1 NO	230 V AC/DC	6.2 mm	yes	–	3TX700□-2MF02	
	110 V AC/DC	6.2 mm	yes	–	3TX7004-2ME02	
	24 V AC/DC	6.2 mm	yes	–	3TX700□-2MB02	

Screw Terminal 4

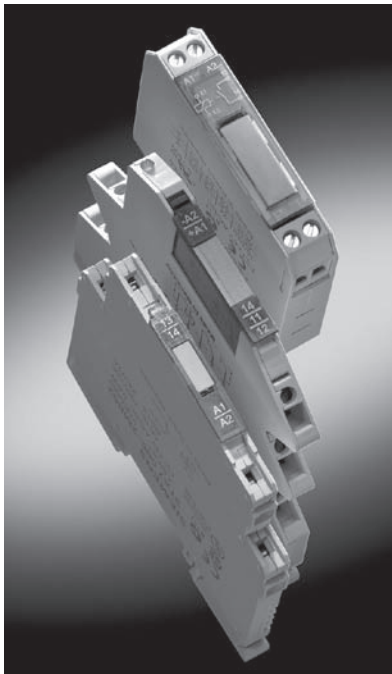
Spring-type Terminal 5

3TX7002 03 – for low heights between tiers – output interface with relay output						
Output	Voltage	Width	Hard-gold-plated		Order No.	List Price \$
1 NO	24 V AC/DC	11.5 mm	–		3TX700□-1AB00	
		11.5 mm	yes		3TX700□-1AB02	
1 CO	24 V AC/DC	17.5 mm	–		3TX700□-1BB00	
	230 V AC/DC	17.5 mm	–		3TX7002-1BF00	
2 NO	24 V AC/DC	22.5 mm	–		3TX700□-1CB00	
2 CO	24 V AC/DC	22.5 mm	yes		3TX700□-1FB02	
3TX7002 03 – input interface with relay output						
1 NO	230 V AC/DC	11.5 mm	–		3TX700□-2AF00	
	230 V AC/DC	11.5 mm	–		3TX7002-2AF05	
	110 V AC/DC	11.5 mm	–		3TX7002-2AE00	
	24 V AC/DC	11.5 mm	–		3TX7002-2AB00	
1 CO	230 V AC/DC	17.5 mm	yes		3TX7002-2BF02	
Accessories						
Connecting cable with 24 connecting points for 3TX70					3TX7004-8BA00	
Connecting comb with 24 connecting points for 3TX7004, 6.2 mm wide					3TX7004-8AA00	

¹⁾ For longer cables up to 350 m

Screw Terminal 2

Spring-type Terminal 3



Interface modules are available either with relays or semiconductors. Semiconductor interfaces offer some significant advantages: The electronic components are extremely reliable and have an extremely long service life (refer to the diagram below). The input interface combines the best of both worlds – improved technical features and a lower price. When considering output interfaces, the question of “relay or semiconductor” needs to be taken into account as well as the making/breaking capacity and the number of operating cycles. If a relay has to be replaced just once during the complete lifetime of a machine, then a semiconductor interface will already have paid for itself.

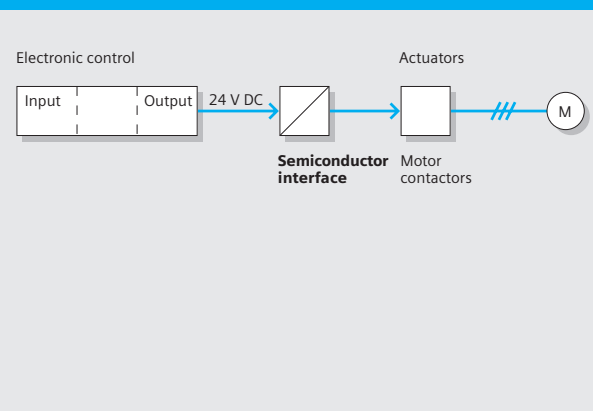
Your advantages:

- Favorably priced and reliable: Input interfaces with semiconductor output
- Graduated series of output interfaces with semiconductors
- Extremely long electrical life
- Extremely high contact reliability
- High DC making/breaking capacity
- Short switching times

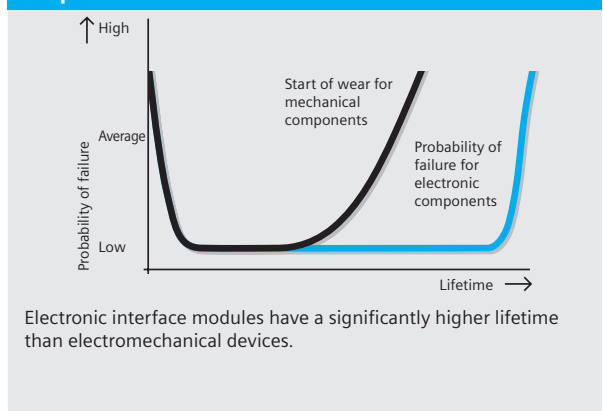
Applications:

- Providing electrical isolation, converting voltages
- Switching DC loads
- Switching capacitive loads
- High number of switching cycles
- Overvoltage and EMC protection of controls

Use of semiconductor interfaces



Comparison of lifetimes



3TX70 semiconductor interfaces

3TX70 semiconductor interfaces

3TX7004/05 – the narrow space saver – output interfaces with semiconductor output, 1 NO contact

Control supply voltage	Width	Max. switching current	Switching voltage	Min. load current	Short-time load capacity	M-0-A switch	Order No.	List Price \$
24 V DC	6.2 mm	0.5 A	≤ 48 V DC	–	1.5 A/20 ms	–	3TX700□-3AB04	
	6.2 mm	1.5 A	≤ 30 V DC	–	Short-circuit proof	–	3TX700□-3PB54	
	12.5 mm	5 A	≤ 30 V DC	0.5 A	Short-circuit proof	–	3TX700□-3AC04	
	12.5 mm	5 A	≤ 30 V DC	0.5 A	Short-circuit proof	yes	3TX700□-3AC14	
	12.5 mm	2 A	24–250 V AC	0.05 A	100 A/20 ms	–	3TX700□-3AC03	
110–230 V AC	6.2 mm	3 A	≤ 30 V DC	–	Short-circuit proof	–	3TX700□-3PG74	

Input interfaces with semiconductor output, 1 NO contact

110–230 V AC	6.2 mm	0.1 A	≤ DC 30 V	–	0.2 A/3 ms	–	3TX700□-4PG24	
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Screw Terminal **4**

Spring-type Terminal **5**

3TX7002 – for low tier heights – output coupler with semiconductor output, one NO contact

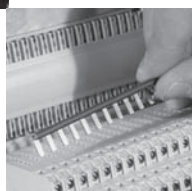
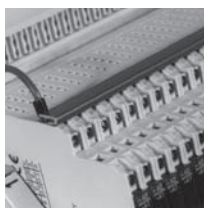
Control supply voltage	Width	Max. switching current	Switching voltage	Min. load current	Short-time load capacity	Order No.	List Price \$
24 V DC	12.5 mm	1.8 A	48–264 V AC	0.06 A	20 A/20 ms	3TX7002-3AB00	
24 V DC	11.5 mm	1.5 A	≤ 60 V DC	–	4 A/0.2 ms	3TX7002-3AB01	

Input interfaces with semiconductor output, 1 NO contact

110–230 V AC	12.5 mm	0.1 A	≤ 60 V DC	–	1 A/20 ms	3TX7002-4AG00	
24 V AC/DC	12.5 mm	0.1 A	≤ 30 V DC	–	1 A/20 ms	3TX7002-4AB00	

Accessories

Connecting cable with 24 connecting points for 3TX70	3TX7004-8BA00	
Connecting comb with 24 connecting points for 3TX7004, 6.2 mm wide	3TX7004-8AA00	



Using the accessories it is easy to insert a jumper between the same voltage levels.

General data					
Rated insulation voltage U_i (pollution degree 3)		V		300	
Safe isolation acc. to DIN VDE 0106 Part 101 between coil and contacts		AC V		up to 300	
Degree of protection		Connections		IP 20	
		Enclosure		IP 30	
Short-circuit protection (weld-free protection at $I_k \geq 1$ kA) Fuse links, utilisation category gL/gG		A		4	
Permissible ambient temperature		in operation	°C	-25 ... +60	
		when stored	°C	-40 ... +80	
Conductor cross-sections Screw terminals (for 3TX7 004): solid		mm ²		1 x (0.25 ... 4)	
finely stranded with or without end sleeves		mm ²		1 x (0.5 ... 2.5)	
Terminal screws				M 3	
Cage Clamp connections (for 3TX7 005): solid/finely stranded		mm ²		1 x (0.08 ... 2.5)	
finely stranded with end sleeve		mm ²		1 x (0.25 ... 1.5)	
Control circuit					
Working range		at DC 17 to 40 V at $U_s =$ AC/DC 24 V at $U_s =$ AC/DC 110 and 230 V		– 0.7 to 1.25 x U_s 0.8 to 1.1 x U_s	
Power consumption U_s				approx. 0.5 W/channel; 3TX7 00...05: 1 W for DC/6 VA for AC	
Permissible residual current of the electronics (with 0 signal)		Overall width 6.2 mm	mA	$U_s = 24$ V; 2	
		Overall w. from 12.5 mm	mA	$U_s > 24$ V; 0.5	
exception: 3TX7 00.-1LH00			mA	2.5	
3TX7 00.-1BF05			mA	1.5	
				5 ($U_s =$ AC 230 V)	
				0.5 ($U_s =$ DC 230 V)	
Operating times at U_s					
ON-delay			ms	< 8	
OFF-delay			ms	< 15	
Status indication				Yellow LED	
Max. permissible cable lengths (min. cross-section: 0.75 mm ²)					
				3TX7 00.-1.F00 -2ME02 -2MF02	3TX7 00.-1.B... -2MB02
				3TX7 00.-1.H0.	3TX7 00.-1BF05
		AC	m	40	350
		DC	m	2000	2000
				400	on request
				2000	350
					2000
Load side					
Rated operational current ¹⁾ Conventional thermal current I_{th}		A		3TX7 00.-1A/-1B/-1C/-1H/-1G	3TX7 00.-1.L/-1.M
Rated operational current I_o acc. to utilisation category (DIN VDE 0660)				6	6
				AC-15	DC-13
				AC-15	DC-13
at 24 V		A		3	1.0
110 V		A		3	0.2
230 V		A		3	0.1
Switching current with resistive load acc. to DIN VDE 0435 (relay standard) and DIN VDE 0660				AC-12	DC-12
at 24 V		A		6	6
110 V		A		6	6
230 V		A		6	6
				0.3	0.3
				0.2	0.2
Min. contact loading for 3TX7 00.-1...0/5				AC/DC 17 V, 5 mA	AC/DC 17 V, 5 mA
Min. contact loading for 3TX7 00.-1...02 (hard gold-plated)				AC/DC 1 V, 0.1 mA	AC/DC 1 V, 0.1 mA
Output limit for hard gold-plating				30 V/20 mA	30 V/20 mA
Switching voltage				AC/DC 17 to 250 V	AC/DC 17 to 250 V
Mechanical endurance				20 x 10 ⁶ operating cycles	20 x 10 ⁶ operating cycles
Electrical endurance at I_o				1 x 10 ⁵ operating cycles	0.5 x 10 ⁵ operating cycles
Operating frequency		1/h		5000 operating cycles	5000 operating cycles

Note: The service life of the coupling relays can be increased by connecting inductive loads.

1) Capacitive loads can result in micro-welding at the contacts.

Function Relays, Interfaces and Converters

Coupling Relays and Interfaces

SIRIUS
RELAYS

3TX7 004/005 relay and semiconductor interfaces

Technical data

General data

Rated insulation voltage U_i (pollution degree 3)	V	300
Safe isolation acc. to DIN VDE 0884	V	up ... 300
Permissible ambient temperature	in operation when stored	°C °C
		–20 ... +60 –40 ... +80
Conductor cross-sections		
Screw terminals (for 3TX7 004):		
solid	mm ²	1 x (0.25 ... 4)
finely stranded with or without end sleeves	mm ²	1 x (0.5 ... 2.5)
Terminal screws		M 3
Cage Clamp connections (for 3TX7 005):		
solid/finely stranded	mm ²	1 x (0.08 ... 2.5)
finely stranded with end sleeve	mm ²	1 x (0.25 ... 2.5)

Type	3TX7 004-/ 3TX7 005-	3AB04/ 4AB04	3AC.4	3AC03	3PB54	4PG24
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Control circuit

Working range	V	11 ... 30 DC	11 ... 30 DC	11 ... 30 DC	11 ... 30 DC	110 ... 230 AC/DC
Power consumption	at 24 V DC AC 230 V	W W	≤ 0.5 –	≤ 0.5 –	≤ 0.25 –	≤ 0.2 –
Release voltage	V	6	5	6	9	20
Permissible residual current of the electronics (with 0 signal)	mA	2.3	2.6	1.5	1.5	0.4
Operating times						
ON-delay	ms	2.5	0.3	10	0.3	1
OFF-delay	ms	8	4	10	0.3	6
Status indication		Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
Max. permissible cable lengths (min. cross-section: 0.75 mm ²)	m	1700	2000	2000	2000	40

Type	3TX7 004-/ 3TX7 005-	3P.74	3PB41	3RB43	
Working range	V	110 ... 230 AC/DC	11 ... 30 DC	18 ... 30 DC	
Power consumption	at 24 V DC AC 230 V	W W	– ≤ 1.5	≤ 0.5 –	≤ 0.3 –
Release voltage	V	25	5	12	
Permissible residual current of the electronics (with 0 signal)	mA	1	1.5	4	
Operating times					
ON-delay	ms	1.5	4	0.2	
OFF-delay	ms	75	6	10	
Status indication		Yellow LED	Yellow LED	Yellow LED	
Max. permissible cable lengths (min. cross-section: 0.75 mm ²)	m	40	2000	2000	

Technical data

Type	3TX7 004-/ 3TX7 005-	3AB04/ 4AB04	3AC.4	3AC03	3PB54
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Load side

Switching voltage	V	≤ DC 48	≤ DC 30	AC 24 ... 250	≤ DC 30
Switching current	A	0.5	5	2	1.5
Short-time load rating	A ms	1.5 20	Short-circuit proof ¹⁾	100 20	Short-circuit proof ²⁾
Contacts		1 NO transistor	1 NO transistor	1 NO Triac	1 NO transistor
Minimum load current	mA	–	500 ³⁾	50	–
Conductive voltage drop	V	≤ 1	≤ 0.5	≤ 1.6	≤ 0.5
Residual current of the electronics (with 0 signal)	mA	< 0.1	< 0.1	< 6	< 0.1
Operating frequency with resistive load	Hz	50	50	1	500

Type	3TX7 004-/ 3TX7 005-	3P.74	3PB41	3RB43	4P.24
Switching voltage	V	≤ DC 30	≤ DC 200	AC 24 ... 250	≤ DC 30
Switching current	A	3	0.75	0.5	0.1
Short-time load rating	A ms	Short-circuit proof ²⁾	3 2	0.8 3	0.2 3
Contacts		1 NO transistor	1 NO transistor	1 NO Triac	1 NO transistor
Minimum load current	mA	–	–	10	–
Conductive voltage drop	V	≤ 0.5	≤ 2	≤ 1.5	≤ 1.5
Residual current of the electronics (with 0 signal)	mA	≤ 0.1	≤ 0.1	≤ 1	≤ 0.1
Operating frequency with resistive load	Hz	10	50	50	500

1) The semiconductor output switches off in the case of a short-circuit or overload. Before the device can be operated again, it must be disconnected briefly from the supply voltage.

2) The current is limited by the semiconductor output in the case of a short-circuit or overload.

3) Below the minimum load current, the built-in semiconductor detects a wire-break in the load circuit. To reset this, the control circuit must be briefly deactivated.

Application

DC operation

DIN VDE 0110 Part 1,
DIN VDE 0435, DIN VDE 0660
and EN 50 005
Optocoupler: DIN VDE 0884
DIN VDE 0411 Part 500,
IEC 61 131-2 (programmable
logic controllers)

In the case of coupling elements in double-tier design, the terminals are arranged in two tiers and the devices are extremely narrow. Connection technique: Screw terminal or Cage Clamp. Versions with Manual-O-Automatic switches are available for test purposes.

The input and output coupling devices differ with regard to the location of the connections and LEDs. For equipment identification purposes, each coupling device has a blank legend plate.

Similar to the technical data of the solid-state systems, the devices have a low power consumption.

Optocouplers switch by means of semiconductors. These are not subject to wear, so welding of contacts is not possible.

The 6.2 mm wide optocouplers have an opening on the right-hand side of the enclosure. They can be – like the relay couplers – mounted in a row without gaps.

Functions

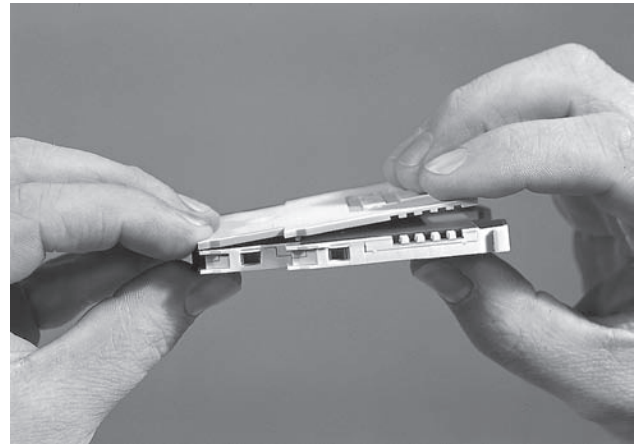
Surge suppression

The coupling devices are tested with 1×10^5 operating cycles in AC-15 operation with the values specified in the technical data. The service life of the relay connector can be increased by connecting inductive loads.

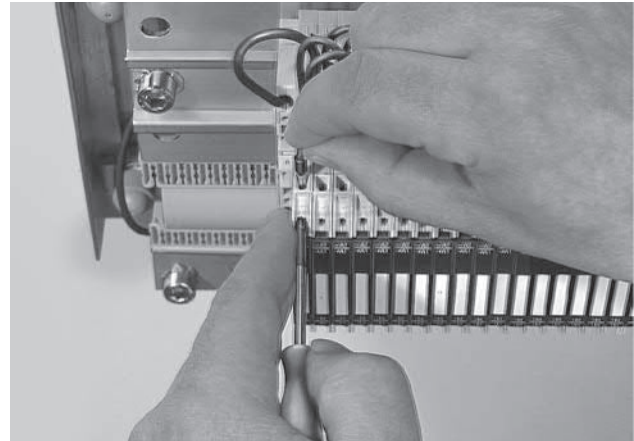
Note

When capacitive loads are switched in the absence of components (series resistors) that limit the brief peak currents, this can cause micro welding of the relay contacts.

To guarantee shock hazard protection in modules of the 6.2 mm series with enclosure opening (e. g. 3TX7 004-3AB04), the individual module or the final module in a row must be fitted with an end plate.



Connecting a cable to the Cage Clamp



Construction

Mounting instructions

Snap-on mounting onto horizontal and vertical standard rails is possible. For a vertical rail and closely mounted devices, the permissible ambient temperature is $T_u = 40^\circ\text{C}$. Any service position is possible.

When the permissible upper limit of rated control supply voltage is fully exploited as well as the highest permissible ambient temperature, and the device operates with a continuous 24-hour (100%) ON period, it is recommended that no devices of a similar type or other devices with a high external temperature are mounted adjacently without appropriate gaps; otherwise the service life of the coupler can be reduced.

A gap of $> 10\text{ mm}$ on the left-hand and right-hand sides of the device reduces the risk of premature failure under these conditions of application.

Circuit diagrams

Terminal diagrams

Relay interfaces

Terminal designations according to EN 50 005

3TX7 002- . A . 00
-1AB02
-2AF05

-1B . 00

-1CB00

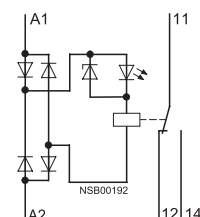
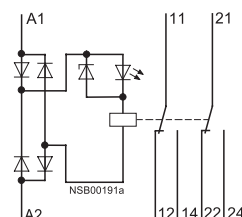
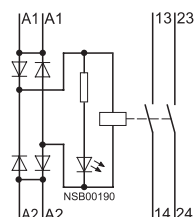
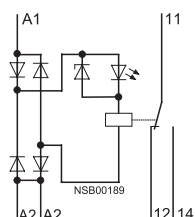
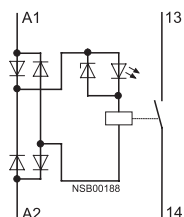
-1FB02

-2BF02

3TX7 003- . A . 00

-1B . 00

-1CB00



Semiconductor interfaces

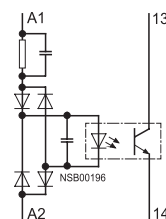
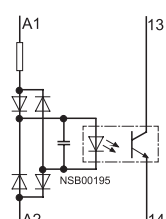
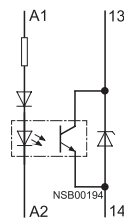
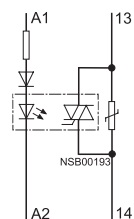
Terminal designations according to EN 50 005

3TX7 002-3AB00

-3AB01

-4AB00

-4AG00



Position of terminals

Relay interfaces

Output interfaces

3TX7 002-1AB0 .
3TX7 003-1AB00

-1B . 00
-1B . 00

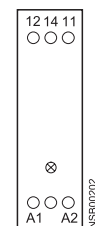
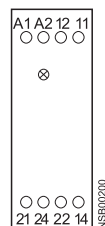
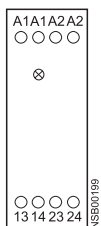
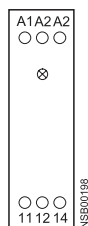
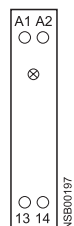
-1CB00
-1CB00

-1FB02

Input interfaces

3TX7 002-2A . 0 .
3TX7 003-2A . 0 .

-2BF02



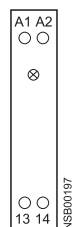
Semiconductor interfaces

Output interfaces

3TX7 002-3AB0 .

Input interfaces

3TX7 002-4A . 0 .



Function Relays, Interfaces and Converters

Coupling Relays and Interfaces

**SIRIUS
RELAYS**

3TX70 relay and semiconductor interfaces

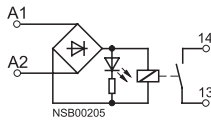
Circuit diagrams

Terminal diagrams

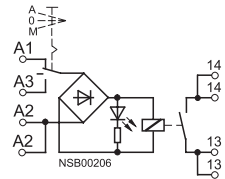
Relay interfaces

• Output interfaces

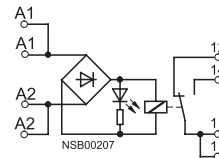
3TX7 00.-1M.00



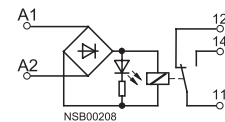
3TX7 00.-1AB10



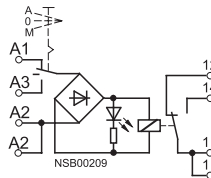
3TX7 00.-1BB00
-1BF05



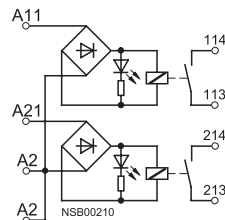
3TX7 00.-1L.0.



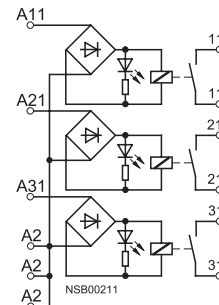
3TX7 00.-1BB10



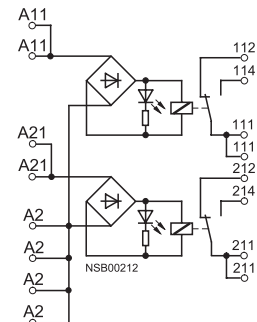
3TX7 00.-1CB00



3TX7 00.-1HB00

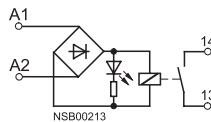


3TX7 00.-1GB00



• Input interfaces

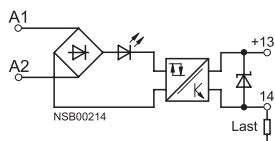
3TX7 00.-2M.02



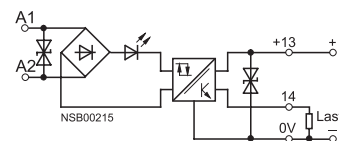
Semiconductor interfaces

• Output interfaces

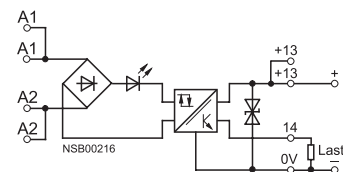
3TX7 00.-3AB04
-3PB41



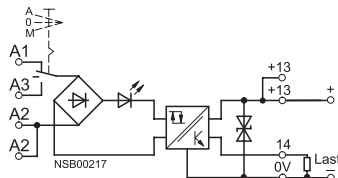
3TX7 00.-3PB54
-3PG74



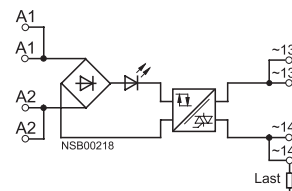
3TX7 00.-3AC04



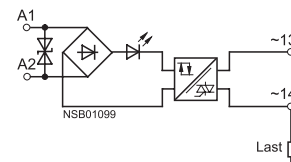
3TX7 00.-3AC14



3TX7 00.-3AC03

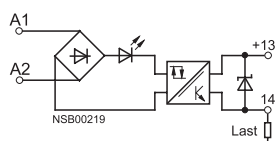


3TX7 00.-3RB43



• Input interfaces

3TX7 00.-4AB04
-4P.24



A = Automatic
0 = Neutral
M = Manual

Circuit diagrams

Position of terminals

Relay interfaces

• Output interfaces

3TX7 004

-1M . 00



-1L . 0 .



-1AB10



-1B . 0 .



-1BB10



-1CB00



-1HB00

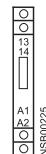


-1GB00



• Input interfaces

3TX7 004-2M...



3TX7 005

-1M . 00



-1L . 0 .



-1AB10



-1BB00



-1BB10



-1CB00



-1HB00



-1GB00



3TX7 005-2M...



Semiconductor interfaces

• Output interfaces

3TX7 004

-3AB04,

-3PB41



-3PB54,

-3PG74



-3AC04



-3AC14



-3AC03



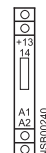
-3RB43



• Input interfaces

3TX7 004-4AB04

-4P . 24



3TX7 005

-3AB04,

-3PB41



-3PB54,

-3PG74



-3AC04



-3AC14



-3AC03



-3RB43



3TX7 005-4AB04

-4P . 24

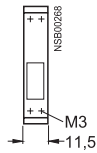


3TX70 relay and semiconductor interfaces

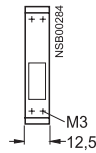
Dimension drawings

3TX7 002, 3TX7 003 interfaces in modular terminal block design

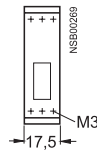
3TX7 00 .-1AB . . ,
3TX7 00 .-2A . . . ,
3TX7 002-3AB01



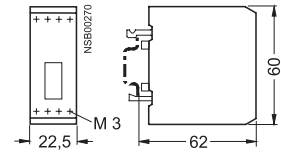
3TX7 002-3AB00,
3TX7 002-4A . . .



3TX7 00 .-1BB00,
3TX7 00 .-1BF00,
3TX7 002-2BF02

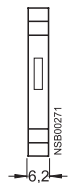


3TX7 00 .-1CB00,
3TX7 002-1BF02



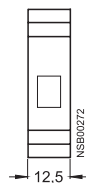
3TX7 004, 3TX7 005 interfaces in double-tier design

Relay coupling devices
3TX7 00 .-1MB00,
3TX7 00 .-1MF00,
3TX7 00 .-1L . 0 . . ,
3TX7 00 .-2M . . .

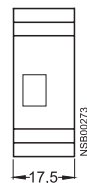


Relay coupling devices
3TX7 00 .-1AB10,
3TX7 00 .-1BB00,
3TX7 00 .-1BB10,
3TX7 00 .-1CB00,
3TX7 00 .-1BF05

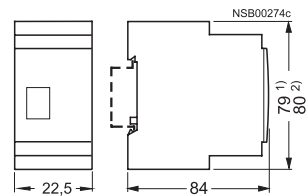
Semiconductor interfaces
3TX7 00 .-3AB04,
3TX7 00 .-4AB04,
3TX7 00 .-3PB . . ,
3TX7 00 .-3PG74,
3TX7 00 .-3RB43,
3TX7 00 .-4P . 24



Relay interfaces
3TX7 00 .-1HB00



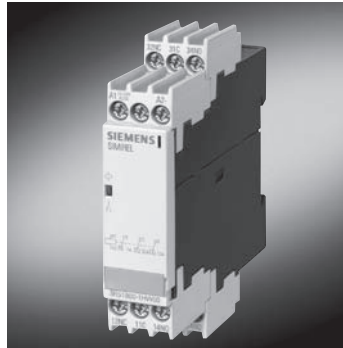
Relay interfaces
3TX7 00 .-1GB00



1) Dimension for 3TX7 004 interfaces (screw connections).

2) Dimension for 3TX7 005 interfaces (Cage Clamp connections).

The new 3RS18 interface relays set new standards: They have a wide-range voltage extending from 24 V AC DC to 240 V. This makes them absolutely unique in the interface market. All of these devices are accommodated in a well-proven, rugged 22.5 mm wide enclosure. Relays with 1, 2 and 3 changeover contacts are available in both screw and Cage Clamp terminal versions. Not only this, also in combination and wide-range voltage with hard-gold-plated contacts for an especially high contact reliability – even at low current levels. Thanks to the well-proven, rugged enclosure, you can enjoy the benefits of user-friendly connection systems, including Cage Clamp terminals – just the same as delete our time relays. 2 conductors can be connected at each terminal point.

**Your advantages:**

- New, worldwide: One device for all voltages
- Lower costs due to fewer versions
- User-friendly wiring
- Especially high contact reliability even at low currents

Applications:

- Everywhere that contacts which are electronics-compatible are required and where devices with wide-range voltage are used
- Thanks to the hard-gold-plated contacts, predestined for PLC I/O

3RS18 interface relays in a rugged, industrial enclosure 22.5 mm wide			
Rated control supply voltage V_s	Contact versions	Order No.	List Price \$
50 60 Hz			
Wide-range voltage 24–240 V AC/DC	2 CO	3RS18 00-□BW00	
	3 CO	3RS18 00-□HW00	
	3 CO hard-gold-plated	3RS18 00-□HW01	
	1 CO	3RS18 00-□AQ00	
Combination voltage 24 V AC/DC and 110–120 V AC	2 CO	3RS18 00-□BQ00	
	3 CO	3RS18 00-□HQ00	
	3 CO hard-gold-plated	3RS18 00-□HQ01	
	1 CO	3RS18 00-□AP00	
24 V AC/DC and 220–240 V AC	2 CO	3RS18 00-□BP00	
	3 CO	3RS18 00-□HP00	
	3 CO hard-gold-plated	3RS18 00-□HP01	

Screw Terminal 1

Spring-type Terminal 2

Overview

In automation and closed-loop control, working with analog signals is unavoidable. Interfaces of 0 to 10 V and 0/4 to 20 mA have become established in this field. Interface converters load the coupling function for analog signals on the input side as well as on the output side. They are indispensable

where analog values are processed with electronic controls. In the harsh industrial environment, signals often have to be transferred over large distances. Electrical isolation is necessary due to the various different power supplies. Potential differences and losses due to cable resistance must be

prevented. Electromagnetic disturbances and overvoltages can affect the signals especially at the input end and even destroy the analog modules. With regard to the output, short-circuit protection is of particular importance. The devices are EMC-tested acc. to EN 50081 (emission)

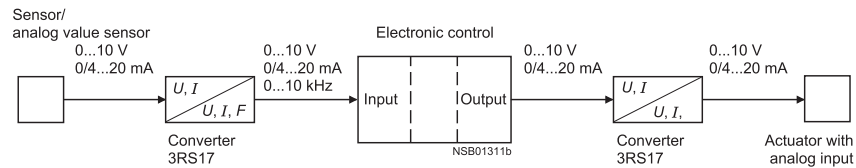
and EN 61000-6-2 (immunity). The analog signals correspond to IEC 60 381-1/2.

Application

Converters are used in analog signal processing for:

- Electrical isolation
- Conversion of normalised and non-normalised signals
- Amplification, impedance adjustment
- Conversion to frequency for processing by a digital input
- Overvoltage and EMC protection
- Short-circuit protection of the outputs

Example for application: Interface converter in analog signal evaluation



Selection and ordering data

Screw and Spring-type Terminal Connection

All converters with the exception of the passive individual interface converters are equipped with a yellow LED for indication of "Voltage applied".

Input	Output	Width	Supply voltage	Electrical isolation	Screw terminals Order No.	Spring-type terminals Order No.	List Price \$	Weight approx. kg
		mm	V					

Individual interface converters, active



0 ... 10 V	0 ... 10 V	6.2	AC/DC 24	2 way 3 way	3RS17 00-1AD00 3RS17 00-1AE00	3RS17 00-2AD00 3RS17 00-2AE00		0.03
0 ... 10 V	0 ... 20 mA	6.2	AC/DC 24	2 way 3 way	3RS17 00-1CD00 3RS17 00-1CE00	3RS17 00-2CD00 3RS17 00-2CE00		0.03
0 ... 10 V	4 ... 20 mA	6.2	AC/DC 24	2 way 3 way	3RS17 00-1DD00 3RS17 00-1DE00	3RS17 00-2DD00 3RS17 00-2DE00		0.03
0 ... 20 mA	0 ... 10 V	6.2	AC/DC 24	2 way 3 way	3RS17 02-1AD00 3RS17 02-1AE00	3RS17 02-2AD00 3RS17 02-2AE00		0.03
0 ... 20 mA	0 ... 20 mA	6.2	AC/DC 24	2 way 3 way	3RS17 02-1CD00 3RS17 02-1CE00	3RS17 02-2CD00 3RS17 02-2CE00		0.03
0 ... 20 mA	4 ... 20 mA	6.2	AC/DC 24	2 way 3 way	3RS17 02-1DD00 3RS17 02-1DE00	3RS17 02-2DD00 3RS17 02-2DE00		0.03
4 ... 20 mA	0 ... 10 V	6.2	AC/DC 24	2 way 3 way	3RS17 03-1AD00 3RS17 03-1AE00	3RS17 03-2AD00 3RS17 03-2AE00		0.03
4 ... 20 mA	0 ... 20 mA	6.2	AC/DC 24	2 way 3 way	3RS17 03-1CD00 3RS17 03-1CE00	3RS17 03-2CD00 3RS17 03-2CE00		0.03
4 ... 20 mA	4 ... 20 mA	6.2	AC/DC 24	2 way 3 way	3RS17 03-1DD00 3RS17 03-1DE00	3RS17 03-2DD00 3RS17 03-2DE00		0.03

Multi-range converters, selectable



0 ... 10 V	0 ... 10 V	6.2	AC/DC 24	2 way	3RS17 05-1FD00	3RS17 05-2FD00		0.03
0 ... 20 mA	0 ... 20 mA	17.5	AC/DC 24 to 240	3 way	3RS17 05-1FW00	3RS17 05-2FW00		0.1
4 ... 20 mA selectable	4 ... 20 mA selectable							
0 ... 10 V	0 ... 50 Hz	6.2	AC/DC 24	2 way	3RS17 05-1KD00	3RS17 05-2KD00		0.1
0 ... 20 mA	0 ... 100 Hz	17.5	AC/DC 24 to 240	3 way	3RS17 05-1KW00	3RS17 05-2KW00		0.1
4 ... 20 mA selectable	0 ... 1 kHz selectable							

Universal converters, selectable



0 ... 60 mV	0 ... 10 V	17.5	AC/DC 24	2 way	3RS17 06-1FD00	3RS17 06-2FD00		0.1
0 ... 100 mV	0 ... 20 mA			3 way	3RS17 06-1FE00	3RS17 06-2FE00		0.1
0 ... 300 mV	4 ... 20 mA		AC/DC 24 to 240	3 way	3RS17 06-1FW00	3RS17 06-2FW00		0.1
0 ... 500 mV	selectable							
0 ... 1 V								
0 ... 2 V	0 ... 10 mA							
0 ... 5 V	0 ... 20 mA							
0 ... 10 V	4 ... 20 mA							
0 ... 20 V	± 5 mA							
2 ... 10 V	± 20 mA							
0 ... 5 mA	selectable							

Multi-range converters, selectable, with Manual/Automatic switch and setting potentiometer as manual analog signal encoder



0 ... 10 V	0 ... 10 V	17.5	AC/DC 24	2 way	3RS17 25-1FD00	3RS17 25-2FD00		0.1
0 ... 20 mA	0 ... 20 mA		AC/DC 24 to 240	3 way	3RS17 25-1FW00	3RS17 25-2FW00		0.1
4 ... 20 mA selectable	selectable							

Input	Output	Width	Number of channels	Electrical isolation	Screw terminals Order No.	Spring-type terminals Order No.	List Price \$	Weight approx. kg
		mm						

Individual interface converters, passive



0/4 ... 20 mA	0/4 ... 20 mA	6.2	1-channel	2 way	3RS17 20-1ET00	3RS17 20-2ET00		0.05
0/4 ... 20 mA	0/4 ... 20 mA	12.5	1-channel	2 way	3RS17 21-1ET00	3RS17 21-2ET00		0.05
0/4 ... 20 mA	0/4 ... 20 mA	12.5	2-channel	2 way	3RS17 22-1ET00	3RS17 22-2ET00		0.05

Technical data

General data

Type		AC/DC 24 V	AC/DC 24 to 240 V
Supply voltage range		DC: 0.7 to 1.25 U_n AC: 0.8 to 1.2 U_n	DC: 0.7 to 1.1 U_n AC: 0.8 to 1.1 U_n
Rated power (own requirements)	W	Typically 0.3	Typically 0.75
Electrical isolation input/output		Active disconnector: 1500 V, 50 Hz, 1 min Passive disconnector: 500 V, 50 Hz, 1 min	4000 V, 50 Hz, 1 min
Rated insulation voltage Pollution degree 2, overvoltage category III acc. to DIN VDE 0110	V	50	300
Ambient temperature	for operation for storage	°C °C	– 20 ... + 60 – 40 ... + 85
Conductor cross-sections			
Screw connections			
solid	mm ²	1 x (0.25 ... 4)	
finely stranded with or without end sleeves	mm ²	1 x (0.5 ... 2.5)	
Terminal screws		M 3	
Cage Clamp terminals			
solid/finely stranded	mm ²	1 x (0.08 ... 2.5)	
finely stranded with end sleeve	mm ²	1 x (0.25 ... 1.5)	
Enclosure degree of protection	IEC 529	IP 30	
Terminal degree of protection	IEC 529	IP 20	
Permissible mounting position		any	
Mounting onto standard rails	EN 50 022	mm	35
Vibration performance	IEC 68-2-6		10–55 Hz/0.35 mm
Shock resistance	IEC 68-2-27		15 g/11 ms

Input

		Voltage inputs	Current inputs active	Current inputs passive
Input impedance		330 kΩ	100 Ω	–
Max. input voltage	AC/DC V	30	30	–
Response current	μA	–	–	100/250 (6.2 mm overall width)
Voltage drop		–	–	2.7 V at 20 mA

Output

		0 to 10 V	0/4 to 20 mA active	0 to 20 mA passive	Frequency
Output impedance	Ω	55	–	–	–
Max. output load	Ω	–	400	1000 at 20 mA 400 at 20 mA (6.2 mm overall width)	2400
Max. output current	mA	21	–	–	10
Short-circuit current	mA	40	–	Corresponds to the input current	15
Protection of the outputs		Short-circuit proof	Short-circuit proof	Short-circuit proof	Short-circuit proof
Max. overvoltage at output	AC/DC V	30	30	–	30

Accuracy

		Active disconnector (U, I)	Active disconnector (frequency)	Passive disconnector
Total error at 23 °C	%	0.1	0.1	–
Linearity error	%	0.02	0.02	–
Deviation due to ambient temperature		0 to 10 V: 1.5 mV/K 0/4 to 20 mA: 3 μA/K	0 to 50 Hz: 7.5 mHz/K 0 to 100 Hz: 15 mHz/K 0 to 1 KHz: 0.15 Hz/K 0 to 10 KHz: 1.5 Hz/K	Load < 600 Ω: < 50 ppm/K from measured value Load < = 600 Ω: < 175 ppm/K from measured value
Transmission error	%	–	–	0.1
Load error from measured value		–	–	0.06 %/100 Ω
Limit frequency 3 dB	Hz	30	30	50
Rise time (10 to 90%)	ms	10	10 + 1 periods	–
Settling time to 1% accuracy, typically	ms	30	30 + 1 periods	–
Residual ripple	mV _{rms}	< 5	–	< 8

Unless stated otherwise, the accuracy is specified with reference to the upper range limit

Configuration

Active interface converters

Active interface converters offer the widest application flexibility due to the use of an external supply voltage. Project engineering with active interface converters is easy, because

input and output resistances and voltage drops are balanced by the auxiliary power. They provide pure electrical isolation as well as conversion between the different signal

types or amplification. The loading on the encoder is negligible.

Passive interface converters

Passive interface converters do not require an external supply voltage. This advantage can only be utilised in the case of current signals that are transferred 1:1. Amplification or

conversion is not possible. The converters are used for clear electrical isolation of signals and for protecting the inputs and outputs. Passive disconnectors do not operate reac-

tion free, i.e. any load on the output affects the input signal to the same degree. When the passive converter is used, an analysis of the output power of the encoder and the input

resistance of the analog input must be performed. For pure currentis being used more and more.

Calculation aid for passive converters

⚠ Important:

When passive disconnectors are used, it is important to note that:

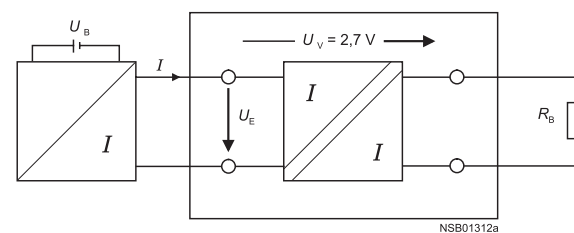
The current-driving voltage of the measuring transmitter U_E must be sufficient to drive the maximum current of 20 mA

through the passive disconnector with a voltage drop of $U_V = 2.7$ V and the resistive load R_B .

This means that:

$$U_B \geq U_E = 2.7 \text{ V} + 20 \text{ mA} \times R_B$$

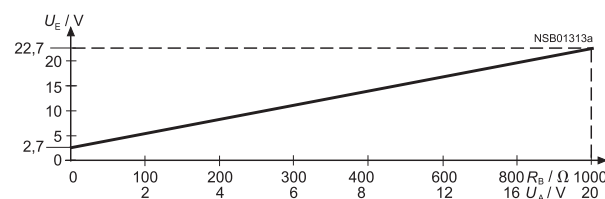
Voltage splitting with passive disconnectors



The following diagram shows the input voltage U_E as a function of the resistive load R_B taking into account the voltage drop U_V . If the resistive load is known, the minimum voltage that the current source has to produce in order to drive the maximum current of 20 mA via the passive disconnector and resistive load can be read off the Y-axis.

Input voltage

as a function of resistive load at $I_A = 20$ mA



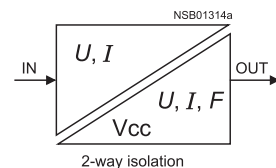
Current-carrying capacity of the outputs

A maximum output load is specified in the case of current signals. This resistance value specifies the maximum input resistance for the subsequent device for which the output of the converter is adequate.

For voltage signals, the maximum current that can be drawn from the output is the decisive factor.

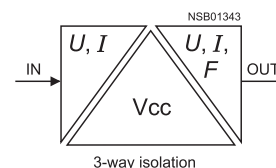
2-way isolation

In the case of 2-way isolation, the input is electrically isolated from the output. The "zero potential" for the supply voltage is the same as that on which the analog output signal is referenced.



3-way isolation

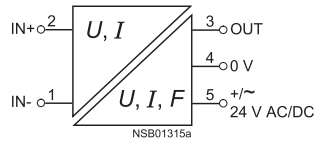
In the case of 3-way isolation, each circuit is electrically isolated from the others, i.e. the input, output and supply voltage have no common potential.



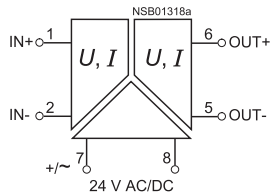
3RS17

Circuit diagrams

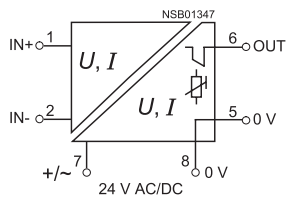
3RS17 00-...D..
3RS17 02-...D..
3RS17 03-...D..
3RS17 05-...D..



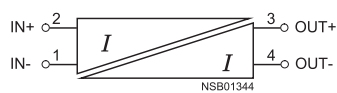
3RS17 06-...FE00



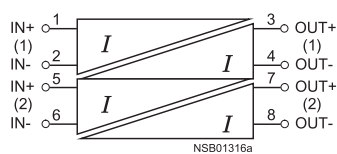
3RS17 25-...FD00



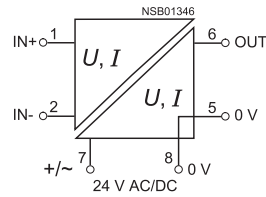
3RS17 20-...ET00



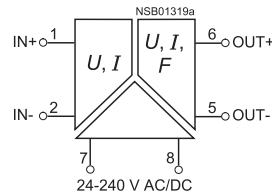
3RS17 22-...ET00



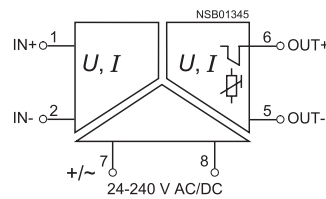
3RS17 06-...FD00



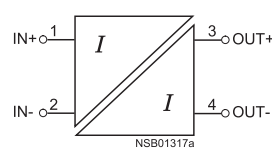
3RS17 0-...W00



3RS17 25-...FW00



3RS17 21-...ET00

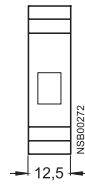


Dimension drawings

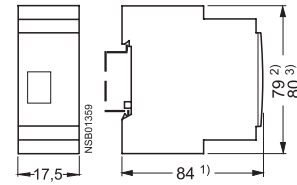
6.2 mm type:



12.5 mm type:



17.5 mm type:



- 1) Overall depth for 3RS17 25 is approx. 90 mm.
- 2) Dimension for screw connection.
- 3) Dimension for Cage Clamp connection.

Overview

Version

The 3TG10 contactors with 4 main contacts are available with screw-type terminals or with 6.3 mm to 0.8 mm tab connectors. The designs with screw-type terminals are suitable for use in any climate and safe from touch to DIN VDE 0106 Part 100.

The 3TG10 contactors have a compact design. Their overall width is 36 mm.

Application

They are suitable for use in household appliances as well as for distribution boards in offices and residential buildings, owing to their hum-free construction. They can further be used in all areas where there is only a limited amount of space available, e.g. in air conditioners, heating systems, pumps and fans - basically in all simple electrical controls.

AC and DC operation

EN 60 947-4-1
(VDE 0660 Part 102).

Surge suppression


The 3TG10 contactors are fitted with an integrated protective circuit for damping opening surges.

Overload and short-circuit protection

The 3UA7 overload relay can be used for overload protection (see NS E catalogue, available in German). This applies both for contactor mounting and for mounting as a single unit.


The data for short-circuit protection of the contactors without using an overload relay are provided in the technical data.

Selection and ordering data

Ratings Utilization category			Main contacts	Rated control supply voltage U_s	Order No.	List Price \$	Weight approx.	Pack
AC-1 maximum resistive load	Horsepower ratings of three-phase loads at 50 Hz 400 V	AC-3 maximum inductive current	Design 				kg	Units
A	kW	A	NO NC					

With screw connections, 4-pin for screwing and snapping onto 35 mm standard mounting rail · hum-free

• AC operation


	3TG10 ...0	20	5	8.4	4	–	230 V, 45–450 Hz 110 V, 45–450 Hz 24 V, 45–450 Hz	3TG10 10-0AL2 3TG10 10-0AG2 3TG10 10-0AC2	0.15	10
					3	1	230 V, 45–450 Hz 110 V, 45–450 Hz 24 V, 45–450 Hz	3TG10 01-0AL2 3TG10 01-0AG2 3TG10 01-0AC2	0.15	10

• DC operation

	20	5	8.4	4	–	DC 24 V	3TG10 10-0BB4	0.15	10
				3	1	DC 24 V	3TG10 01-0BB4		

With tab connectors 6.3 x 0.8 mm, 4-pin for screwing and snapping onto 35 mm standard mounting rail · hum-free

• AC operation

	3TG10 ...1	16	5	8.4	4	–	230 V, 45–450 Hz 110 V, 45–450 Hz 24 V, 45–450 Hz	3TG10 10-1AL2 3TG10 10-1AG2 3TG10 10-1AC2	0.14	10
					3	1	230 V, 45–450 Hz 110 V, 45–450 Hz 24 V, 45–450 Hz	3TG10 01-1AL2 3TG10 01-1AG2 3TG10 01-1AC2	0.14	10

• DC operation

	16	5	8.4	4	–	DC 24 V	3TG10 10-1BB4	0.14	10
				3	1	DC 24 V	3TG10 01-1BB4		

1) The links for paralleling can be reduced by one pole. The rated operational currents are valid for each pole. The links for paralleling are insulated.

3TG10 power relays

Technical data

General data

Mechanical endurance	operating cycles		3 mill.
Electrical endurance at I_e	operating cycles	AC-1 AC-3	0.1 million 0.4 million
Rated insulation voltage U_i (pollution degree 3)		V	400
Rated impulse withstand voltage U_{imp}		kV	4
Safe isolation acc. to DIN VDE 0106 Part 101 and A1 (draft 2/89) between coil and contacts		V	up to 300
Permissible ambient temperature	in operation ¹⁾ when stored	°C °C	-25 ... +55 -50 ... +80
Degree of protection acc. to IEC 60 947-1 and IEC 60 529 (VDE 0470 Part 1)			IP 00, coil system IP 20
Power consumption of the coils (with coil in cold state and $1.0 \times U_s$)			
	AC operation 45 – 450 Hz	VA	4.4
	p.f.		0.9 (hum-free)
	DC operation	W	4
Coil voltage tolerance			0.85 to $1.1 \times U_s$
Operating times (break-time = opening time + arcing time)			AC operation DC operation
	Closing	closing time opening time	NO ms NC ms
	Opening	opening time closing time	NO ms NC ms
	Arcing time		ms
Shock resistance			
rectangular pulse	AC and DC operation	g/ms	5.1/5 and 3.5/10
sine pulse	AC and DC operation	g/ms	7.9/5 and 5.2/10
Operating frequency z in operating cycles per hour			
Rated operation	No-load op. frequency	1/h	10000
	for AC-1	1/h	1000
	for AC-2	1/h	500
	for AC-3	1/h	1000

Short-circuit protection

Fuse links	NH	Type 3NA	
Utilisation category gL/gG	DIAZED	Type 5SB	
	NEOZED	Type 5SE	
acc. to IEC 60 947-4-1	Type of coordination "1"	A	25
(DIN VDE 0660 Part 102)	Type of coordination "2"	A	10
Miniature circuit-breaker	C-characteristic	A	10

Load ratings with AC

AC-1 utilisation category, switching resistive load			
Rated operational current I_e at 55 °C to 400 V ¹⁾			
with screw connection	A	20	
with tab connector	A	16	
Ratings U_e of three-phase loads p.f. = 1	V	400	230/220
with screw connection	kW	13	7.5
with tab connector	kW	10	6.0
Minimum conductor cross-section with $I_{e \text{ load}}$	mm ²	2.5	

1) If the three main conducting paths are loaded with 20 A and $I > 10$ A for the fourth conducting

path; the permissible ambient temperature is 40 °C.

Technical data

Load ratings with AC

AC-2 and AC-3 utilisation categories

Rated operational currents I_e up to 400 V

A

8.4

Ratings of motors with slipring or squirrel-cage rotor at 50 Hz and 60 Hz and at 400 V

kW

4

AC-5a utilisation category (permissible supply impedance: $\geq 0.5 \Omega$)

Switching gas discharge lamps

per main conducting path at 50 Hz 230 V

Uncorrected

Lead-lag

Rating per lamp

W

18

36

58

18

36

58

Rated operational current per lamp

A

0.37

0.43

0.67

2 x 0.11

2 x 0.21

2 x 0.32

Number of lamps

unit

43

37

24

2 x 81

2 x 42

2 x 28

Switching gas discharge lamps with correction, electronic ballast

per main conducting path at 50 Hz 230 V

Parallel correction

Electr. ballast, 1 lamp

Electr. ballast, 2 lamps

Rating per lamp

W

18

36

58

18

36

58

Capacitor

 μF

4.5

4.5

7

6.8

6.8

10

10

10

22

Rated operational current per lamp

A

0.11

0.21

0.32

0.10

0.18

0.27

0.18

0.35

0.52

Number of lamps

unit

15

15

10

39

39

26

2 x 26

2 x 26

2 x 1

AC-5b utilisation category, switching incandescent lamps

per main conducting path at 50 Hz 230 V

kW

1.6

Load ratings with DC

DC-1 utilisation category, switching resistive load ($\frac{L}{R} \leq 1 \text{ ms}$)Rated operational current I_e

Conducting paths connected in series

1

2

3

4

up to 24 V

A

16

16

18

20

60 V

A

6

16

18

20

110 V

A

2

6

16

20

220 V/240 V

A

0.8

1.6

6

20

DC-3 and DC-5 utilisation categories, shunt and series motors

 $(\frac{L}{R} \leq 15 \text{ ms})$ Rated operational current I_e

Conducting paths connected in series

1

2

3

4

up to 24 V

A

10

16

16

18

60 V

A

0.5

5

16

16

110 V

A

0.15

0.35

10

10

220 V/240 V

A

–

–

1.75

2

Conductor cross-sections for designs

with screw connections

Screw connection

Finely stranded with end sleeve (DIN 46 228, style A/D/C)

mm²

M3

Solid

mm²

2 x (0.75 to 2.5)

mm²

2 x (1 to 2.5)

1 x 4

with tab connectors

Finely stranded

6.3 to 1

mm²

0.5 to 1

When using push-on contact acc. to DIN 46 245/46 247

6.3 to 2.5

mm²

1 to 2.5

Ⓢ and Ⓢ ratings (screw connection)

Rated insulation voltage

AC

V

600

Conventional thermal current

Free air and enclosed

A

20

Maximum horsepower ratings

(Ⓢ and Ⓢ-approved values)

Ratings of three-phase motors

at 60 Hz

at 115 V

hp

1/2

200 V

hp

1

230 V

hp

1 1/2

460 V/575 V

hp

–

600 V

hp

–

3-phase

–

3

3

5

5

3TG10 power relays

Accessories

For contactor	Design	Order No.	List Price \$	Weight approx.	Pack
Type	Max. rated operational currents $I_e/AC-1$ (at 55 °C) of contactors A	Max. conductor cross-sections mm ²	PG 101	kg	Units

Links for paralleling (star jumpers)

• 3-pole without terminal ¹⁾²⁾

3TG10	16 Star jumpers can be reduced by one pole	—	3RT1 916-4BA31	0.004	1
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• 3-pole with terminal ¹⁾³⁾

3TG10	40	25	3RT1 916-4BB31	0.013	1
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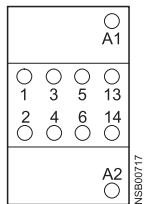
• 4-pole with terminal ¹⁾⁴⁾

3TG10	50	25	3RT1 916-4BB41	0.02	1
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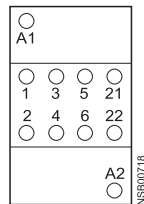
Circuit diagrams

Position of terminals

3TG10 10
1 NO

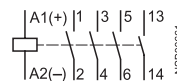


3TG10 01
1 NC

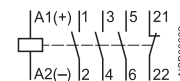


Internal circuit diagram

3TG10 10
1 NO
Ident. 10E



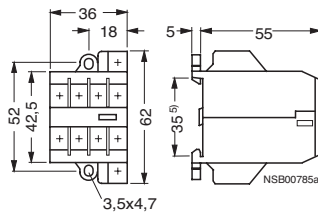
3TG10 01
1 NC
01E



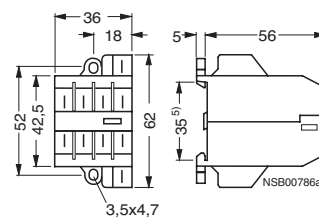
Dimension drawings

AC and DC operation

3TG10 ...0..
with screw connections

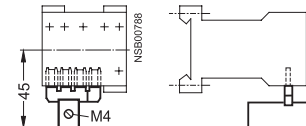


3TG10 ...1..
with tab connectors



Accessories for 3TG10

3RT19 16-4BB41 links for paralleling, 4-pole, with terminal



The links for paralleling can be reduced by one pole.

1) The links for paralleling can be reduced by one pole. The rated operational currents are valid for each pole. The links for paralleling are insulated.

2) Replacement type for 3TX44 90-2C.

3) Replacement type for 3TX44 90-2A.

4) Replacement type for 3TX44 90-2B.

5) Can be snapped onto 35 mm standard mounting rails.

Selection and ordering data

Siemens offers a wide range of plug-in relays to meet your industrial needs. Basic style relays are the most economical and are equipped with a mechanical flag indicator only. Premium style relays are full featured with LED and mechanical flag indication, push to test button and typically a latching hold down door which provides a method of activating the contacts without applying power to the coil. This feature is very handy during commissioning and troubleshooting. Premium Bifurcated style relays are ideal for low minimum holding current requirements on the contacts. Typical minimum holding current for bifurcated contacts is 3mA instead of 100mA.

Relays are divided up by the following functions for selection:

- Base style
- Contact Arrangement
- Contact Rating
- Coil Voltage
- Optional Features (Basic, Premium and Premium Bifurcated)



Square Base (Narrow)

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Premium Relay	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set	Panel Mount Adaptor 3TX7144-	DIN Rail Mount Adaptor 3TX7144-
SPDT	15	12VDC	3TX7110-5BB03C	3TX7110-5JB03	4E7	1L7	B	3L5	3L4
		24 VDC	3TX7110-5BC03C	3TX7110-5JC03	4E7	1L7	B	3L5	3L4
		24 VAC	3TX7110-5BC13C	3TX7110-5JC13	4E7	1L7	B	3L5	3L4
		120 VAC	3TX7110-5BF13C	3TX7110-5JF13	4E7	1L7	B	3L5	3L4
		240 VAC	—	3TX7110-5JG13	4E7	1L7	B	3L5	3L4



Square Base (Standard)

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Premium Relay	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set	Panel Mount Adaptor 3TX7144-	DIN Rail Mount Adaptor 3TX7144-
DPDT	12	24 VDC	3TX7111-3DC03C	3TX7111-3LC03	4E5	1L6	B	3L7	3L6
		24 VAC	3TX7111-3DC13C	3TX7111-3LC13	4E5	1L6	B	3L7	3L6
		120 VAC	3TX7111-3DF13C	3TX7111-3LF13	4E5	1L6	B	3L7	3L6
DPDT	15	12 VDC	3TX7114-5DB03C	3TX7114-5LB03	4E6	1L6	B	3L7	3L6
		24VDC	3TX7114-5DC03C	3TX7114-5LC03	4E6	1L6	B	3L7	3L6
		24VAC	3TX7114-5DC13C	3TX7114-5LC13	4E6	1L6	B	3L7	3L6
		120 VAC	3TX7114-5DF13C	3TX7114-5LF13	4E6	1L6	B	3L7	3L6
		240 VAC	3TX7114-5DH13C	3TX7114-5LH13	4E6	1L6	B	3L7	3L6
DPDT	10	12 VDC	3TX7115-5DB03C	—	4E4	1L12	A	—	—
		24VDC	3TX7115-5DC03C	3TX7115-5LC03	4E4	1L12	A	—	—
		24VAC	3TX7115-5DC13C	3TX7115-5LC13	4E4	1L12	A	—	—
		120 VAC	3TX7115-5DF13C	3TX7115-5LF13	4E4	1L12	A	—	—
DPDT Note: No Lock Down Door on Premium Style	20	12 VDC	—	3TX7119-5LB03	4E4	1L12	A	—	—
		24VDC	—	3TX7119-5LC03	4E4	1L12	A	—	—
		120 VAC	—	3TX7119-5LF13	4E4	1L12	A	—	—
		240 VAC	—	3TX7119-5LH13	4E4	1L12	A	—	—

Option	Basic	Premium
Mechanical Flag	✓	✓
Push To Test		✓
Lock Down Door		✓
LED		✓

Note: See page 11/90 for socket accessories.

3TX71 plug-in relays

• Revised •
12/10/14

Selection and ordering data



Square Base (Standard)

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Premium Relay	Premium Bifurcated	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set	Panel Mount Adaptor 3TX7144-	DIN Rail Mount Adaptor 3TX7144-
3PDT	15	24VDC	3TX7116-5FC03C	3TX7116-5NC03	—	4E8	1L9	A	1M3	1M4
		24VAC	3TX7116-5FC13C	3TX7116-5NC13	—	4E8	1L9	A	1M3	1M4
		120 VAC	3TX7116-5FF13C	3TX7116-5NF13	—	4E8	1L9	A	1M3	1M4
3PDT	10	24VDC	—	3TX7115-5NC03	—	4E4	1L12	A	—	—
		120 VAC	3TX7115-5FF13C	3TX7115-5NF13	—	4E4	1L12	A	—	—
4PDT	6A for Basic and Premium and 3A for Bifurcated	24VDC	3TX7111-3HC03C	3TX7111-3PC03	3TX7111-5PC03B	4E5	1L6	B	3L7	3L6
		24VAC	3TX7111-3HC13C	3TX7111-3PC13	—	4E5	1L6	B	3L7	3L6
		120 VAC	3TX7111-3HF13C	3TX7111-3PF13	3TX7111-5PF13B	4E5	1L6	B	3L7	3L6
		240 VAC	—	3TX7111-3PG13	—	4E5	1L6	B	3L7	3L6
4PDT	15	24VDC	3TX7117-5HC03C	3TX7117-5PC03	—	4E9	1L10	A	1M5	1M6
		24VAC	3TX7117-5HC13C	3TX7117-5PC13	—	4E9	1L10	A	1M5	1M6
		120 VAC	3TX7117-5HF13C	3TX7117-5PF13	—	4E9	1L10	A	1M5	1M6



Specialty Relay

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Premium Relay	Premium Bifurcated	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set	Panel Mount Adaptor 3TX7144-	DIN Rail Mount Adaptor 3TX7144-
DPDT Latching	16	24 VDC	3TX7137-5DC03	—	—	1E4	1L12	—	—	—
		120 VAC	3TX7137-5DF13	—	—	1E4	1L12	—	—	—

Option	Basic	Premium	Premium Bifurcated
Mechanical Flag	✓	✓	✓
Push To Test		✓	✓
Lock Down Door		✓	✓
LED		✓	✓

Note: See page 11/90 for socket accessories.

Selection and ordering data



Standard Octal Base

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Premium Relay	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set
DPDT	10	12 VDC	3TX7112-1DB03C	3TX7112-1LB03	4E2	1L14	A
		24VDC	3TX7112-1DC03C	3TX7112-1LC03	4E2	1L14	A
		24VAC	3TX7112-1DC13C	3TX7112-1LC13	4E2	1L14	A
		120 VAC	3TX7112-1DF13C	3TX7112-1LF13	4E2	1L14	A
		240 VAC	3TX7112-1DG13C	3TX7112-1LG13	4E2	1L14	A
3PDT	10	12 VDC	3TX7112-1FB03C	—	4E3	1L14	A
		24VDC	3TX7112-1FC03C	3TX7112-1NC03	4E3	1L14	A
		24VAC	3TX7112-1FC13C	3TX7112-1NC13	4E3	1L14	A
		120 VAC	3TX7112-1FF13C	3TX7112-1NF13	4E3	1L14	A
		240 VAC	—	3TX7112-1NG13	4E3	1L14	A



Hermetically Sealed

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set
DPDT	12	12 VDC	3TX7127-5HB00	3TX7144-4E2	1L12	A
		24 VDC	3TX7127-5HC00	3TX7144-4E2	1L12	A
		120 VAC	3TX7127-5HF10	3TX7144-4E2	1L12	A
4PDT	3	24VDC	3TX7127-3HC00	3TX7144-4E5	1L11	B
		24VAC	3TX7127-3HC10	3TX7144-4E5	1L11	B
		120 VAC	3TX7127-3HF10	3TX7144-4E5	1L11	B
4PDT	5	12 VDC	3TX7127-3HB03	3TX7144-4E5	1L11	B
		24VDC	3TX7127-3HC03	3TX7144-4E5	1L11	B
		120 VAC	3TX7127-3HF13	3TX7144-4E5	1L11	B

Note: See page 11/90 for socket accessories.

3TX71 plug-in relays

• Revised •
09/30/14

Selection and ordering data

Open Power Relays

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Metal Cover 7144-
SPST NO-DM	40	24VAC	3TX7130-0AC13	1M0
SPST NO-DM		120 VAC	3TX7130-0AF13	1M0
SPST NO-DM		240 VAC	3TX7130-0AH13	1M0
SPST NC-DM	40	120 VAC	3TX7130-0QF13	1M0
SPDT		24 VAC	3TX7130-0BC13	1M0
SPDT		120 VAC	3TX7130-0BF13	1M0
SPDT		240 VAC	3TX7130-0BH13	1M0
SPDT		277 VAC	3TX7130-0BS13	1M0
DPDT	40	24 VAC	3TX7130-0DC13	1M0
		120 VAC	3TX7130-0DF13	1M0
		240 VAC	3TX7130-0DH13	1M0
		277 VAC	3TX7130-0DS13	1M0
		12 VDC	3TX7130-0DB03	1M0
		24 VDC	3TX7130-0DC03	1M0
		48 VDC	3TX7130-0DD03	1M0
DPST NO	40	110 VDC	3TX7130-0DF03	1M0
		24 VAC	3TX7130-0CC13	1M0
		120 VAC	3TX7130-0CF13	1M0
		240 VAC	3TX7130-0CH13	1M0
		12 VDC	3TX7130-0CB03	1M0
		24 VDC	3TX7130-0CC03	1M0
DPDT (Mag Blowout)	40	48 VDC	3TX7130-0CD03	1M0
		120 VAC	3TX7130-0RF13	1M0
		12 VDC	3TX7130-0RB03	1M0
		24 VDC	3TX7130-0RC03	1M0
		48 VDC	3TX7130-0RD03	1M0
		110 VDC	3TX7130-0RF03	1M0



Enclosed Power Relays

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay
DPST-NO	30	24VAC	3TX7131-4CC13
		120 VAC	3TX7131-4CF13
		230 VAC	3TX7131-4CH13
DPDT	30 NO/ 3 NC	12 VDC	3TX7131-4DB03
		24 VDC	3TX7131-4DC03
		24VAC	3TX7131-4DC13
		120 VAC	3TX7131-4DF13
		230 VAC	3TX7131-4DH13



Note: See page 11/90 for socket accessories.

Selection and ordering data



Octal Based Timers

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Time Range	Function	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set	Panel Mount Adaptor 3TX7144-	DIN Rail Mount Adaptor 3TX7144-
DPDT	12	24 V AC/DC	OND-DFOB-24	0.1S - 10h	A, C	3TX7144-4E2	1L8	A	—	—
		120 V AC/DC	OND-DFOB-120	0.1S - 10h	A, C	3TX7144-4E2	1L8	A	—	—
		240 VAC	OND-DFOB-240	0.1S - 10h	A, C	3TX7144-4E2	1L8	A	—	—
DPDT	12	24V AC/DC	OFD-DFOB-24	0.1S - 10h	D, E	3TX7144-4E3	1L8	A	—	—
		120 V AC/DC	OFD-DFOB-120	0.1S - 10h	D, E	3TX7144-4E3	1L8	A	—	—
		240 VAC	OFD-DFOB-240	0.1S - 10h	D, E	3TX7144-4E3	1L8	A	—	—



Square Based Timers

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Time Range	Function	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set	Panel Mount Adaptor 3TX7144-	DIN Rail Mount Adaptor 3TX7144-
DPDT	12	24V AC/DC	OND-DFSB-24	0.1S - 10h	A, C	3TX7144-1E4	1L8	—	—	—
		120 V AC/DC	OND-DFSB-120	0.1S - 10h	A, C	3TX7144-1E4	1L8	—	—	—
		240 VAC	OND-DFSB-240	0.1S - 10h	A, C	3TX7144-1E4	1L8	—	—	—
DPDT	12	24V AC/DC	OFD-DFSB-24	0.1S - 10h	D, E	3TX7144-1E4	1L8	—	—	—
		120 V AC/DC	OFD-DFSB-120	0.1S - 10h	D, E	3TX7144-1E4	1L8	—	—	—
		240 VAC	OFD-DFSB-240	0.1S - 10h	D, E	3TX7144-1E4	1L8	—	—	—

Selecting Function	
Function for OND	SW I
On Delay	OFF
Interval	ON
Function for OFD	SW I
Off Delay	OFF
One Shot	ON

Selecting Time Range			
Time Range	SW II	SW III	SW IV
0.1s - 1 s	OFF	OFF	OFF
1s - 10s	OFF	OFF	ON
10s - 100s	OFF	ON	OFF
0.1m - 1m	OFF	ON	ON
1m - 10m	ON	OFF	OFF
10m - 100m	ON	OFF	ON
0.1h - 1h	ON	ON	OFF
1h - 10h	ON	ON	ON



Front Panel Timers

Contacts	Contact Rating (A)	Coil Voltage	Basic Relay	Time Range	Function	Uses Socket 3TX7144-	Uses Clip 3TX7144-	Socket Access Set	Panel Mount Adaptor 3TX7144-	DIN Rail Mount Adaptor 3TX7144-
DPDT	12	12-240V AC/DC	OFD-DFPR-00	0.1S - 9990h	A,B,C,D,E,F,G,H,I,J	3TX7144-4E3	1L25	—	—	—
SPDT		12-240V AC/DC	OND-DFPR-01	0.1S - 9990h	A,B,C,D,E,F,G,H,I,J	3TX7144-4E2	1L25	—	—	—
DPDT		12-240V AC/DC	OND-DFPR-02	0.1S - 9990h	A,B,C	3TX7144-4E2	1L25	—	—	—

Note: See page 11/90 for socket accessories.

Multifunction Timer Modes		
Function	Name	Description
A	On Delay (Power On)	When input voltage U is applied, timing delay t begins. Relay contacts R change state after the time delay is complete. Contacts R return to their shelf state when input voltage U is removed. Trigger switch is not used in this function.
B	Repeat Cycle (Starting Off)	When input voltage U is applied, time delay t begins. When time delay t is complete, relay contacts R change state for time delay t. This cycle will repeat until input voltage U is removed. Trigger switch is not used in this function.
C	Interval (Power On)	When input voltage U is applied, relay contacts R change state immediately and timing cycle begins. When time delay is complete, contacts return to shelf state. When input voltage U is removed, contacts will also return to their shelf state. Trigger switch is not used in this function.
D	Off Delay (S Break)	Input voltage U must be applied continuously. When trigger switch S is closed, relay contacts R change state. When trigger switch S is opened, delay t begins. When delay t is complete, contacts R return to their shelf state. If trigger switch S is closed before time delay t is complete, then time is reset. When trigger switch S is opened, the delay begins again, and relay contacts R remain in their energized state. If input voltage U is removed, relay contacts R return to their shelf state.
E	Retriggerable One Shot	Upon application of input voltage U, the relay is ready to accept trigger signal S. Upon application of the trigger signal S, the relay contacts R transfer and the preset time t begins. At the end of the preset time t, the relay contacts R return to their normal condition unless the trigger switch S is opened and closed prior to time out t (before preset time elapses). Continuous cycling of the trigger switch S at a rate faster than the preset time will cause the relay contacts R to remain closed. If input voltage U is removed, relay contacts R return to their shelf state.
F	Repeat Cycle (Starting On)	When input voltage U is applied, relay contacts R change state immediately and time delay t begins. When time delay t is complete, contacts return to their shelf state for time delay t. This cycle will repeat until input voltage U is removed. Trigger switch is not used in this function.
G	Pulse Generator	Upon application of input voltage U, a single output pulse of 0.5 seconds is delivered to relay after time delay t. Power must be removed and reapplied to repeat pulse. Trigger switch is not used in this function.
H	One Shot	Upon application of input voltage U, the relay is ready to accept trigger signal S. Upon application of the trigger signal S, the relay contacts R transfer and the preset time t begins. During time-out, the trigger signal S is ignored. The relay resets by applying the trigger switch S when the relay is not energized.
I	On/Off Delay (S Make/Break)	Input voltage U must be applied continuously. When trigger switch S is closed, time delay t begins. When time delay t is complete, relay contacts R change state and remain transferred until trigger switch S is opened. If input voltage U is removed, relay contacts R return to their shelf state.
J	Memory Latch (S Make)	Input voltage U must be applied continuously. Output changes state with every trigger switch S closure. If input voltage U is removed, relay contacts R return to their shelf state.

Socket Accessories

Access. Series	MOV	MOV	R/C	R/C	Diode
	24VAC/DC	120VAC/DC	6-24VAC/DC	110-240VAC/DC	6-250VDC
A	3TX7144-H1	3TX7144-H20	3TX7144-H4	3TX7144-H5	3TX7144-H6
B	3TX7144-H9	3TX7144-H17	—	—	3TX7144-H12

General specifications

Contact Characteristics		Units	3TX7109	3TX7110	3TX7111	3TX7111	3TX7111	3TX7111	3TX7111
Number and Type of Contacts			SPDT	SPDT	SPDT	DPDT	DPDT	4PDT	4PDT
Contact Material			Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy
Thermal (Carrying) Current		A	20	15	3 (Bifurcated)	12	3 (Bifurcated)	6	3 (Bifurcated)
Maximum Switching Voltage		V	300	300	300	300	300	300	300
Switching Current at Voltage		Resistive	16A @240V	15A @240V	3A @240V	—	3A @240V	6A @240V	3A @240V
		Resistive	16A @120V	15A @120V	—	12A @120V	3A @120V	6A @120V	3A @120V
		Resistive	16A @ 28	15A @ 28	—	12A @ 28	3A @ 30	6A @ 28	3A @ 30
		HP	1/2 @ 120VAC	1/2 @ 120VAC	—	1/3 @ 120VAC	1/16 @ 120VAC	1/3 @ 120VAC	1/16 @ 120VAC
		HP	1 @ 240VAC	1 @ 240VAC	—	—	—	1 @ 240VAC	—
Pilot Duty			B300	B300	—	B300	B300	B300	—
Minimum Switching Requirement		mA	100 @ 5VDC (.5W)	100 @ 5VDC (.5W)	3 @ 17VDC (.4W)	100 @ 5VDC (.5W)	3 @ 17VDC (.4W)	100 @ 5VDC (.5W)	3 @ 17VDC (.4W)
Coil Characteristics									
Voltage Range	AC	V	6...240	6...240	6...240	6...240	6...240	6...240	6...240
	DC	V	6...125	6...125	6...125	6...125	6...125	6...125	6...125
Operating Range	AC	%	85 to 110	85 to 110	85 to 110	85 to 110	85 to 110	85 to 110	85 to 110
	DC	%	80 to 110	80 to 110	80 to 110	80 to 110	80 to 110	80 to 110	80 to 110
Average Consumption	AC	VA	1.2	0.9	0.9	1.2	1.2	1.2	1.2
	DC	W	0.9	0.7	0.7	0.9	0.9	0.9	0.9
Drop-out Voltage Threshold	AC	%	15	15	15	15	15	15	15
	DC	%	10	10	10	10	10	10	10
Performance Characteristics									
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	100,000	100,000	100,000	200,000	200,000	200,000	200,000
Mechanical Life	Unpowered		10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Operating Time (response time)		ms	20	20	20	20	20	20	20
Dielectric Strength	Between Coil and Contact	V(rms)	2500	2500	2500	2500	2500	2500	2500
	Between Poles	V(rms)	1500	1500	1500	1500	1500	1500	1500
	Between Contacts	V(rms)	1500	1500	1500	1500	1500	1500	1500
Environment									
Product Certifications	Standard Version		UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS	UL,RoHS
Ambient Air Temperature around the Device	Storage	°C	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85
	Operational	°C	-40...+55	-40...+55	-40...+55	-40...+55	-40...+55	-40...+55	-40...+55
Vibration Resistance	Operational	g-n	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz
Shock Resistance		g-n	10	10	10	10	10	10	10
Degree of Protection			IP40	IP40	IP40	IP40	IP40	IP40	IP40
Weight		grams	36	29	29	36	36	36	36

Contact Characteristics		Units	3TX7112		3TX7114		3TX7115		3TX7116		3TX7117
Number and Type of Contacts			DPDT		3PDT		DPDT		3PDT		4PDT
Contact Material			Silver Alloy		Silver Alloy		Silver Alloy		Silver Alloy		Silver Alloy
Thermal (Carrying) Current		A	10		10		15		10		15
Maximum Switching Voltage		V	300		300		300		300		300
Switching Current at Voltage		Resistive	10A @240V		10A @240V		12A @277V		10A @277V		12A @277V
		Resistive	10A @120V		10A @120V		15A @120V		10A @120V		15A @120V
		Resistive	10A @ 28		10A @ 28		12A @ 28		10A @ 28		12A @ 28
		HP	1/3 @ 120VAC		1/3 @ 120VAC		1/2 @ 120VAC		1/3 @ 120VAC		1/2 @ 120VAC
		HP	1/2 @ 240VAC		1/2 @ 240VAC		1 @ 240VAC		1/2 @ 240VAC		3/4 @ 240VAC
Pilot Duty			B300		B300		B300		B300		B300
Minimum Switching Requirement		mA	100 @ 5VDC (.5W)		100 @ 5VDC (.5W)		100 @ 5VDC (.5W)		100 @ 5VDC (.5W)		100 @ 5VDC (.5W)
Coil Characteristics											
Voltage Range	AC	V	6...240		6...240		6...240		6...240		6...240
	DC	V	6...125		6...125		6...125		6...125		6...125
Operating Range	AC	%	85 to 110		85 to 110		85 to 110		85 to 110		85 to 110
	DC	%	80 to 110		80 to 110		80 to 110		80 to 110		80 to 110
Average Consumption	AC	VA	1.2		1.2		1.2		1.2		1.5
	DC	W	0.9		0.9		0.9		0.9		1.5
Drop-out Voltage Threshold	AC	%	15		15		15		15		15
	DC	%	10		10		10		10		10
Performance Characteristics											
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	200,000		200,000		100,000		100,000		200,000
Mechanical Life	Unpowered		10,000,000		10,000,000		10,000,000		10,000,000		10,000,000
Operating Time (response time)		ms	20		20		20		20		20
Dielectric Strength	Between Coil and Contact	V(rms)	2500		2500		2500		2500		2500
	Between Poles	V(rms)	1500		1500		1500		1500		2500
	Between Contacts	V(rms)	1500		1500		1500		1500		2500
Environment											
Product Certifications	Standard Version		UL,RoHS		UL,RoHS		UL,RoHS		UL,RoHS		UL,RoHS
Ambient Air Temperature	Storage	°C	-40...+85		-40...+85		-40...+85		-40...+85		-40...+85
around the Device	Operational	°C	-40...+55		-40...+55		-40...+55		-40...+55		-40...+55
Vibration Resistance	Operational	g-n	3, 10 - 55 Hz		3, 10 - 55 Hz		3, 10 - 55 Hz		3, 10 - 55 Hz		3, 10 - 55 Hz
Shock Resistance		g-n	10		10		10		10		10
Degree of Protection			IP40		IP40		IP40		IP40		IP40
Weight		grams	89		89		36		88		60

3TX71 plug-in relays

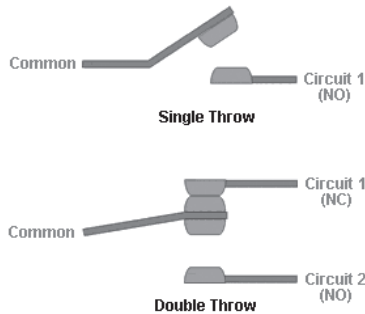
General specifications

Contact Characteristics		Units	3TX7119	3TX7127		3TX7130	
Number and Type of Contacts			DPDT	DPDT	4PDT	4PDT	All
Contact Material			Silver Alloy	Silver Alloy	Fine Silver	Silver Alloy	Silver Alloy
Thermal (Carrying) Current	A		20	12	3	5	40
Maximum Switching Voltage	V		600	300	300	300	600
Switching Current at Voltage	Resistive		20A @300V	12A @240V	3A @240V	12A @240V	40A @277V
	Resistive		—	12A @120V	3A @120V	—	—
	Resistive		20A @ 28	12A @ 28	3A @ 30	—	40A @ 28
	HP		1/3 @ 120VAC	1/3 @ 120VAC	1/16 @ 120VAC	—	—
	HP		1/2 @ 600VAC	1/2 @ 240VAC	1/10 @ 240VAC	—	—
	Pilot Duty		B600	B300	—	—	—
Minimum Switching Requirement	mA		100 @ 5VDC (.5W)	100 @ 5VDC (.5W)	10 @ 5VDC (.5W)	100 @ 5VDC (.5W)	1000 @ 12VAC/DC
Coil Characteristics							
Voltage Range	AC	V	6...240	6...240	6...240	6...240	6...600
	DC	V	6...125	6...125	6...125	6...125	6...600
Operating Range	AC	%	85 to 110	85 to 110	85 to 110	85 to 110	85 to 110
	DC	%	80 to 110	80 to 110	80 to 110	80 to 110	80 to 110
Average Consumption	AC	VA	2.75	1.2	1.2	1.2	10
	DC	W	2	0.9	0.9	0.9	4
Drop-out Voltage Threshold	AC	%	15	15	15	15	10
	DC	%	10	10	10	10	10
Performance Characteristics							
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	100,000	100,000	100,000	100,000	100,000
Mechanical Life	Unpowered		10,000,000	10,000,000	10,000,000	10,000,000	1,000,000
Operating Time (response time)		ms	20	20	20	20	30
Dielectric Strength	Between Coil and Contact	V(rms)	2000	1,500	1240	1240	2200
	Between Poles	V(rms)	2000	1,500	1240	1240	2200
	Between Contacts	V(rms)	1500	1500	500	500	1500
Environment							
Product Certifications	Standard Version		UL	UL,RoHS	UL,RoHS	UL,RoHS	UL
Ambient Air Temperature around the Device	Storage	°C	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85
	Operational	°C	-40...+55	-40...+55	-40...+70	-40...+70	-40...+70
Vibration Resistance	Operational	g-n	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz
Shock Resistance		g-n	10	10	10	10	—
Degree of Protection			IP40	IP67	IP67	IP67	Open
Weight		grams	88	130	45	45	227 to 312

Contact Characteristics		Units	3TX7131		3TX7132		3TX7136	3TX7137
Number and Type of Contacts			DPST-NO	DPDT	DPDT	SPDT	SPDT	DPDT
Contact Material			Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy	Silver Alloy
Thermal (Carrying) Current	A		30	30 DPDT-NO	3 DPDT-NC	30 SPDT-NO	3 DPDT-NC	12
Maximum Switching Voltage	V		600	300	300	300	300	300
Switching Current at Voltage	Resistive		20A @300V	30A @277V	3A @277V	30A @277V	3A @277V	12A @240V
	Resistive		—	—	—	—	—	16A @120V
	Resistive		20A @ 28	20A @ 28	3A @ 28	10A @ 28	3A @ 28	12A @ 28
	HP		1/3 @ 120VAC	1 @ 120VAC	—	1 @ 120VAC	—	1/2 @ 120VAC
	HP		1/2 @ 600VAC	3 @ 240VAC	—	2 @ 240VAC	—	1/3 @ 240VAC
	Pilot Duty		—	—	—	—	B300	B300
Minimum Switching Requirement	mA		500 @ 12VAC/DC	500 @ 12VAC/DC	500 @ 12VAC/DC	1000 @ 12VAC/5VDC	500 @ 12VAC/DC	100 @ 5VDC (.5W)
100 @ 5VDC (.5W)								
Coil Characteristics								
Voltage Range	AC	V	12...240	12...240	12...240	12...277	12...277	12...120
	DC	V	6...110	6...110	6...110	5...110	5...110	12...110
Operating Range	AC	%	85 to 120	85 to 120	85 to 120	85 to 120	85 to 120	85 to 110
	DC	%	75 to 120	75 to 120	75 to 120	75 to 120	75 to 120	80 to 110
Average Consumption	AC	VA	4	4	4	2.8	2.8	1.8
	DC	W	1.7	1.7	1.7	1	1	1.4
Drop-out Voltage Threshold	AC	%	10	10	10	10	10	15
	DC	%	10	10	10	10	10	10
Performance Characteristics								
Electrical Life (UL508)	Operations @ Rated Current	(Resistive)	100,000	100,000	100,000	100,000	100,000	100,000
Mechanical Life	Unpowered		5,000,000	5,000,000	5,000,000	10,000,000	10,000,000	5,000,000
Operating Time (response time)		ms	15	15	15	15	15	20
Dielectric Strength	Between Coil and Contact	V(rms)	4000	4000	4000	2500	2500	1500
	Between Poles	V(rms)	2000	2000	2000	1500	1500	500
	Between Contacts	V(rms)	1500	1500	1500	1500	1500	1500
Environment								
Product Certifications	Standard Version		UL	UL	UL	UL	UL	UL
Ambient Air Temperature around the Device	Storage	°C	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85	-40...+85
	Operational	°C	-40...+55	-40...+55	-40...+55	-40...+55	-40...+55	-40...+70
Vibration Resistance	Operational	g-n	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz	3, 10 - 55 Hz
Shock Resistance		g-n	10	10	10	10	10	10
Degree of Protection			—	—	—	—	—	IP40
Weight		grams	86	86	86	33	33	110

Overview

Contact arrangement - throws

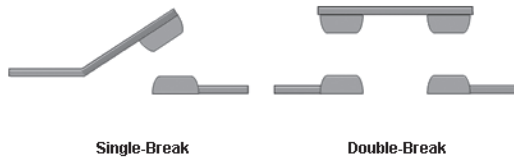


Throw is the number of different closed contact positions per pole. In other words a throw describes the total number of different circuits each pole controls.

The following abbreviations are used to indicate contact configurations:

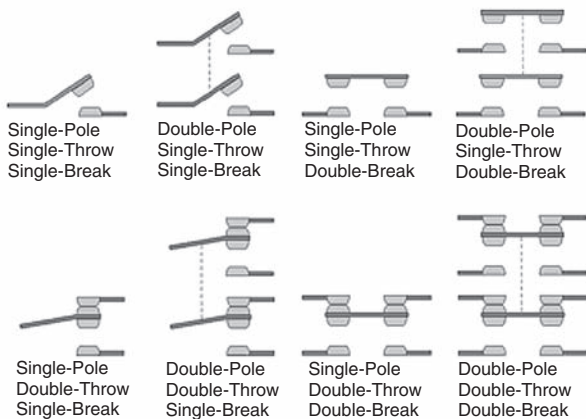
- SPST** Single-pole, single-throw
- SPDT** Single-pole, double-throw
- DPST** Double-pole, single-throw
- DPDT** Double-pole, double-throw

Contact arrangement - break



Break is the number of separate contacts the switch uses to open or close an individual circuits. If the relay breaks the circuit in one place, then it is a single break relay. If the relay breaks the circuit in two places, then it is a double break relay.

Contact arrangements overview

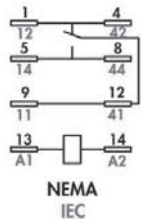


This illustration shows various contact arrangement types.

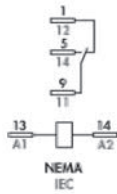
3TX71 plug-in relays

Circuit diagrams

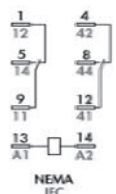
3TX7109 (SPDT)



3TX7110
SPDT



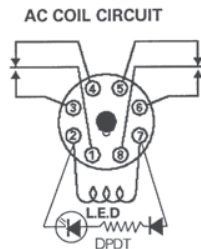
3TX7111
DPDT



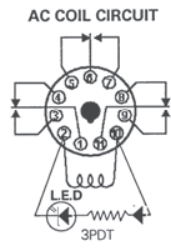
3TX7111
4PDT



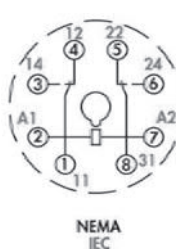
3TX7112
DPDT



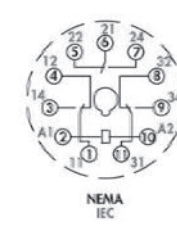
3TX7112
3PDT



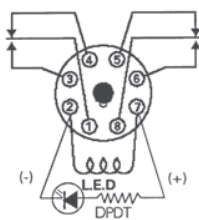
3TX7112-1L, -1D
DPDT



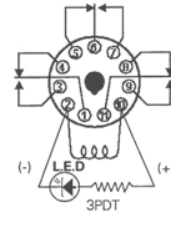
3TX7112-1N, -1F
3PDT



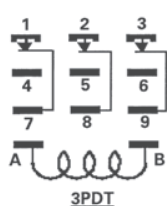
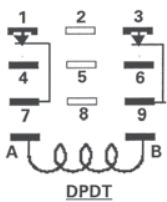
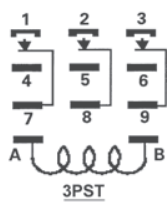
DC COIL CIRCUIT



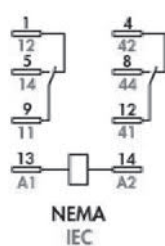
DC COIL CIRCUIT



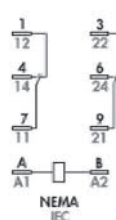
3TX7113
DPDT, 3PST, 3PDT



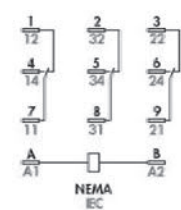
3TX7114
DPDT



3TX7115
DPDT



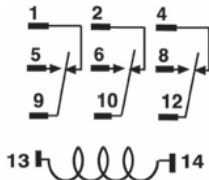
3TX7115
3PDT



Circuit diagrams

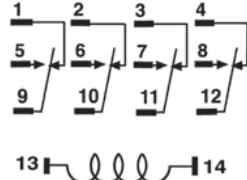
3TX7116

3PDT

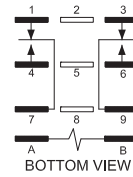


3TX7117

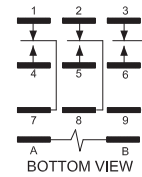
4PDT



3TX7119 (DPDT)

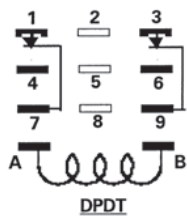


3TX7119 (3PDT)

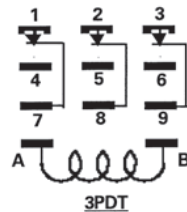


3TX7121

DPDT, 3PDT



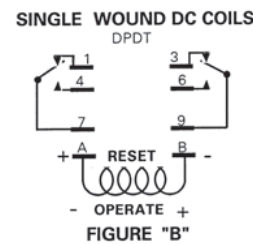
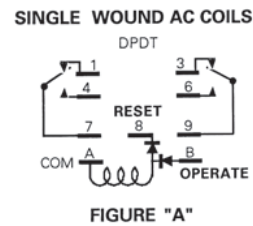
DPDT



3PDT

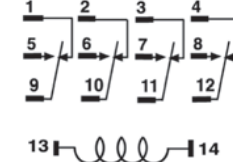
3TX7125

DPDT

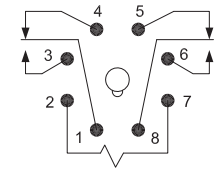


3TX7126/ 3TX7127

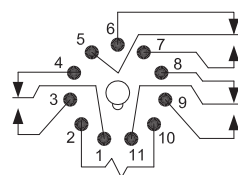
4PDT



3TX7127 (DPDT)



3TX7127 (3PDT)



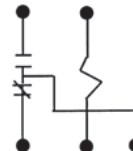
3TX7130

SPST-NO



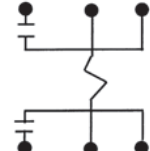
3TX7130

SPDT



3TX7130

DPST-NO



3TX7130

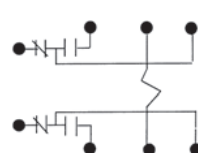
SPST-NC



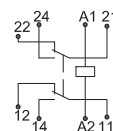
SPST-NC-DB

3TX7130

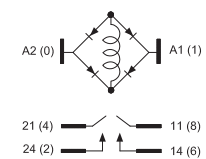
DPDT



3TX7130 (DPDT)



3TX7131 (DPST-NO) (AC)



Function Relays, Interfaces and Converters

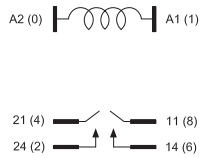
Coupling Relays and Interfaces

3TX71 plug-in relays

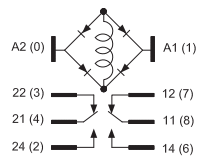
SIRIUS RELAYS

Circuit diagrams

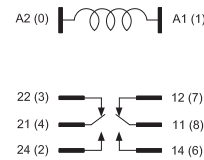
3TX7131 (DPST-NO) (DC)



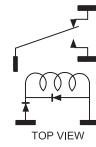
3TX7131 (DPDT) (AC)



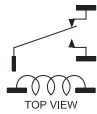
3TX7131 (DPDT) (DC)



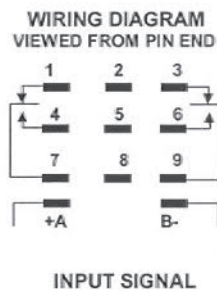
3TX7132 (SPDT) (AC)



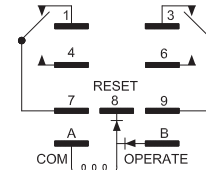
3TX7132 (SPDT) (DC)



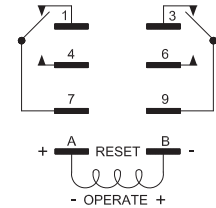
**3TX7136
DPDT**



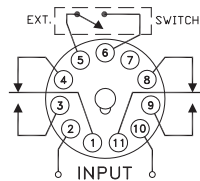
3TX7137 (DPDT) (AC)



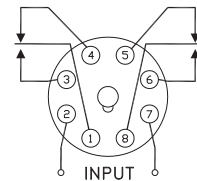
3TX7137 (DPDT) (DC)



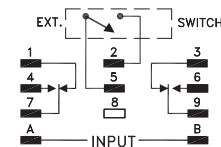
OFD-DFOB (DPDT)



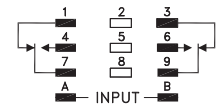
OND-DFOB (DPDT)



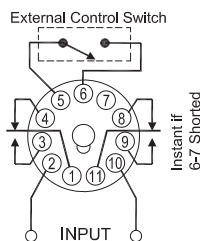
OFD-DFSB (DPDT)



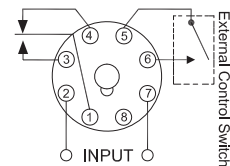
OND-DFSB (DPDT)



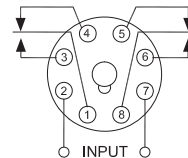
OFD-DFPR-00 (DPDT)



OND-DFPR-01 (SPDT)



OND-DFPR-02 (DPDT)

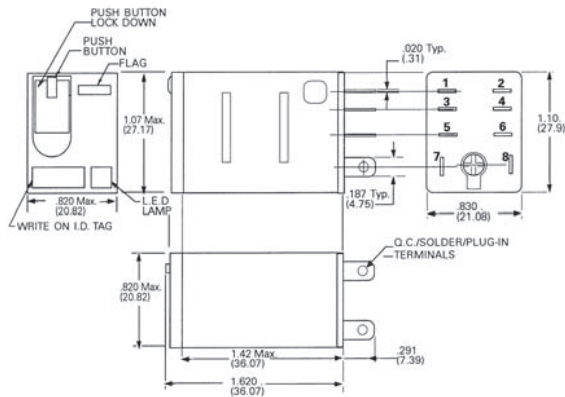


3TX71 plug-in relays

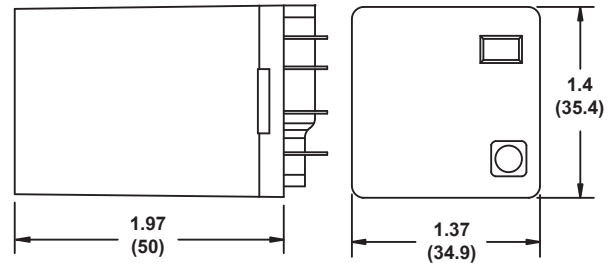
3TX71 plug-in relays

Dimension drawings

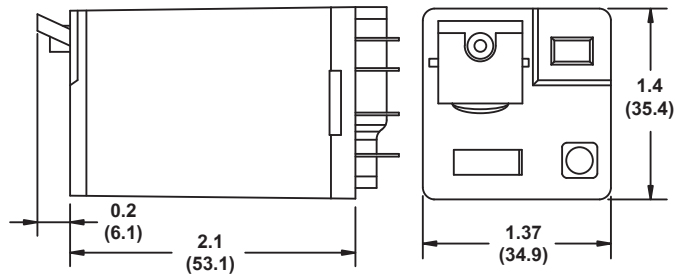
3TX7114 DPDT



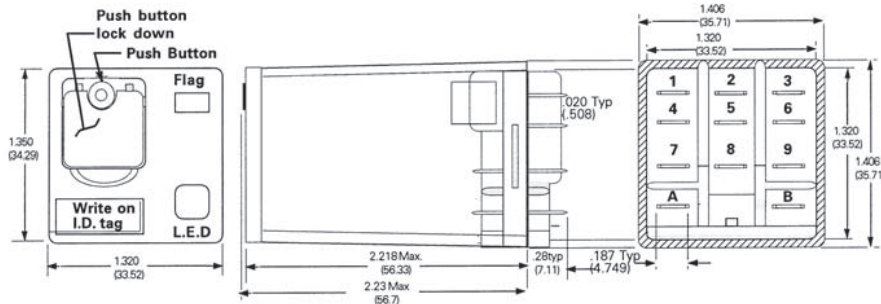
3TX7115 (DPDT) (clear cover)



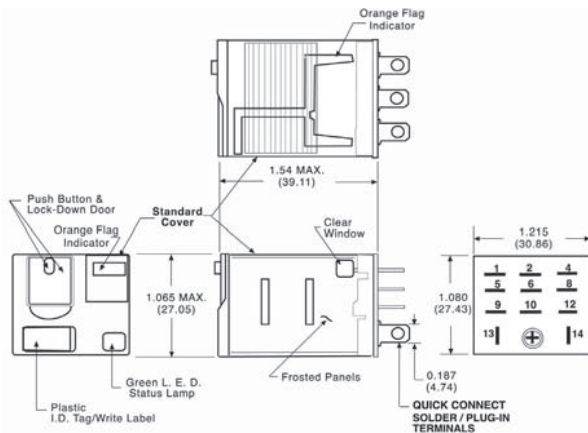
3TX7115 (DPDT) (full feature)



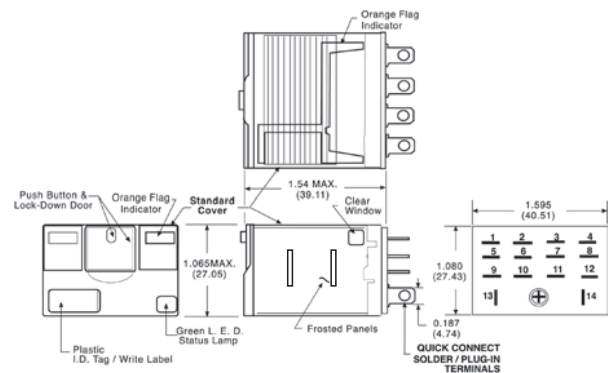
3TX7115 3PDT



3TX7116 3PDT

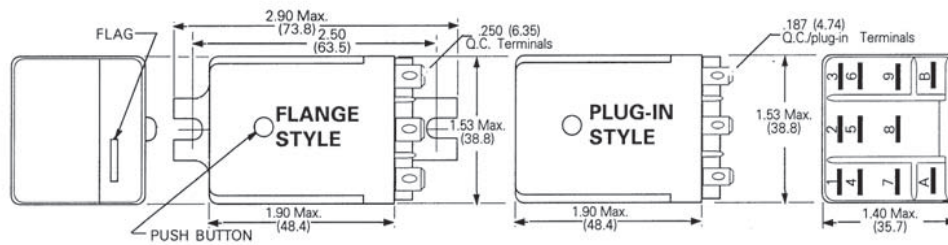


3TX7117 4PDT

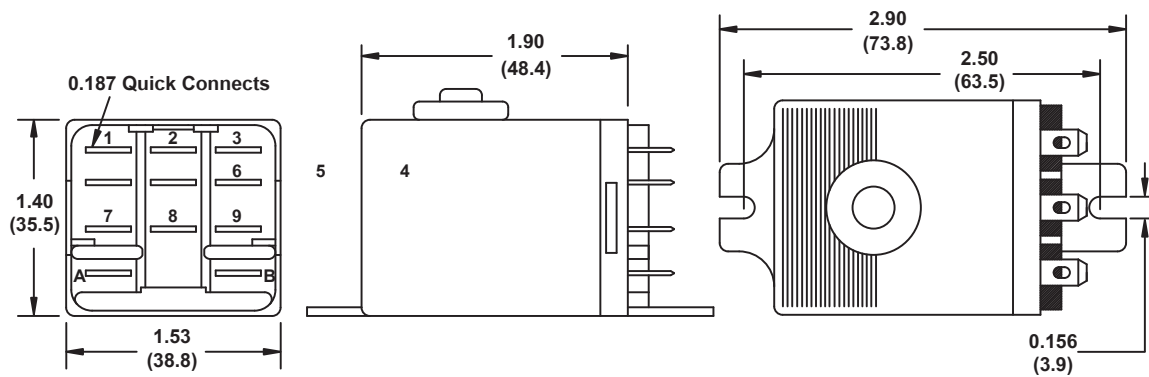


Dimension drawings

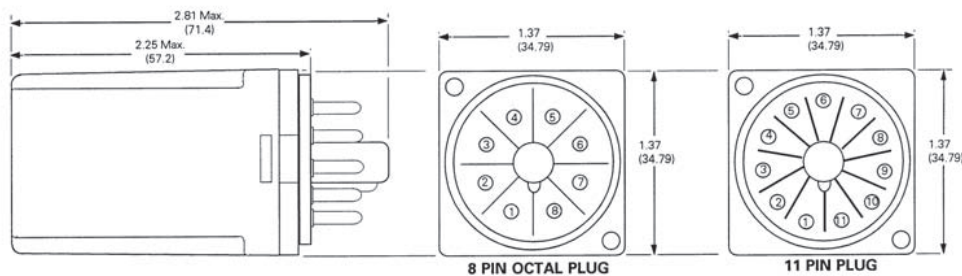
3TX7119 DPDT



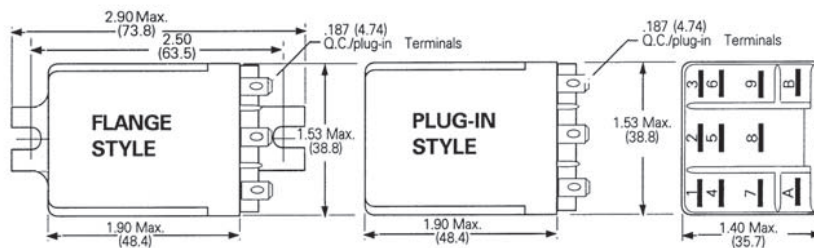
3TX7119 (3PDT)



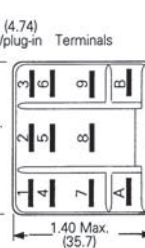
3TX7120



3TX7121/3TX7122



3TX7123



Function Relays, Interfaces and Converters

Coupling Relays and Interfaces

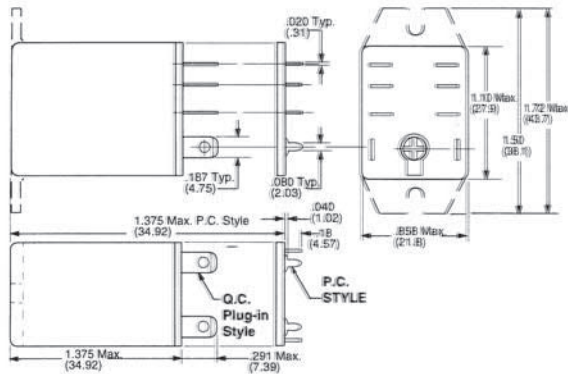
3TX71 plug-in relays

• Revised •
12/10/14

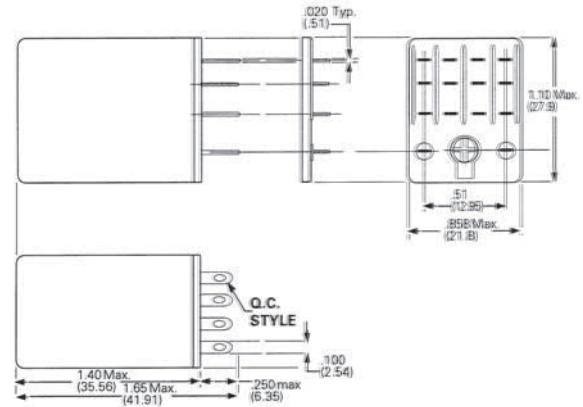
SIRIUS
RELAYS

Dimension drawings

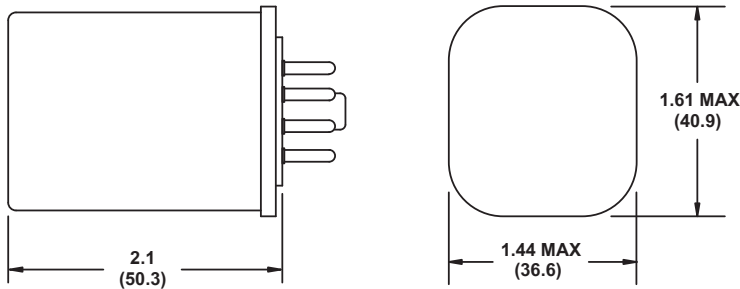
3TX7123



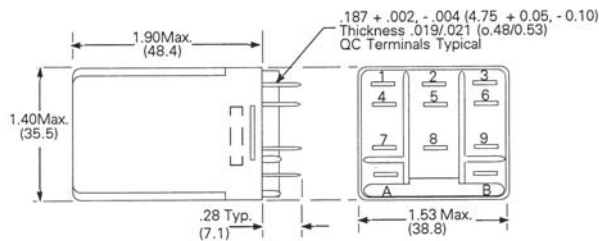
3TX7126



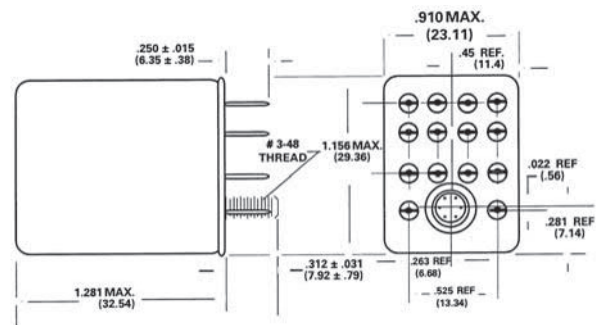
3TX7127 (DPDT)



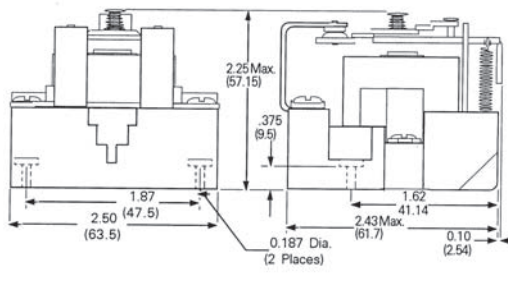
3TX7127 3PDT



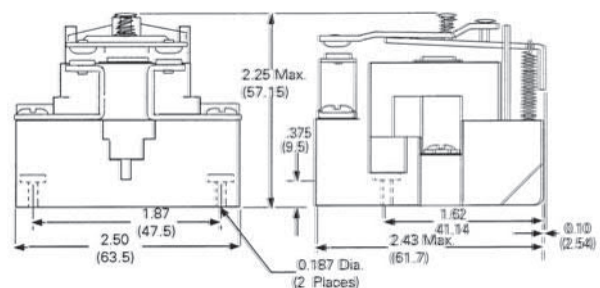
3TX7127 4PDT



3TX7130 SPST NC

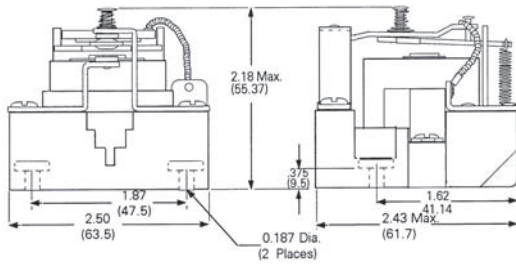


3TX7130 SPST NO

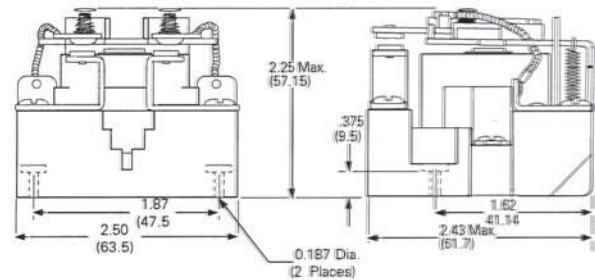


Dimension drawings

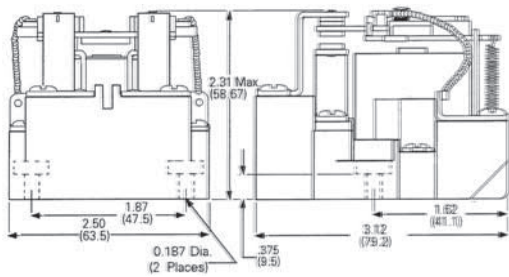
3TX7130 SPDT



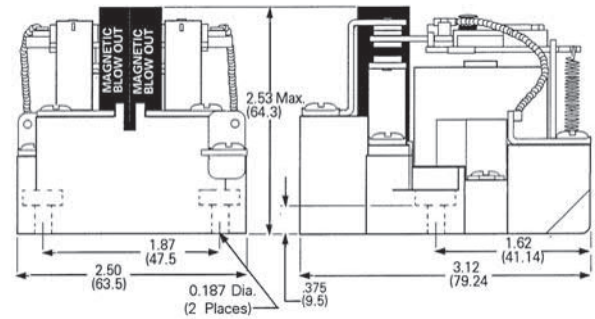
3TX7130 DPST NO



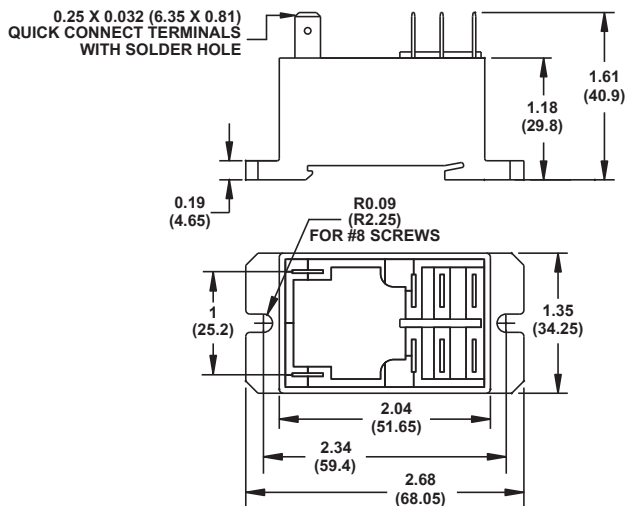
3TX7130 DPDT



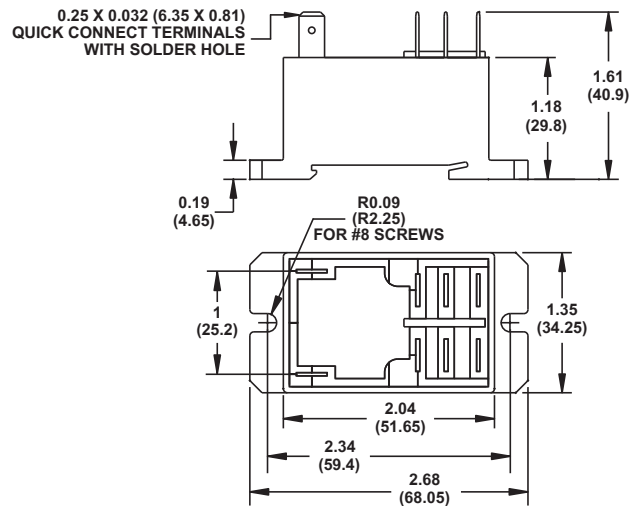
3TX7130 DPDT with magnetic
blowout



3TX7131 (DPST-NO)



3TX7131 (DPDT)



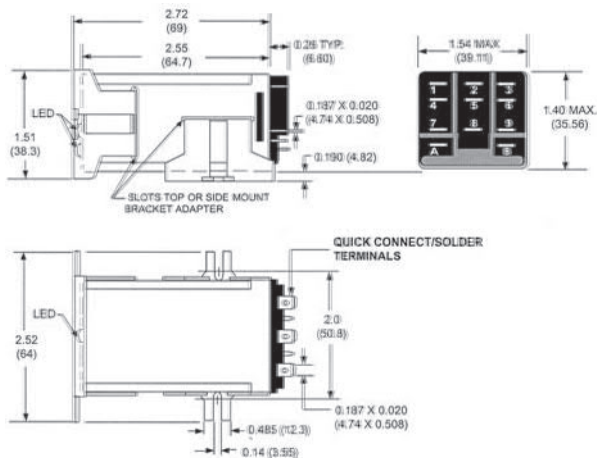
Coupling Relays and Interfaces

SIRIUS RELAYS

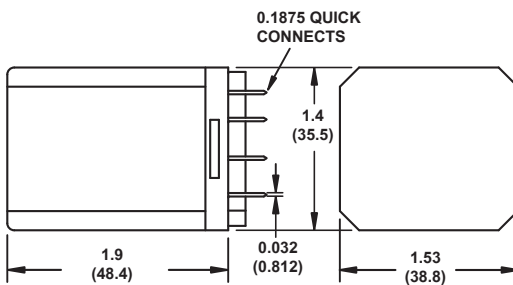
3TX71 plug-in relays

Dimension drawings

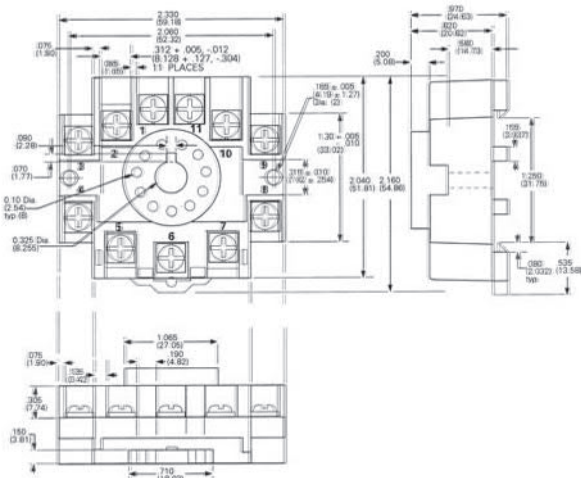
3TX7136



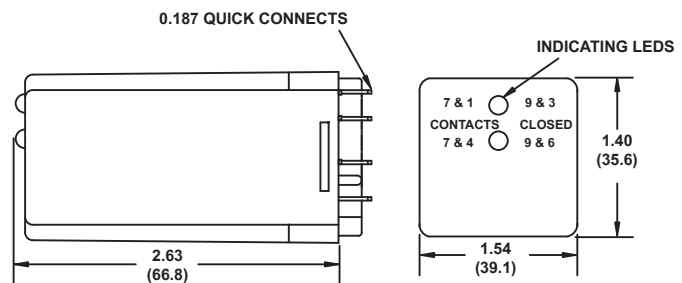
3TX7137 (DPDT)



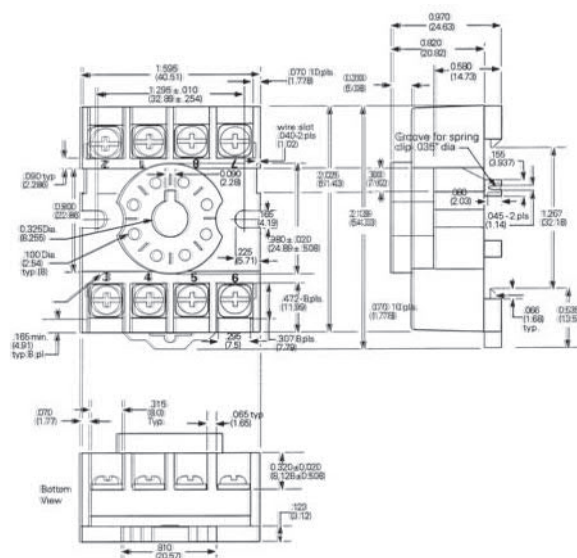
3TX7144-1E3



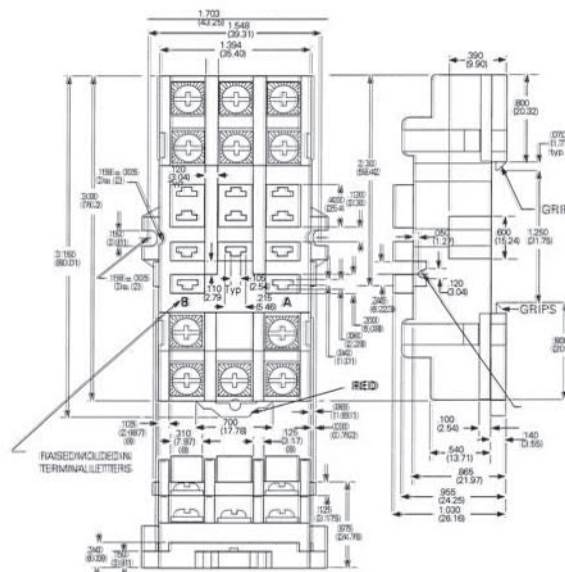
3TX7136 (DPDT Alternating)



3TX7144-1E2

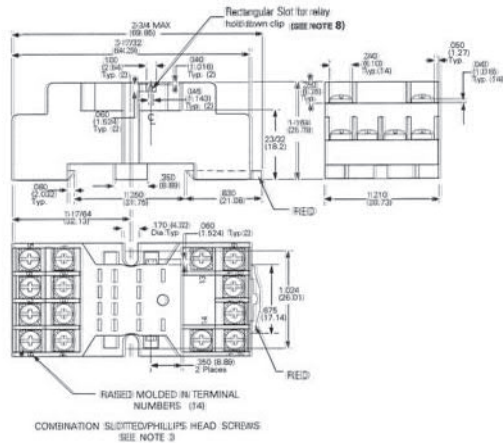


3TX7144-1E4

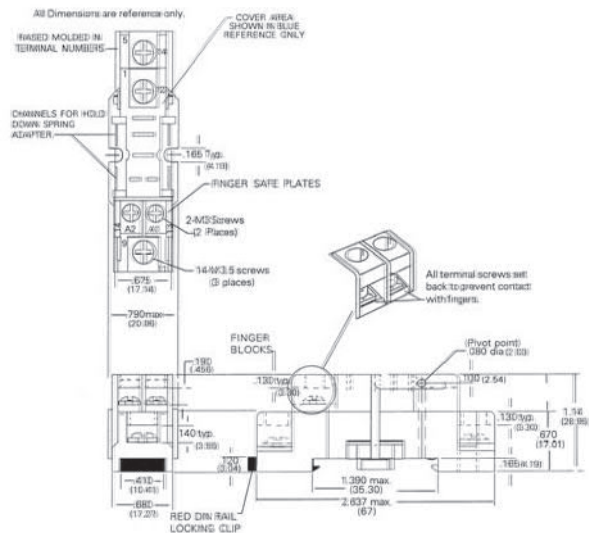


Dimension drawings

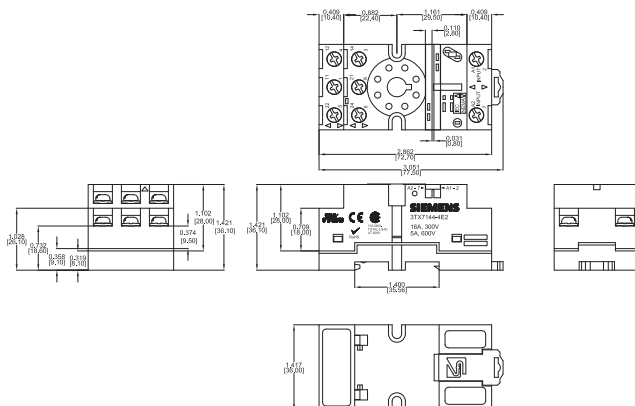
3TX7144-1E5



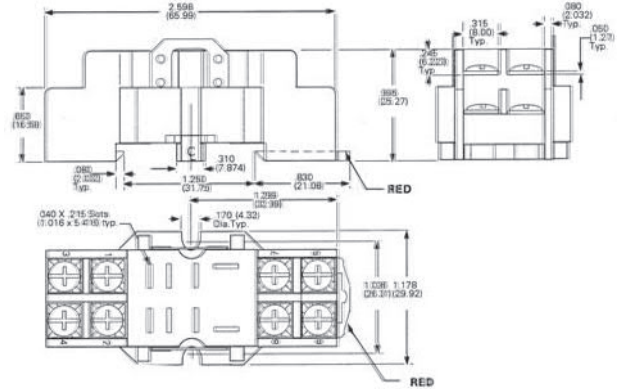
3TX7144-1E7



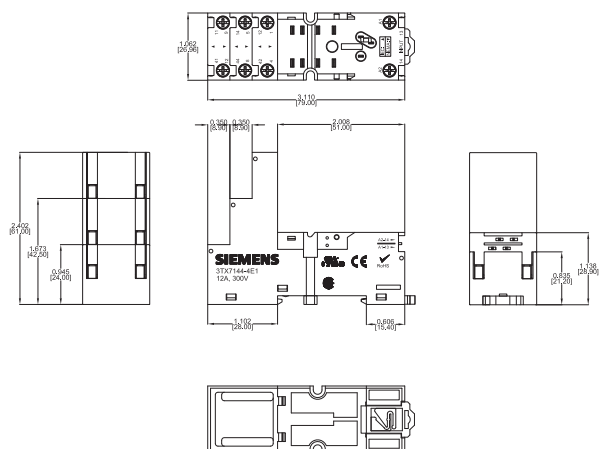
3TX7144-4E2



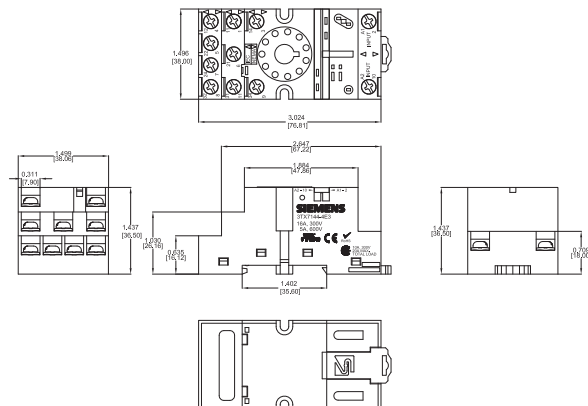
3TX7144-1E6



3TX7144-4E1



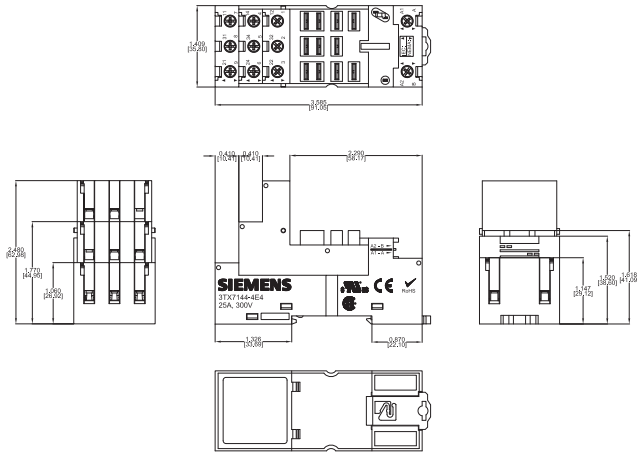
3TX7144-4E3



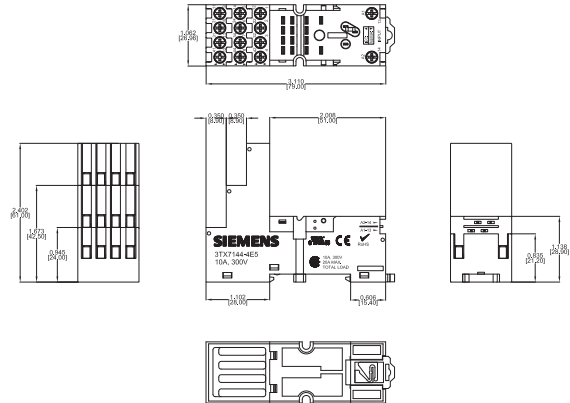
3TX71 plug-in relays

Dimension drawings

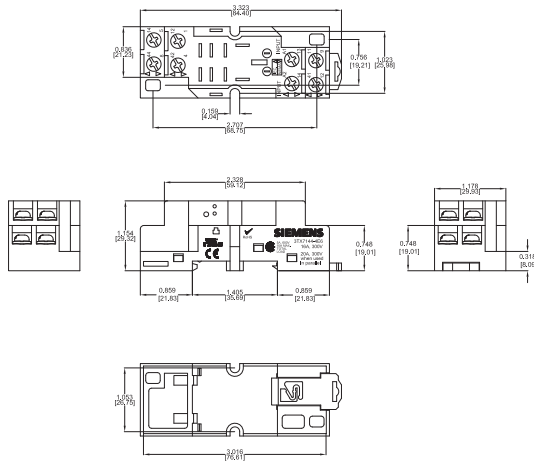
3TX7144-4E4



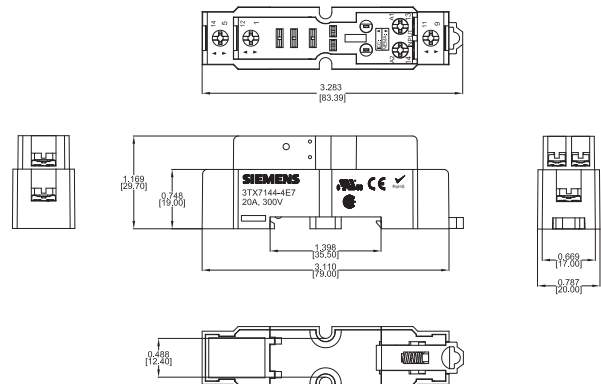
3TX7144-4E5



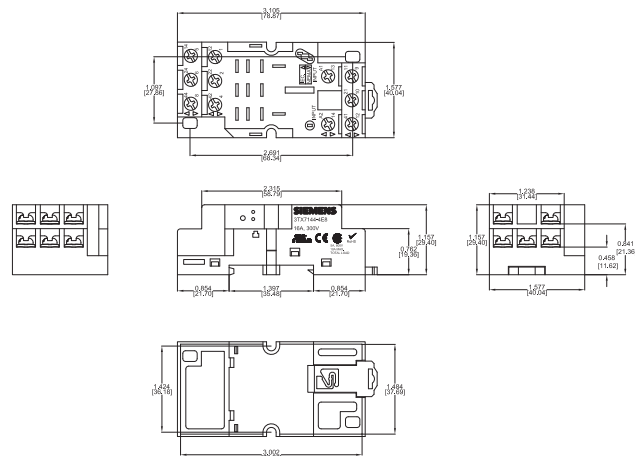
3TX7144-4E6



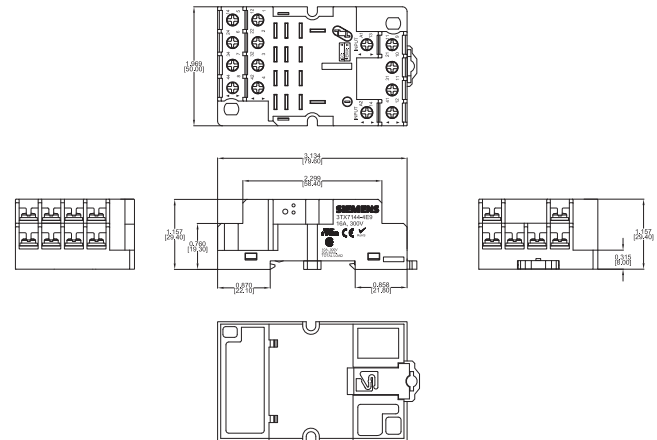
3TX7144-4E7



3TX7144-4E8

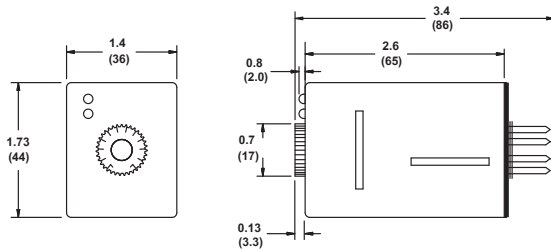


3TX7144-4E9

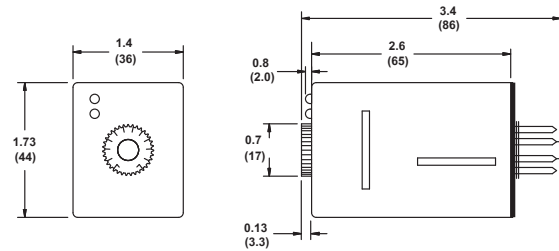


Dimension drawings

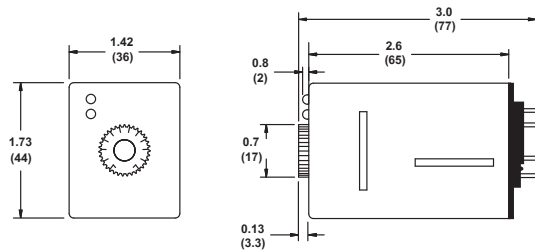
OFD-DFOB (DPDT)



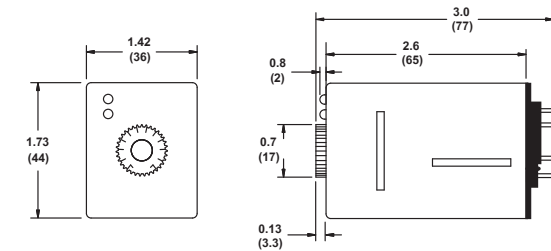
OND-DFOB (DPDT)



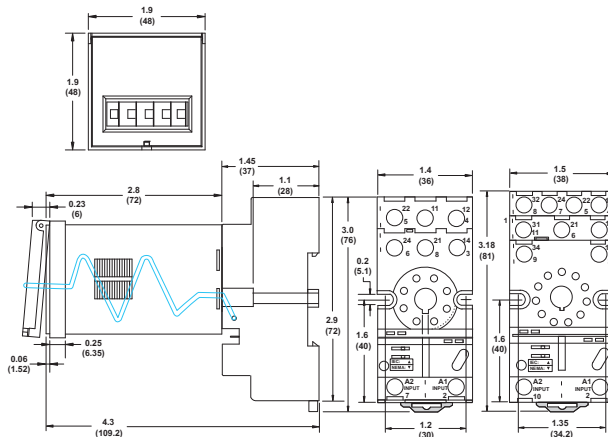
OFD-DFSB (DPDT)



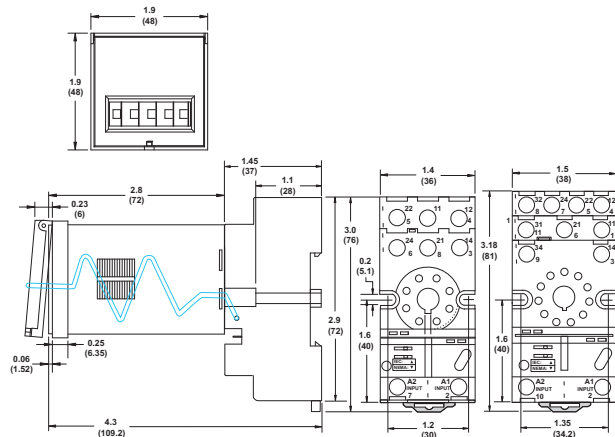
OND-DFSB (DPDT)



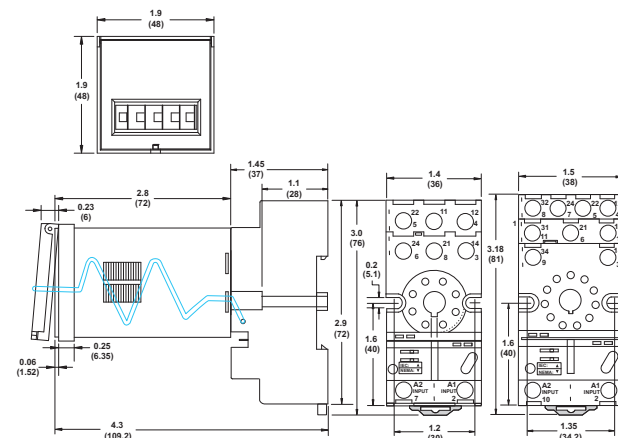
OFD-DFPR-00 (DPDT)

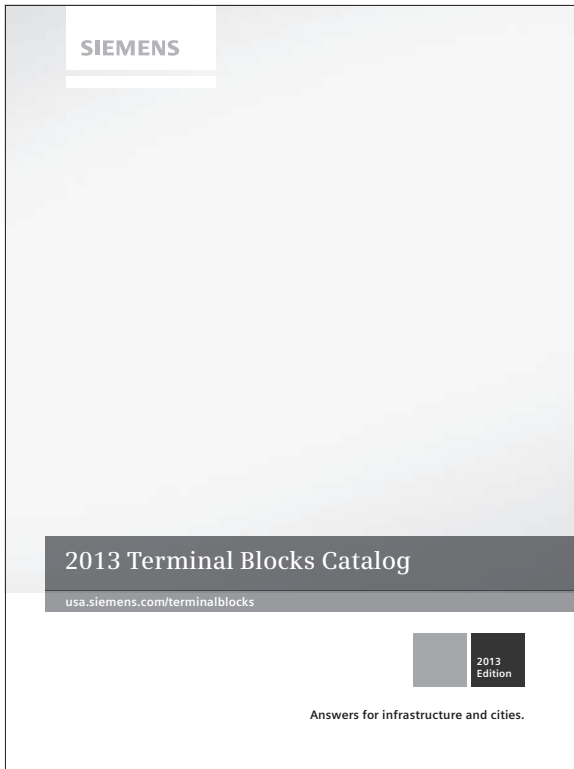


OND-DFPR-01 (SPDT)



OND-DFPR-02 (DPDT)





Siemens complete terminal block offering is found in the [2013 Terminal Block Supplemental Catalog](#), Order No. PDCA-TERMB-1013

In this section you will find the Table of Contents for the 2013 Terminal Block Supplemental and information not found in the supplemental catalog.

A PDF version of the catalog can be downloaded from the Siemens' Internet Site at: www.usa.siemens.com/terminalblocksupplement

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Terminal Blocks

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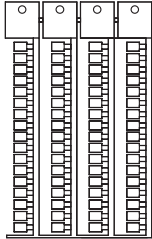
Terminal Blocks

Labeling Plates for Ink Plotter System

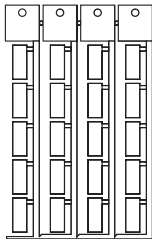
8WA1/8WH

Labeling accessories:

Labeling plates
for modular terminals,
1 frame = 68 plates



Equipment identification labels,
1 frame = 20 labels



Description	Inscription area/color W x H mm	Order No.	List Price \$	Price Unit (PU) Labels	Order Multiples Labels
8WA blank labeling plates (plotter inscription)					
Labeling plates					
for 8WA1 and 8WA2 individually detachable	5 x 7, white 5 x 10, white	8WA8 850-2AY 8WA8 851-2AY		100 100	1020 1020
for 8WA1 singly, for 8WA2 together to be used in grid pattern					
Terminal size 2.5 mm ²	5 x 10	8WA8 854-2AY		100	1260
for 8WA2 from terminal size 4 mm ²	6 x 7 6 x 10	8WA8 853-2AY 8WA8 855-2AY		100 100	1080 1080
Equipment identification labels	20 x 9, white	3TX4 210-0R		100	380

Description	Inscription area/color Width mm	Order No.	List Price \$	Price Unit (PU) Labels	Order Multiples Labels
8WA blank labeling plates (plotter inscription)					
Labeling plates					
Front (Top)					
Individually detachable	4.2 5.2 and 6.2 8.2, 10 and 15	8WH8 112-1AA05 8WH8 112-2AA05 8WH8 112-4AA05		100 100 100	1024 1400 1000
Flat (Side)					
Individually detachable	4.2, 5.2, 6.2, 8.2, and 10 15	8WH8 113-1AA05 8WH8 113-6AA05		100 100	2000 1080

**Computer labeling system
for individual inscription of:**

- Labeling plates for terminal blocks
- Device labeling plates
- Label plates for individual wires

Obtain from:

Murrplastik Systems, Inc.
North American Operations
 2367 North Penn Road, Suite 200
 Hatfield, PA. 19440
 Telephone: 877-340-3444
 Fax: 215-822-7626
 E-Mail: cablemgmt@murrplastik.com
 Internet: www.murrplastik.com

8WA and 8WH Labeling Plates per Frame

8WA Labeling Plates		8WH Labeling Plates	
Order No.	Labels per Frame	Order No.	Labels per Frame
8WA8 850-2AY, 8WA8 851-2AY¹⁾	68	8WH8 112-1AA05, 8WH8 112-4AA05	64
8WA8 854-2AY	84	8WH8 112-2AA05	88
8WA8 853-2AY, 8WA8 855-2AY	72	8WH8 113-1AA05	mixed
3TX4 210-0R	20	8WH8 113-6AA05	19

¹⁾ Not suitable for two-tier terminals (lower tier); push-on terminals:
 8WA1 010-1PQ00, 8WA1 808, 8WA1011-1DQ10 and 8WA1011-1DS10.

Terminal Blocks

Special Label Instructions

8WA1/8WA2

Description

8WA8848... 8WA8847... labels are used when special label inscriptions are required. **See page 12/5 for Special Label Order Form.**

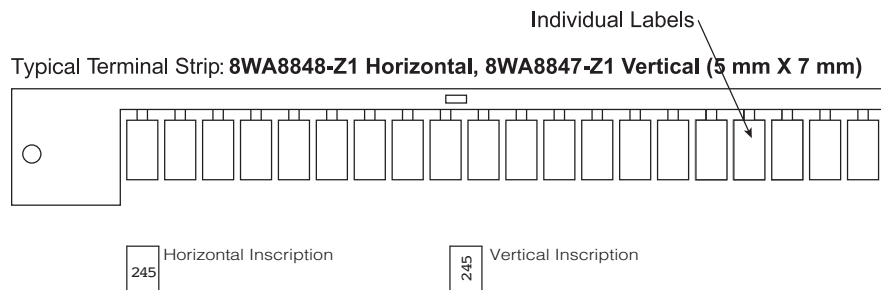
Ordering information

- Select catalog number required for your order.
- Type legibly the catalog no. and quantity in the area provided. The printed, legible inscription must be exactly how it is to appear on the completed labels.

NOTE: If the form selected is being completed by someone other than the end user, please make sure that the end user

reviews the layout before submitting the form to customer service.

- Fax completed forms to:
Siemens Customer Service
FAX **800-547-5864**
- **Lead time.** Typical lead time is five (5) working days from the time customer service receives a completed and approved order form.



Note: Special Labeling Plates are sold in multiples of 100 labels I.E. 100, 200,..., etc. Orders cannot be placed in strips.

Selection data

Label dimensions ¹⁾ mm	Strips per order	Labels per strip	Rows per label	Characters per label	Inscription format	Order No.	List Price \$	Order Multiples Labels
							1 unit	
5 x 7 mm	5	20	2	6	Horizontal	8WA8 848-Z1		100
5 x 7 mm	5	20	3	6	Vertical	8WA8 847-Z1		100

Horizontal 8WA8848-Z1

1	2
3	4
5	6

5 X 7
Max: 2 rows
Max: 3 characters
per row
Total: 6 characters

Vertical 8WA8847-Z1

3	6
2	5
1	4

5 X 7
Max: 3 rows
Max: 2 characters
per row
Total: 6 characters

Vertical inscription 8WA8 847-m m	Inscription as required (100 labels)	Z1 (5 mm / 7 mm)
Horizontal inscription 8WA8 848-m m	Inscription as required (100 labels)	Z1 (5 mm / 7 mm)
Without inscription 8WA8 848-m m	2AY (100 labels)	2AY (5 mm / 7 mm)

1) 25.4 mm = 1.00 inch.

2

SIEMENS

Special 8WA884... Label inscriptions
(Label Size 5 mm x 7 mm - 100 labels)

Order Form

Account No.	Date
Distributor	
Address	
City, State/Zip Code	
Contact Person	Purchase Order No.
Telephone ()	Requested Ship Date
FAX ()	Siemens Order No.

Type or print legibly in areas below exactly how the information is to appear on the 8WA884...Labels

8WA884 -Z1

Qty _____

Note: Qty 1 = 100 labels with markings per this page only.

Qty 2 = 200 labels with
markings per this page
I.E. 1,2,3,...,100 (Twice)

A 10x10 grid of empty squares, intended for drawing a 10-sided die.

REPRODUCE THIS FORM BEFORE COMPLETING. FAX completed form to: Customer Service at **800-547-5864**.



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Plastic, 31 mm



Plastic, 50 mm



Metal, 40 mm



Metal, 56 mm



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3SE03, Metal Enclosure

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3SE7



Metal, 40 mm



Interlock, Metal, 54 mm



Hinge, Plastic, 31 mm



3SE6 RFID Switch



3SE6, Magnet System



3SB3 Two-Hand Control

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3RK3 Modular Safety System

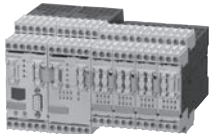
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3SK1



3TK2845



3RK3

Introduction

Overview



	Position switches, standard					Safety hinge switches	
Enclosure							
Plastic	✓	✓	✓	—	—	✓	✓
Metal	✓	—	✓	✓	✓	✓	✓
Dimensions (W x H x D) in mm	31 x 68 x 33	50 x 53 x 33	40 x 78 x 38	56 x 78 x 38	56 x 100 x 38	31 x 68 x 33	40 x 78 x 38
Degree of protection	IP65, IP66/IP67	IP66/IP67	IP66/IP67	IP66/IP67	IP66/IP67	IP65, IP66/IP67	IP66/IP67
Standards							
IEC 60947-5-1	Mounting and operating points acc. to EN 50047	Operating points acc. to EN 50047	Mounting and operating points acc. to EN 50041	Operating points acc. to EN 50041	Operating points acc. to EN 50047	Mounting and operating points acc. to EN 50047	Mounting and operating points acc. to EN 50041
Approvals	CE, UL, CSA, CCC		CE, UL, CSA, CCC			CE, UL, CSA, CCC	
Contact blocks							
2 slow-action contacts	1 NO + 1 NC, 2 NC		1 NO + 1 NC, 2 NC	—	—	1 NO + 1 NC	
2 snap-action contacts	1 NO + 1 NC		1 NO + 1 NC	—	—	1 NO + 1 NC	
• Short stroke	1 NO + 1 NC		✓	—	—	✓	
• With 2 x 2 mm contact gap	1 NO + 1 NC		✓	—	—	✓	
3 slow-action contacts	1 NO + 2 NC, 2 NO + 1 NC		1 NO + 2 NC, 2 NO + 1 NC	—	—	1 NO + 2 NC	
• With make-before-break	1 NO + 2 NC		1 NO + 2 NC	—	—	1 NO + 2 NC	
3 snap-action contacts	1 NO + 2 NC		1 NO + 2 NC	—	—	1 NO + 2 NC	
2 x (2 or 3 contacts)	—		—	✓	—	—	
Special features							
LED status display	✓		✓	—	—	✓	
Increased corrosion protection	✓		✓	✓	✓	✓	
Explosion protection (ATEX)	—		✓	✓	✓	✓	
ASIsafe integrated	✓		✓	—	—	✓	
Electrical specifications							
Insulation voltage U_i	400 V		400 V			400 V	
Conventional thermal current I_{the}	6 A/10 A (3-/2-pole)		6 A/10 A (3-/2-pole)			6 A/10 A (3-/2-pole)	
Connections							
Cable entry	1 x M20 x 1.5	2 x M20 x 1.5	1 x M20 x 1.5	3 x M20 x 1.5	1 x M20 x 1.5	1 x M20 x 1.5	1 x M20 x 1.5
M12 connector socket, 4-, 5- or 8-pole	✓	✓	✓	✓	✓	✓	✓
Connector socket, 6-pole + PE	—	—	✓	✓	—	—	—
Actuators							
Rounded plungers and roller plungers	✓		✓			—	
Roller and angular roller levers	✓		✓			—	
Spring rod	✓		✓			—	
Twist levers and rod actuators	✓		✓			—	
Fork lever	—		✓			—	
Hinge switches	—		—			✓	
Page							
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ASIsafe	on-line	on-line	on-line	on-line	—	on-line	on-line
ATEX	on-line	on-line	on-line	on-line	on-line	on-line	on-line

✓ Available
— Not available



	Compact design	Open-type	Safety switches with separate actuator		Safety switches with solenoid interlocking	RFID safety switch
Enclosure						
Plastic	—	✓	✓	✓	✓	✓
Metal	✓	—	✓	✓	✓	—
Dimensions (W x H x D) in mm	30 x .. x .., 40 x .. x ..	30 x 48.5 x 20	31 x 68 x 33, 50 x 53 x 33	40 x 78 x 38, 56 x 78 x 38	54 x 185 x 44	25 x 91 x 22
Degree of protection	IP66/IP67	IP10 or IP20	IP65, IP66/IP67	IP66/IP67	IP66/IP67	IP69K
Standards	—	Mounting and operating points acc. to EN 50047	Mounting acc. to EN 50047	Mounting acc. to EN 50041	EN 1088	Category 4 acc. to ISO 13849-1, PL e acc. to ISO 13849-1, SIL 3 acc. to IEC 61508
IEC 60947-5-1	—	—	—	—	—	—
Approvals	CE, UL, CSA	—	CE, TÜV, UL, CSA, CCC		CE, TÜV, UL, CSA, CCC	CE, TÜV
Contact blocks						
2 slow-action contacts	—	1 NO + 1 NC	1 NO + 1 NC	—	—	—
2 snap-action contacts	1 NO + 1 NC	1 NO + 1 NC	—	—	—	—
• Short stroke	—	✓	—	—	—	—
• With 2 x 2 mm contact gap	—	✓	—	—	—	—
3 slow-action contacts	—	1 NO + 2 NC	1 NO + 2 NC	—	—	—
• With make-before-break	—	1 NO + 2 NC	—	—	—	—
3 snap-action contacts	—	1 NO + 2 NC	—	—	—	—
6 slow-action contacts	—	—	—	—	2 x (1 NO + 2 NC)	—
Special features						
LED status display	—	—	✓	—	✓	✓
Increased corrosion protection	—	—	✓	—	✓	✓
Explosion protection (ATEX)	—	—	✓	—	—	—
ASIsafe integrated	—	—	✓	—	✓	—
Electrical specifications						
Insulation voltage U_i	400 V	400 V	400 V	—	400 V	—
Conventional thermal current I_{the}	10 A	6 A	6 A	—	6 A	—
Connections						
Cable entry	—	—	1 x M20 x 1.5, 2 x M20 x 1.5	1 x M20 x 1.5, 3 x M20 x 1.5	3 x M20 x 1.5	—
M12 connector socket, 4-, 5- or 8-pole	✓	—	✓	✓	✓	✓
Molded cables	✓	—	—	—	—	—
AS-Interface	—	—	✓	✓	✓	—
Actuators						
Plungers, twist levers	✓	✓	—	—	—	—
Separate actuators	—	—	✓	—	✓	—
Page						
Complete units	13/46	13/47	13/82	13/85	13/95	—
Modular system	—	—	—	—	—	13/110
ASIsafe	—	—	on-line	on-line	on-line	—
ATEX	—	—	on-line	on-line	—	—

✓ Available
— Not available

Limit Switches

SIRIUS 3SE5 International Limit Switches

General Data

Overview

Position switches in the innovative SIRIUS 3SE5 series are modern in design, compact, modular and simple to connect.

Complete units

Popular versions of the position switches in standard enclosures are available as complete units.



Position switches with plastic and metal enclosures

Modular system

The 3SE5 series features a new modular system comprising different sizes of the basic switch and an actuator which must be ordered separately. Thanks to the modular construction of the switch the user can select the right solution for his application from numerous versions and install it himself in a very short time. The short delivery times of the modules enable fast replacement and thus ensure high plant availability.



Examples of selection options in the modular system

Design

Enclosure sizes

All enclosure versions have an integrated chlorinated rubber diaphragm for high functional safety in cold and aggressive environments.

The 3SE5 switches are available in five different enclosure sizes with 2 or 3 contacts and with the XL enclosure:

- Open-type position switch IP20 or IP10
- Plastic enclosures according to EN 50047 (31 mm wide), IP65, 1 cable entry
- Plastic enclosures (50 mm wide), IP66/IP67, 2 cable entries
- Metal enclosures according to EN 50047, (31 mm wide), IP66/IP67, 1 cable entry
- Plastic and metal enclosures according to EN 50041 (40 mm wide), IP66/IP67, 1 cable entry
- Metal enclosures (56 mm wide), IP66/IP67, 3 cable entries
- XL metal enclosures with 4 to 6 contacts, 56 mm wide, IP66/IP67, 3 cable entries

Various basic switches can be selected for the 3SE5 series:

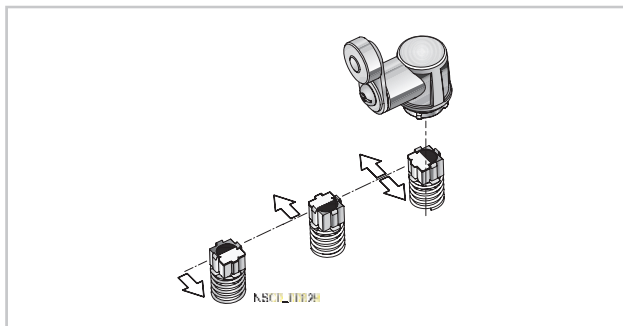
- With contact blocks with two or three contacts (screw terminals) designed as slow-action or snap-action contacts; the slow-action contacts also make-before-break
- Optional LED status display
- With mounted four or five-pole M12 connector socket (available for the wide enclosures as an accessory for self-assembly)
- With 6-pole connector socket + PE on the metal enclosures
- With increased corrosion protection
- Versions for operating temperature to -40° C
- Metal enclosures for explosion protection (ATEX)
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs

Actuator variants

All operating mechanisms can be rotate around the axis in increments of 22.5°. The following actuator variants are available:

- Standard, rounded and roller plungers
- Roller and angular roller levers
- Spring rods
- Twist levers and rod actuators
- Fork levers with twist actuator

The actuator rollers are available with various materials and diameters.



Twist actuators for twist levers and rod actuators, with setting of switching to right, left or right/left (standard for all twist actuators except version for fork levers)

Limit Switches

SIRIUS 3SE5 International Limit Switches

General Data

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Optional LED indicators

LED indicators available for all enclosure sizes



The enclosure versions can be supplied with an LED signaling indicator (1 × green + 1 × yellow). This is the first time that optical signaling equipment is also available for small standard enclosures according to EN 50047. The LED signaling indicators are available in all common voltages (24 V DC and 230 V AC).

Additional contacts

Exchangeable two and three-pole switching blocks for all enclosure sizes



The three-pole switching block (2 NC, 1 NO) in snap-action and slow-action is regularly available for all enclosure forms. It offers more switching through redundant shutdowns (2 NC contacts) with simultaneous signaling (1 NO contact). The same installation space is required as for a two-pole switching block.

Contact reliability

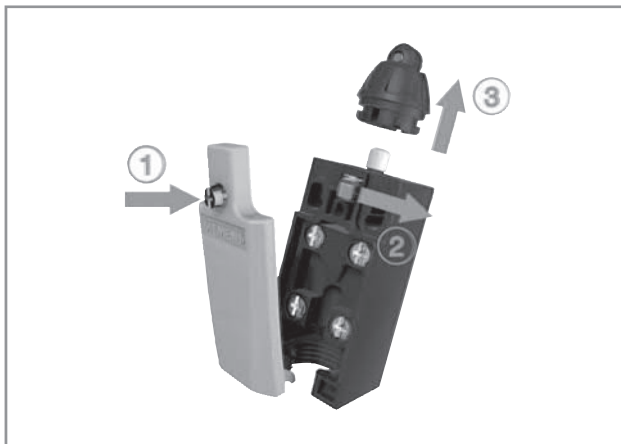
The new contact blocks ensure an extremely high contact stability. This applies even when the devices are switching low voltages and currents, e. g. 1 mA at 5 V DC.

Positive opening ➞

The NC contacts of the switch are forced open mechanically, positively-driven and reliably by the plunger. This is referred to as "positive opening".

Mounting

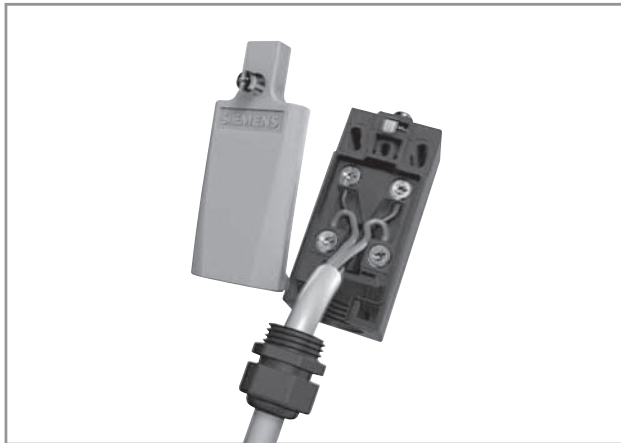
Easy plug-in method – for fast replacement of the actuator head



- (1) Open cover
- (2) Actuate locking lever
- (3) Replace the head (turnable by 16 x 22.5°)
- (4) Lock and close the cover

Fast connection method

For plastic enclosure with a width of 31 mm



These position switches can be wired quickly and easily as an added customer benefit. The connecting cable is first connected to the terminals of the contact block and then guided through a slit into the cable gland opening. The time saved through this new connection method is approx. 20 to 25 %.

Limit Switches

SIRIUS 3SE5 International Limit Switches

General Data

Benefits

The 3SE5 position switches differ from the previous series through the following new characteristics:

- The modular design of the product range allows a number of versions with a smaller number of bearing types for enclosures and operating mechanisms.
- All actuators can be turned around the axis in increments of 22.5° (see picture on page 13/6).
- Rounded and roller plungers according to EN 50041 with 3 mm overtravel (total travel 9 mm) for greater tolerance when switching
- All enclosure sizes – now also including the small enclosure 31 mm wide – are optionally available with an LED signaling indicator (see picture on page 13/7).
- All enclosure versions have an integrated chlorinated rubber diaphragm (high functional safety in cold and aggressive environments).
- All contact blocks are replaceable (see page 13/49).
- The three-pole contact blocks are available for all enclosure sizes (see picture on page 13/7).
- Elements with 1 NO + 2 NC slow-action contacts with make-before-break and 2 NO + 1 NC
- The short-stroke contact block 1 NO + 1 NC improves the precision of the switching operation through a reduced actuation path.
- The contact block with 1 NO + 1 NC snap-action contacts with 2 x 2 mm contact opening is suitable for simultaneous disconnection and signaling, particularly in the elevator industry
- NEW: XL enclosures for accommodating two 2- or 3-pole contact blocks
- The plastic enclosure with a width of 31 mm has simple and fast wiring equipment which makes it possible to save from approx. 20 to 25 % of the time when connecting (see picture on page 13/7).
- The ASIsafe electric component is integrated for the versions with the AS-Interface connection (see on-line); an additional adapter is not required.

Application

With the standard position switches, mechanical positions of moved machine parts are converted into electrical signals. Through their modular and uniform design and large number of versions, the devices can meet practically all requirements in industry.

Devices are available with enclosure versions to suit the particular ambient conditions. Different control tasks can be performed with the best contact blocks suited for the particular purpose. And many different actuator versions are available to match the mechanical configuration of the moved machined parts. Dimensions, fixing points and characteristics are largely in accordance with the EN 50041 or EN 50047 standards.

The devices are suitable for use in any climate.

Standards

IEC 60947-5-1 or EN 60947-5-1.

The protective measure of "total insulation" by the molded-plastic enclosure is guaranteed by the use of molded-plastic screw-lands.

Safety position switches

For controls according to IEC 60204-1 or EN 60204-1 the devices can be used as a safety position switch. To secure position switches against changes in their position, keyed techniques must be employed on installation.

Safety circuits

IEC 60947-5-1 and EN 60947-5-1 require positive opening of the NC contacts, i.e. for the purposes of personal safety, the assured opening of NC contacts is expressly stipulated for the electrical equipment of machines in all safety circuits and marked according to the IEC standard 60947-5-1 with the symbol q .

Category 2 according to ISO 13849-1 (EN 954-1) can be attained with 3SE5 position switches with q , and category 3 or 4 when using an additional position switch, if the corresponding failsafe evaluation units are selected and correctly installed, e.g. the 3TK28 safety relays or matching devices from the ASIsafe, SIMATIC or SINUMERIK product ranges. The operating mechanisms (actuators) must also be connected to the enclosure by keyed techniques. The corresponding operating mechanisms are marked in the catalog with q .

Contacts for each application

- Snap-action contacts: NC and NO contacts switch simultaneously – regardless of the actuating speed ($v_{\min} = 0.01$ m/s) and contact erosion.
- Slow-action contacts: Difference in travel between "NC contact opens" and "NO contact closes"; the switching speed is the same as or proportional to the actuating speed ($v_{\min} = 0.4$ m/s).
- Slow-action contacts with make-before-break: e.g. suitable for adding a second function to a sequence control.

Operating mechanisms for each application

Standard, rounded and roller plungers

- Operation in direction of the plunger axis or in case of roller plunger with bar at right angles to the plunger axis
- The roller plunger is recommended for lateral actuation and relatively long overtravel.

Roller and angular roller levers

- For actuators made of finely ground steel in the form of cams, straight-edges (approach angle 30°) or cam disks

Spring rod

- Can be used for undefined actuations and changing starting conditions
- Starting from any direction is possible

Twist levers and rod actuators

- For a high starting speed ($v = 1.5$ m/s)
- Variety of starting options
- Insensitive to oil, grinding dust and coarse-grained material
- Adjustment of the lever in increments of 10°.
- Can be adjusted with left or right switching

Fork lever

- Switchable in two directions
- Latching actuator
- For reciprocating movements

Limit Switches

SIRIUS 3SE5 International Limit Switches

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Options

On the following pages you will find selection tables for complete units as well as components of the modular system.

- ☐ Complete units
- ☒ Modular system

The difference between units is indicated in the selection and ordering data by gray backgrounds.

Using the modular system you can assemble switch variants which are not available as complete units. Each complete unit can also be supplied as a module.

A basic switch for the modular system comprises an enclosure with a contact block and a cover. Among the basic switches the following versions, for example, can be selected:

- Basic enclosure with teflon plunger
- Version with increased corrosion protection
- Version with 2 LEDs

- Version with M12 connector socket or 6-pole + PE
- Version with M12 connector socket and with 2 LEDs

For the plastic enclosures with a width of 31 and 50 mm the basic switches are designed as complete units with rounded plunger (according to standard).

Online configurator

The online configurator helps you not only to select and order the right position switch but also to create complete product documentation.

- Product data sheets
- Dimensional drawings
- Operating travel diagrams
- CAD data in 2D and 3D model images
- Ordering data
- Product photos

www.siemens.com/sirius/configurators


Complete units

Ordering example

Required:

- Position switch according to EN 50047 in a plastic enclosure
- Contact block with slow-action contacts 1 NO + 1 NC
- Angular roller lever, metal lever and plastic roller

To be ordered:

Version	Complete units <input type="checkbox"/>
Order No.	
Complete units • Enclosure width 31 mm	
 Angular roller levers With metal lever and plastic roller 13 mm Slow-action contacts 1 NO + 1 NC	3SE5 232-0BF10



Modular system

Ordering example 1

Required:

- Position switch according to EN 50047 in a plastic enclosure
- Contact block with slow-action contacts 1 NO + 1 NC
- Angular roller lever, metal lever and plastic roller

To be ordered separately:




Version	Modular system <input checked="" type="checkbox"/>
Order No.	
Basic switches • Enclosure width 31 mm	
 With teflon plunger Slow-action contacts 1 NO + 1 NC	3SE5 232-0BC05
+	
Operating mechanisms	
 Angular roller levers Metal lever, plastic roller	3SE5 000-0AF10

Ordering example 2

Required:

- Position switch according to EN 50047 in a plastic enclosure
- Contact block with slow-action contacts 1 NO + 1 NC
- Twist lever, high-grade steel lever and plastic roller

To be ordered separately:

Version	Modular system <input checked="" type="checkbox"/>
Order No.	
Basic switches • Enclosure width 31 mm	
 With teflon plunger Slow-action contacts 1 NO + 1 NC	3SE5 232-0BC05
+	
Twist actuators	
 Twist actuators	3SE5 000-0AK00
 Twist levers High-grade steel lever, plastic roller	3SE5 000-0AA31

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 31 mm acc. to EN 50047




Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5¹⁾

Version	Contacts	LEDs	DT	Complete units		PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

Complete units²⁾ · Enclosure width 31 mm

Rounded plungers, type B, acc. to EN 50047							
 Rounded plungers	With teflon plunger						
	Slow-action contacts	1 NO + 1 NC	—	⤵ A	3SE5 232-0BC05	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⤵ B	3SE5 232-0CC05	1	1 unit
	Snap-action contacts, integrated ³⁾	1 NO + 1 NC	—	⤵ A	3SE5 232-0HC05	1	1 unit
	Snap-action contacts • Short stroke, integrated ³⁾	1 NO + 1 NC	—	⤵ B	3SE5 232-0FC05	1	1 unit
	Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	—	⤵ B	3SE5 232-0GC05	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⤵ A	3SE5 232-0KC05	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⤵ A	3SE5 232-0LC05	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⤵ ▶	3SE5 232-0MC05	1	1 unit
	Slow-action contacts	2 NO + 1 NC	—	⤵ A	3SE5 232-0PC05	1	1 unit
 With increased corrosion protection	With increased corrosion protection						
	Slow-action contacts	1 NO + 1 NC	—	⤵ B	3SE5 232-0BC05-1CA0	1	1 unit
	Snap-action contacts	1 NO + 1 NC	—	⤵ B	3SE5 232-0CC05-1CA0	1	1 unit
	Slow-action contacts	1 NO + 2 NC	—	⤵ B	3SE5 232-0KC05-1CA0	1	1 unit
	Snap-action contacts	1 NO + 2 NC	—	⤵ B	3SE5 232-0LC05-1CA0	1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⤵ B	3SE5 232-0MC05-1CA0	1	1 unit
	Slow-action contacts	2 NO + 1 NC	—	⤵ B	3SE5 232-0PC05-1CA0	1	1 unit
 With 2 LEDs	With M12 connector socket, 4-pole (250 V, 4 A)						
	Slow-action contacts	1 NO + 1 NC	—	⤵ B	3SE5 234-0BC05-1AC4	1	1 unit
	Snap-action contacts, integrated ³⁾	1 NO + 1 NC	—	⤵ A	3SE5 234-0HC05-1AC4	1	1 unit
	Slow-action contacts	2 NC	—	⤵ B	3SE5 234-0KC05-1AE0	1	1 unit
	Snap-action contacts	2 NC	—	⤵ A	3SE5 234-0LC05-1AE0	1	1 unit
	With 2 LEDs, yellow/green						
	Slow-action contacts	1 NO + 2 NC	24 V DC	⤵ B	3SE5 232-1KC05	1	1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	⤵ B	3SE5 232-1LC05	1	1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	⤵ B	3SE5 232-3KC05	1	1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	⤵ B	3SE5 232-3LC05	1	1 unit
	With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs						
	Slow-action contacts	1 NO + 1 NC	24 V DC	⤵ B	3SE5 234-1BC05-1AF3	1	1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	⤵ B	3SE5 234-1CC05-1AF3	1	1 unit

For online configurator see www.siemens.com/sirius/configurators.

⤵ Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ A cable gland with seal must be used with the quick-connect method.

²⁾ Popular versions.



³⁾ Subsequent replacement of contact blocks is not possible.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 31 mm acc. to EN 50047

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5¹⁾

Version	Contacts	LEDs	DT	Complete units		PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

Complete units²⁾ · Enclosure width 31 mm



Roller plunger

Roller plungers, type C acc. to EN 50047

With plastic roller 10 mm

Slow-action contacts	1 NO + 1 NC —	⊙ B	3SE5 232-0BD03	1	1 unit
Snap-action contacts • Integrated ³⁾	1 NO + 1 NC —	⊙ A	3SE5 232-0HD03	1	1 unit
Snap-action contacts • Short stroke, integrated ³⁾	1 NO + 1 NC —	⊙ B	3SE5 232-0FD03	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊙ B	3SE5 232-0KD03	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊙ ▶	3SE5 232-0LD03	1	1 unit

Actuator head rotated by 90°

Snap-action contacts	1 NO + 2 NC —	⊙ B	3SE5 232-0LD03-1AH0	1	1 unit
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With M12 connector socket, 4-pole (250 V, 4 A)

Snap-action contacts, integrated ³⁾	1 NO + 1 NC —	⊙ B	3SE5 234-0HD03-1AC4	1	1 unit
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Roller plungers with central fixing

Snap-action contacts, integrated ³⁾	1 NO + 1 NC —	⊙ B	3SE5 232-0HD10	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊙ B	3SE5 232-0KD10	1	1 unit



Roller plunger
with central fixing

Roller levers, type E acc. to EN 50047

With metal lever and plastic roller 13 mm

Slow-action contacts	1 NO + 1 NC —	⊙ ▶	3SE5 232-0BE10	1	1 unit
Snap-action contacts, integrated ³⁾	1 NO + 1 NC —	⊙ A	3SE5 232-0HE10	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊙ B	3SE5 232-0KE10	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊙ B	3SE5 232-0LE10	1	1 unit

With M12 connector socket, 4-pole (250 V, 4 A)

Snap-action contacts, integrated ³⁾	1 NO + 1 NC —	⊙ B	3SE5 234-0HE10-1AC4	1	1 unit
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Angular roller levers

With metal lever and plastic roller 13 mm

Slow-action contacts	1 NO + 1 NC —	⊙ ▶	3SE5 232-0BF10	1	1 unit
Snap-action contacts, integrated ³⁾	1 NO + 1 NC —	⊙ ▶	3SE5 232-0HF10	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊙ B	3SE5 232-0KF10	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊙ B	3SE5 232-0LF10	1	1 unit



Angular roller
lever

⚙ For online configurator see www.siemens.com/sirius/configurators.

⊙ Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ A cable gland with seal must be used with the quick-connect method.

²⁾ Popular versions.

³⁾ Subsequent replacement of contact blocks is not possible.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 31 mm acc. to EN 50047

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5¹⁾

Version	Contacts	LEDs	DT	Complete units		PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

Complete units²⁾ · Enclosure width 31 mm



Spring rod

Spring rods

Length 142.5 mm, with plastic plunger 50 mm

Snap-action contacts, integrated³⁾ 1 NO + 1 NC —

With M12 connector socket, 4-pole (250 V, 4 A)

Snap-action contacts, integrated³⁾ 1 NO + 1 NC —

Twist levers, type A acc. to EN 50047

With metal lever 21 mm and plastic roller 19 mm

Slow-action contacts 1 NO + 1 NC —

Snap-action contacts, integrated³⁾ 1 NO + 1 NC —

Slow-action contacts 1 NO + 2 NC —

Snap-action contacts 1 NO + 2 NC —

With M12 connector socket, 4-pole (250 V, 4 A)

Snap-action contacts, integrated³⁾ 1 NO + 1 NC —

With metal lever 35 mm and plastic roller 19 mm

Snap-action contacts, integrated³⁾ 1 NO + 1 NC —

Twist levers, adjustable length

With metal lever with grid hole and plastic roller 19 mm

Snap-action contacts, integrated³⁾ 1 NO + 1 NC —

With metal lever and plastic roller 19 mm

Slow-action contacts 1 NO + 1 NC —

Snap-action contacts, integrated³⁾ 1 NO + 1 NC —

Snap-action contacts 1 NO + 2 NC —

With M12 connector socket, 4-pole (250 V, 4 A)

Snap-action contacts, integrated³⁾ 1 NO + 1 NC —

Rod actuators

With aluminum rod, length 200 mm

Snap-action contacts, integrated³⁾ 1 NO + 1 NC —

With plastic rod, length 200 mm

Snap-action contacts, integrated³⁾ 1 NO + 1 NC —

With M12 connector socket, 4-pole (250 V, 4 A)

Snap-action contacts, integrated³⁾ 1 NO + 1 NC —



Twist lever



Twist lever,
adjustable length



Rod actuator

For online configurator see www.siemens.com/sirius/configurators.

Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ A cable gland with seal must be used with the quick-connect method.

²⁾ Popular versions.

³⁾ Subsequent replacement of contact blocks is not possible.

Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/13.

Limit Switches






SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 31 mm acc. to EN 50047

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Modular system

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5¹⁾

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	
Basic switches · Enclosure width 31 mm (with rounded plunger²⁾)						
 Basic switch	With teflon plunger					
	Slow-action contacts	1 NO + 1 NC	—	⊙ A	3SE5 232-0BC05	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊙ ▶	3SE5 232-0CC05	1 1 unit
	Snap-action contacts, integrated ³⁾	1 NO + 1 NC	—	⊙ ▶	3SE5 232-0HC05	1 1 unit
	Snap-action contacts • Short stroke, integrated ³⁾	1 NO + 1 NC	—	⊙ B	3SE5 232-0FC05	1 1 unit
	Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	—	⊙ B	3SE5 232-0GC05	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊙ A	3SE5 232-0KC05	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊙ ▶	3SE5 232-0LC05	1 1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊙ A	3SE5 232-0MC05	1 1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊙ A	3SE5 232-0PC05	1 1 unit
 With increased corrosion protection	With increased corrosion protection⁴⁾					
	Slow-action contacts	1 NO + 1 NC	—	⊙ B	3SE5 232-0BC05-1CA0	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊙ B	3SE5 232-0CC05-1CA0	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊙ B	3SE5 232-0KC05-1CA0	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊙ B	3SE5 232-0LC05-1CA0	1 1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊙ B	3SE5 232-0MC05-1CA0	1 1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊙ B	3SE5 232-0PC05-1CA0	1 1 unit
 With M12 socket	With M12 connector socket, 4-pole (250 V, 4 A)					
	Slow-action contacts	1 NO + 1 NC	—	⊙ B	3SE5 234-0BC05-1AC4	1 1 unit
	Snap-action contacts, integrated ³⁾	1 NO + 1 NC	—	⊙ A	3SE5 234-0HC05-1AC4	1 1 unit
	Slow-action contacts	2 NC	—	⊙ B	3SE5 234-0KC05-1AE0	1 1 unit
	Snap-action contacts	2 NC	—	⊙ A	3SE5 234-0LC05-1AE0	1 1 unit
 With 2 LEDs	With 2 LEDs, yellow/green					
	Slow-action contacts	1 NO + 2 NC	24 V DC	⊙ B	3SE5 232-1KC05	1 1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	⊙ B	3SE5 232-1LC05	1 1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	⊙ B	3SE5 232-3KC05	1 1 unit
 With M12 socket and 2 LEDs	With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs					
	Slow-action contacts	1 NO + 1 NC	24 V DC	⊙ B	3SE5 234-1BC05-1AF3	1 1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	⊙ B	3SE5 234-1CC05-1AF3	1 1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators.

⊙ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

¹⁾ A cable gland with seal must be used with the quick-connect method.

²⁾ For enclosures with widths of 31mm, the basic switch is a complete unit with rounded plungers.

³⁾ Subsequent replacement of contact blocks is not possible.

⁴⁾ Use corresponding high-grade steel lever.






































Note:

Selection aid see page 13/9.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 31 mm acc. to EN 50047

Version	Diameter	DT	Modular system		PU (UNIT, SET, M)	PS*
mm			Order No.	Price per PU		
Operating mechanisms						
 Roller plunger	Roller plungers, type C acc. to EN 50047					
	Plastic rollers	10	 ➤	3SE5 000-0AD03	1	1 unit
	High-grade steel rollers	10	 B	3SE5 000-0AD04	1	1 unit
 With central fixing	Roller plungers with central fixing					
	Plastic rollers	10	 B	3SE5 000-0AD10	1	1 unit
	High-grade steel rollers	10	 B	3SE5 000-0AD11	1	1 unit
 Roller lever	Roller levers, type E acc. to EN 50047					
	Metal lever, plastic roller	13	 ➤	3SE5 000-0AE10	1	1 unit
	Metal lever, high-grade steel roller	13	 ➤	3SE5 000-0AE11	1	1 unit
	High-grade steel lever, plastic roller	13	 B	3SE5 000-0AE12	1	1 unit
	High-grade steel lever, high-grade steel roller	13	 B	3SE5 000-0AE13	1	1 unit
 Angular roller lever	Angular roller levers					
	Metal lever, plastic roller	13	 ➤	3SE5 000-0AF10	1	1 unit
	Metal lever, high-grade steel roller	13	 B	3SE5 000-0AF11	1	1 unit
	High-grade steel lever, plastic roller	13	 A	3SE5 000-0AF12	1	1 unit
	High-grade steel lever, high-grade steel roller	13	 B	3SE5 000-0AF13	1	1 unit
 Spring rod	Spring rods (for switches with snap-action contacts only)					
	Plastic plunger and high-grade steel spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		➤	3SE5 000-0AR01	1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		➤	3SE5 000-0AR03	1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	3SE5 000-0AR04	1	1 unit
	High-grade steel plunger and spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR02	1	1 unit
Twist actuators						
 Twist actuator	Twist actuators, plastic (without lever)					
	Switching right and/or left, adjustable		 ➤	3SE5 000-0AK00	1	1 unit
 Twist lever	Levers for twist actuators					
	Twist levers 21 mm, straight, type A acc. to EN 50047					
	Metal lever, plastic roller	19	 ➤	3SE5 000-0AA21	1	1 unit
	Metal lever, high-grade steel roller	19	 B	3SE5 000-0AA22	1	1 unit
	Metal lever, roller with ball bearing	19	 B	3SE5 000-0AA23	1	1 unit
	Metal lever, plastic roller	30	 B	3SE5 000-0AA25	1	1 unit
	High-grade steel lever, plastic roller	19	 B	3SE5 000-0AA31	1	1 unit
	High-grade steel lever, high-grade steel roller	19	 B	3SE5 000-0AA32	1	1 unit
 Twist levers 30 mm, straight ¹⁾	Twist levers 30 mm, straight¹⁾					
	Metal lever, plastic roller	19	 B	3SE5 000-0AA24	1	1 unit
 Twist levers, adjustable length, with grid hole	Twist levers, adjustable length, with grid hole					
	Metal lever, plastic roller	19	 ➤	3SE5 000-0AA60	1	1 unit
	Metal lever, high-grade steel roller	19	 ➤	3SE5 000-0AA61	1	1 unit
	Metal lever, plastic roller	50	 B	3SE5 000-0AA67	1	1 unit
	Metal lever, rubber roller	50	 B	3SE5 000-0AA68	1	1 unit
	High-grade steel lever, plastic roller	19	 B	3SE5 000-0AA62	1	1 unit
	High-grade steel lever, high-grade steel roller	19	 B	3SE5 000-0AA63	1	1 unit
	 Twist levers, adjustable length	Twist levers, adjustable length				
Metal lever, plastic roller		19	A	3SE5 000-0AA50	1	1 unit
Metal lever, high-grade steel roller		19	B	3SE5 000-0AA51	1	1 unit
Metal lever, plastic roller		30	B	3SE5 000-0AA55	1	1 unit
Metal lever, plastic roller		50	B	3SE5 000-0AA57	1	1 unit
Metal lever, rubber roller		50	B	3SE5 000-0AA58	1	1 unit
High-grade steel lever, plastic roller		19	B	3SE5 000-0AA52	1	1 unit
High-grade steel lever, high-grade steel roller		19	B	3SE5 000-0AA53	1	1 unit
Rod actuators						
Aluminum rod, length 200 mm		6	➤	3SE5 000-0AA80	1	1 unit
Spring rod, length 200 mm	6	B	3SE5 000-0AA81	1	1 unit	
Plastic rod, length 200 mm	6	➤	3SE5 000-0AA82	1	1 unit	

➔ Positively driven actuator, necessary in safety circuits.

¹⁾ Can be clinch mounted (turned through 180°, rear of lever).

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 40 mm acc. to EN 50041

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP66/67 · Cable entry M20 x 1.5

Version	Contacts	LEDs	DT	Complete units	Configurator	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
Complete units¹⁾ · Enclosure width 40 mm									
Plain plungers									
 Plain plunger	With high-grade steel plunger								
	Slow-action contacts	1 NO + 1 NC —	⊕ B	3SE5 132-0BB01				1	1 unit
	Snap-action contacts	1 NO + 1 NC —	⊕ B	3SE5 132-0CB01				1	1 unit
	Slow-action contacts	1 NO + 2 NC —	⊕ B	3SE5 132-0KB01				1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊕ B	3SE5 132-0LB01				1	1 unit
	Slow-action contacts	2 NO + 1 NC —	⊕ B	3SE5 132-0PB01				1	1 unit
Rounded plungers, type B acc. to EN 50041									
 Rounded plunger	With plastic plunger								
	Slow-action contacts	1 NO + 1 NC —	⊕ A	3SE5 132-0BC03				1	1 unit
	Snap-action contacts	1 NO + 1 NC —	⊕ A	3SE5 132-0CC03				1	1 unit
	Slow-action contacts	1 NO + 2 NC —	⊕ B	3SE5 132-0KC03				1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊕ B	3SE5 132-0LC03				1	1 unit
	Slow-action contacts	2 NO + 1 NC —	⊕ B	3SE5 132-0PC03				1	1 unit
Roller plungers, type C acc. to EN 50041									
 Roller plunger	With plastic roller 13 mm								
	Slow-action contacts	1 NO + 1 NC —	⊕ B	3SE5 132-0BD05				1	1 unit
	Snap-action contacts	1 NO + 1 NC —	⊕ A	3SE5 132-0CD05				1	1 unit
	Slow-action contacts	1 NO + 2 NC —	⊕ B	3SE5 132-0KD05				1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊕ B	3SE5 132-0LD05				1	1 unit
	Slow-action contacts	2 NO + 1 NC —	⊕ B	3SE5 132-0PD05				1	1 unit
Roller levers									
 Roller lever	With metal lever and plastic roller 22 mm								
	Slow-action contacts	1 NO + 1 NC —	⊕ B	3SE5 132-0BE05				1	1 unit
	Snap-action contacts	1 NO + 1 NC —	⊕ A	3SE5 132-0CE05				1	1 unit
	Slow-action contacts	1 NO + 2 NC —	⊕ B	3SE5 132-0KE05				1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊕ B	3SE5 132-0LE05				1	1 unit
	Slow-action contacts	2 NO + 1 NC —	⊕ B	3SE5 132-0PE05				1	1 unit
Angular roller levers									
 Angular roller lever	With metal lever and plastic roller 22 mm								
	Slow-action contacts	1 NO + 1 NC —	⊕ B	3SE5 132-0BF05				1	1 unit
	Snap-action contacts	1 NO + 1 NC —	⊕ B	3SE5 132-0CF05				1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊕ B	3SE5 132-0LF05				1	1 unit
Spring rods									
 Spring rod	Length 142.5 mm, with plastic plunger 50 mm								
	Snap-action contacts	1 NO + 1 NC —	B	3SE5 132-0CR01				1	1 unit
	Snap-action contacts	1 NO + 2 NC —	B	3SE5 132-0LR01				1	1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators.

⊕ Positive opening according to IEC 60947-5-1, Appendix K.






¹⁾ Popular versions.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 40 mm acc. to EN 50041

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	Configurator	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
Complete units¹⁾ · Enclosure width 40 mm									
	Twist levers, type A acc. to EN 50041								
	With metal lever 27 mm and plastic roller 19 mm								
	Slow-action contacts	1 NO + 1 NC —	⊙ A	3SE5 132-0BJ01				1	1 unit
	Snap-action contacts	1 NO + 1 NC —	⊙ ▶	3SE5 132-0CJ01				1	1 unit
	Slow-action contacts	1 NO + 2 NC —	⊙ B	3SE5 132-0KJ01				1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⊙ B	3SE5 132-0LJ01				1	1 unit
	Slow-action contacts	2 NO + 1 NC —	⊙ B	3SE5 132-0PJ01				1	1 unit
	Twist levers, adjustable length								
	With metal lever with grid hole and plastic roller 19 mm								
	Snap-action contacts	1 NO + 1 NC —	⊙ B	3SE5 132-0CJ60				1	1 unit
	With metal lever and plastic roller 19 mm								
	Snap-action contacts	1 NO + 1 NC —	A	3SE5 132-0CJ50				1	1 unit
	Snap-action contacts	1 NO + 2 NC —	B	3SE5 132-0LJ50				1	1 unit
	Rod actuators, type D, acc. to EN 50041								
	With aluminum rod, length 200 mm								
	Snap-action contacts	1 NO + 1 NC —	B	3SE5 132-0CJ80				1	1 unit
	With plastic rod, length 200 mm								
	Snap-action contacts	1 NO + 1 NC —	A	3SE5 132-0CJ82				1	1 unit

For online configurator see www.siemens.com/sirius/configurators.

Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ Popular versions.

Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/17.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 40 mm acc. to EN 50041

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Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system		PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

Basic switches · Enclosure width 40 mm



With M20 × 1.5 connecting thread

Slow-action contacts	1 NO + 1 NC	—	⌚ B	3SE5 132-0BA00	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⌚ A	3SE5 132-0CA00	1	1 unit
• Gold-plated contacts			⌚ B	3SE5 132-0CA00-1AC1	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⌚ B	3SE5 132-0KA00	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⌚ B	3SE5 132-0LA00	1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	⌚ B	3SE5 132-0MA00	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⌚ B	3SE5 132-0PA00	1	1 unit



With increased corrosion protection¹⁾

Slow-action contacts	1 NO + 1 NC	—	⌚ B	3SE5 132-0BA00-1CA0	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⌚ B	3SE5 132-0CA00-1CA0	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⌚ B	3SE5 132-0KA00-1CA0	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⌚ B	3SE5 132-0LA00-1CA0	1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	⌚ B	3SE5 132-0MA00-1CA0	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⌚ B	3SE5 132-0PA00-1CA0	1	1 unit



With M12 connector socket, 4-pole (250 V, 4 A)

Slow-action contacts	1 NO + 1 NC	—	⌚ B	3SE5 134-0BA00-1AC4	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⌚ B	3SE5 134-0CA00-1AC4	1	1 unit
Slow-action contacts	2 NC	—	⌚ B	3SE5 134-0KA00-1AE0	1	1 unit
Snap-action contacts	2 NC	—	⌚ B	3SE5 134-0LA00-1AE0	1	1 unit



With 2 LEDs, yellow/green

Slow-action contacts	1 NO + 2 NC	24 V DC	⌚ C	3SE5 132-1KA00	1	1 unit
Snap-action contacts	1 NO + 2 NC	24 V DC	⌚ C	3SE5 132-1LA00	1	1 unit
Slow-action contacts	1 NO + 2 NC	230 V AC	⌚ C	3SE5 132-3KA00	1	1 unit
Snap-action contacts	1 NO + 2 NC	230 V AC	⌚ C	3SE5 132-3LA00	1	1 unit

For online configurator see www.siemens.com/sirius/configurators.

Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

¹⁾ Use corresponding high-grade steel lever.












Note:

Selection aid [see page 13/9](#).

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 40 mm acc. to EN 50041

Version	Diameter	DT	Modular system		PU (UNIT, SET, M)	PS*
mm			Order No.	Price per PU		
Operating mechanisms						
 Plain plunger	Plain plungers					
	High-grade steel plungers	10	⊕ A	3SE5 000-0AB01	1	1 unit
 Plunger	Rounded plungers, type B acc. to EN 50041					
	Plastic plungers	10	⊕ B	3SE5 000-0AC03	1	1 unit
	Roller plungers, type C acc. to EN 50041					
	Plastic plunger, plastic roller	13	⊕ B	3SE5 000-0AD05	1	1 unit
 Roller lever	Plastic plunger, high-grade steel roller	13	⊕ B	3SE5 000-0AD06	1	1 unit
	Roller levers					
 Angular roller lever	Metal lever with plastic roller, plastic base	22	⊕ B	3SE5 000-0AE05	1	1 unit
	Angular roller levers					
 Spring rod	Metal lever with plastic roller, plastic base	22	⊕ B	3SE5 000-0AF05	1	1 unit
	Spring rods (for switches with snap-action contacts only)					
 Spring rod	Plastic plunger and high-grade steel spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR01	1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	3SE5 000-0AR03	1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	3SE5 000-0AR04	1	1 unit
	High-grade steel plunger and spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR02	1	1 unit
Twist actuators						
 Twist actuator	Twist actuators, plastic (without lever)					
	• For twist levers and rod actuators, switching right and/or left, adjustable		⊕ B	3SE5 000-0AJ00	1	1 unit
 Twist lever	Levers for twist actuators					
	Twist levers, offset, type A acc. to EN 50041					
	Metal lever 27 mm, plastic roller	19	⊕ ▶	3SE5 000-0AA01	1	1 unit
	Metal lever 27 mm, high-grade steel roller	19	⊕ ▶	3SE5 000-0AA02	1	1 unit
	Metal lever 27 mm, roller with ball bearing	19	⊕ B	3SE5 000-0AA03	1	1 unit
	Metal lever 27 mm, 2 plastic rollers	19	⊕ ▶	3SE5 000-0AA04	1	1 unit
	Metal lever 27 mm, plastic roller	30	⊕ B	3SE5 000-0AA05	1	1 unit
	Metal lever 27 mm, rubber roller	50	⊕ ▶	3SE5 000-0AA08	1	1 unit
	High-grade steel lever 27 mm, plastic roller	19	⊕ B	3SE5 000-0AA11	1	1 unit
	High-grade steel lever 27 mm, high-grade steel roller	19	⊕ ▶	3SE5 000-0AA12	1	1 unit
	Metal lever 35 mm, plastic roller	19	⊕ B	3SE5 000-0AA15	1	1 unit
	Twist levers 30 mm, straight ¹⁾					
	Metal lever, plastic roller	19	⊕ B	3SE5 000-0AA24	1	1 unit
	Metal lever, plastic roller	30	⊕ B	3SE5 000-0AA26	1	1 unit
 Twist lever, adjustable length	Twist levers, adjustable length, with grid hole					
	Metal lever, plastic roller	19	⊕ B	3SE5 000-0AA60	1	1 unit
	Metal lever, high-grade steel roller	19	⊕ B	3SE5 000-0AA61	1	1 unit
	Metal lever, rubber roller	50	⊕ B	3SE5 000-0AA68	1	1 unit
	High-grade steel lever, plastic roller	19	⊕ B	3SE5 000-0AA62	1	1 unit
	High-grade steel lever, high-grade steel roller	19	⊕ B	3SE5 000-0AA63	1	1 unit
 Rod actuator	Twist levers, adjustable length					
	Metal lever, plastic roller	19	A	3SE5 000-0AA50	1	1 unit
	Metal lever, high-grade steel roller	19	B	3SE5 000-0AA51	1	1 unit
	Metal lever, plastic roller	30	B	3SE5 000-0AA55	1	1 unit
	Metal lever, rubber roller	50	B	3SE5 000-0AA58	1	1 unit
	High-grade steel lever, plastic roller	19	B	3SE5 000-0AA52	1	1 unit
	High-grade steel lever, high-grade steel roller	19	B	3SE5 000-0AA53	1	1 unit
	Rod actuators, type D acc. to EN 50041					
	Aluminum rod, length 200 mm	6	B	3SE5 000-0AA80	1	1 unit
	Spring rod, length 200 mm	6	B	3SE5 000-0AA81	1	1 unit
	Plastic rod, length 200 mm	6	B	3SE5 000-0AA82	1	1 unit

⊕ Positively driven actuator, necessary in safety circuits.

¹⁾ Can be clinch mounted (turned through 180°, rear of lever).

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 50 mm

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 2 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	

Complete units¹⁾ · Enclosure width 50 mm



Rounded plunger

Rounded plungers

With teflon plunger

Slow-action contacts	1 NO + 1 NC	—	➞ ➞	3SE5 242-0BC05	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	➞ B	3SE5 242-0CC05	1	1 unit
Snap-action contacts, integrated ²⁾	1 NO + 1 NC	—	➞ ➞	3SE5 242-0HC05	1	1 unit
Snap-action contacts • Short stroke, integrated ²⁾	1 NO + 1 NC	—	➞ B	3SE5 242-0FC05	1	1 unit
Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	—	➞ B	3SE5 242-0GC05	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	➞ B	3SE5 242-0KC05	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	➞ B	3SE5 242-0LC05	1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	➞ A	3SE5 242-0MC05	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	➞ A	3SE5 242-0PC05	1	1 unit



With increased corrosion protection

With increased corrosion protection

Slow-action contacts	1 NO + 1 NC	—	➞ B	3SE5 242-0BC05-1CA0	1	1 unit
Snap-action contacts, integrated ²⁾	1 NO + 1 NC	—	➞ B	3SE5 242-0HC05-1CA0	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	➞ B	3SE5 242-0KC05-1CA0	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	➞ B	3SE5 242-0LC05-1CA0	1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	➞ B	3SE5 242-0MC05-1CA0	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	➞ B	3SE5 242-0PC05-1CA0	1	1 unit



With 2 LEDs

With 2 LEDs, yellow/green

Slow-action contacts	1 NO + 2 NC	24 V DC	➞ B	3SE5 242-1KC05	1	1 unit
Snap-action contacts	1 NO + 2 NC	24 V DC	➞ B	3SE5 242-1LC05	1	1 unit
Slow-action contacts	1 NO + 2 NC	230 V AC	➞ B	3SE5 242-3KC05	1	1 unit
Snap-action contacts	1 NO + 2 NC	230 V AC	➞ B	3SE5 242-3LC05	1	1 unit



Roller plunger

Roller plungers

With plastic roller 10 mm

Slow-action contacts	1 NO + 1 NC	—	➞ ➞	3SE5 242-0BD03	1	1 unit
Snap-action contacts, integrated ²⁾	1 NO + 1 NC	—	➞ ➞	3SE5 242-0HD03	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	➞ ➞	3SE5 242-0LD03	1	1 unit

For online configurator see www.siemens.com/sirius/configurators.

➞ Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ Popular versions.



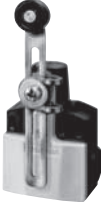
²⁾ Subsequent replacement of contact blocks is not possible.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 50 mm

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 2 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Complete units	Configurator	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
Complete units¹⁾ · Enclosure width 50 mm									
 Roller lever	Roller levers								
	With metal lever and plastic roller 13 mm								
	Slow-action contacts	1 NO + 1 NC —	⤵ B	3SE5 242-0BE10				1	1 unit
	Snap-action contacts, integrated ²⁾	1 NO + 1 NC —	⤵ ▶	3SE5 242-0HE10				1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⤵ B	3SE5 242-0LE10				1	1 unit
 Twist lever	With M12 connector socket, 4-pole right (250 V, 4 A)								
	Snap-action contacts	2 NC —	⤵ B	3SE5 244-0LE10-1AE0				1	1 unit
	Twist levers								
	With metal lever 21 mm and plastic roller 19 mm								
	Slow-action contacts	1 NO + 1 NC —	⤵ B	3SE5 242-0BK21				1	1 unit
 Twist lever, adjustable length	Snap-action contacts, integrated ²⁾	1 NO + 1 NC —	⤵ ▶	3SE5 242-0HK21				1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⤵ B	3SE5 242-0LK21				1	1 unit
	Twist levers, adjustable length								
	With metal lever and plastic roller 19 mm								
	Snap-action contacts, integrated ²⁾	1 NO + 1 NC —	B	3SE5 242-0HK50				1	1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators.

⤵ Positive opening according to IEC 60947-5-1, Appendix K.

1) Popular versions.

2) Subsequent replacement of contact blocks is not possible.

Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/21.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 50 mm

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 2 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	

Basic switches · Enclosure width 50 mm (with rounded plunger¹⁾)



Basic switches

With teflon plunger

Slow-action contacts	1 NO + 1 NC	—	⊙ ➤	3SE5 242-0BC05	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊙ B	3SE5 242-0CC05	1	1 unit
Snap-action contacts, integrated ²⁾	1 NO + 1 NC	—	⊙ ➤	3SE5 242-0HC05	1	1 unit
Snap-action contacts • Short stroke, integrated ²⁾	1 NO + 1 NC	—	⊙ B	3SE5 242-0FC05	1	1 unit
Snap-action contacts • 2 × 2 mm contact gap	1 NO + 1 NC	—	⊙ B	3SE5 242-0GC05	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊙ B	3SE5 242-0KC05	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊙ B	3SE5 242-0LC05	1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊙ A	3SE5 242-0MC05	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊙ A	3SE5 242-0PC05	1	1 unit



With increased corrosion protection

With increased corrosion protection³⁾

Slow-action contacts	1 NO + 1 NC	—	⊙ B	3SE5 242-0BC05-1CA0	1	1 unit
Snap-action contacts, integrated ²⁾	1 NO + 1 NC	—	⊙ B	3SE5 242-0HC05-1CA0	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊙ B	3SE5 242-0KC05-1CA0	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊙ B	3SE5 242-0LC05-1CA0	1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊙ B	3SE5 242-0MC05-1CA0	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	⊙ B	3SE5 242-0PC05-1CA0	1	1 unit



With 2 LEDs

With 2 LEDs, yellow/green

Slow-action contacts	1 NO + 2 NC	24 V DC	⊙ B	3SE5 242-1KC05	1	1 unit
Snap-action contacts	1 NO + 2 NC	24 V DC	⊙ B	3SE5 242-1LC05	1	1 unit
Slow-action contacts	1 NO + 2 NC	230 V AC	⊙ B	3SE5 242-3KC05	1	1 unit
Snap-action contacts	1 NO + 2 NC	230 V AC	⊙ B	3SE5 242-3LC05	1	1 unit

For online configurator see www.siemens.com/sirius/configurators.

⊙ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

¹⁾ For enclosures with widths of 50 mm, the basic switch is a complete unit with rounded plungers.

²⁾ Subsequent replacement of contact blocks is not possible.

³⁾ Use corresponding high-grade steel lever.

Note:

Selection aid see page 13/9.

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU	

Operating mechanisms



Roller plungers

Roller plungers, type C acc. to EN 50047

Plastic rollers	10	⊙ A	3SE5 000-0AD03	1	1 unit
High-grade steel rollers	10	⊙ B	3SE5 000-0AD04	1	1 unit



With central fixing

Roller plungers with central fixing










Plastic rollers	10	⊙ B	3SE5 000-0AD10	1	1 unit
High-grade steel rollers	10	⊙ B	3SE5 000-0AD11	1	1 unit

⊙ Positively driven actuator, necessary in safety circuits.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure width 50 mm

Version	Diameter	DT	Modular system		PU (UNIT, SET, M)	PS*
mm			Order No.	Price per PU		
Operating mechanisms						
	Roller levers, type E acc. to EN 50047					
	Metal lever, plastic roller	13	⊙ A	3SE5 000-0AE10	1	1 unit
	Metal lever, high-grade steel roller	13	⊙ B	3SE5 000-0AE11	1	1 unit
	High-grade steel lever, plastic roller	13	⊙ B	3SE5 000-0AE12	1	1 unit
	High-grade steel lever, high-grade steel roller	13	⊙ B	3SE5 000-0AE13	1	1 unit
	Angular roller levers					
	Metal lever, plastic roller	13	⊙ A	3SE5 000-0AF10	1	1 unit
	Metal lever, high-grade steel roller	13	⊙ B	3SE5 000-0AF11	1	1 unit
	High-grade steel lever, plastic roller	13	⊙ A	3SE5 000-0AF12	1	1 unit
	High-grade steel lever, high-grade steel roller	13	⊙ B	3SE5 000-0AF13	1	1 unit
	Spring rods (for switches with snap-action contacts only)					
	Plastic plunger and high-grade steel spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR01	1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	3SE5 000-0AR03	1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	3SE5 000-0AR04	1	1 unit
	High-grade steel plunger and spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR02	1	1 unit
	Twist actuators					
	Twist actuators, plastic (without lever)					
	Switching right and/or left, adjustable		⊙ A	3SE5 000-0AK00	1	1 unit
	Levers for twist actuators					
	Twist levers 21 mm, straight, type A acc. to EN 50047					
	Metal lever, plastic roller	19	⊙ A	3SE5 000-0AA21	1	1 unit
	Metal lever, high-grade steel roller	19	⊙ B	3SE5 000-0AA22	1	1 unit
	Metal lever, roller with ball bearing	19	⊙ B	3SE5 000-0AA23	1	1 unit
	Metal lever, plastic roller	30	⊙ B	3SE5 000-0AA25	1	1 unit
	High-grade steel lever, plastic roller	19	⊙ B	3SE5 000-0AA31	1	1 unit
	High-grade steel lever, high-grade steel roller	19	⊙ B	3SE5 000-0AA32	1	1 unit
	Twist levers 30 mm, straight ¹⁾					
	Metal lever, plastic roller	19	⊙ B	3SE5 000-0AA24	1	1 unit
	Metal lever, plastic roller	30	⊙ B	3SE5 000-0AA26	1	1 unit
	Twist levers, adjustable length, with grid hole					
	Metal lever, plastic roller	19	⊙ B	3SE5 000-0AA60	1	1 unit
	Metal lever, high-grade steel roller	19	⊙ B	3SE5 000-0AA61	1	1 unit
	Metal lever, plastic roller	50	⊙ B	3SE5 000-0AA67	1	1 unit
	Metal lever, rubber roller	50	⊙ B	3SE5 000-0AA68	1	1 unit
	High-grade steel lever, plastic roller	19	⊙ B	3SE5 000-0AA62	1	1 unit
	High-grade steel lever, high-grade steel roller	19	⊙ B	3SE5 000-0AA63	1	1 unit
	Twist levers, adjustable length					
	Metal lever, plastic roller	19	A	3SE5 000-0AA50	1	1 unit
	Metal lever, high-grade steel roller	19	B	3SE5 000-0AA51	1	1 unit
	Metal lever, plastic roller	30	B	3SE5 000-0AA55	1	1 unit
	Metal lever, plastic roller	50	B	3SE5 000-0AA57	1	1 unit
	Metal lever, rubber roller	50	B	3SE5 000-0AA58	1	1 unit
High-grade steel lever, plastic roller	19	B	3SE5 000-0AA52	1	1 unit	
High-grade steel lever, high-grade steel roller	19	B	3SE5 000-0AA53	1	1 unit	
Rod actuators						
Aluminum rod, length 200 mm	6	B	3SE5 000-0AA80	1	1 unit	
Spring rod, length 200 mm	6	B	3SE5 000-0AA81	1	1 unit	
Plastic rod, length 200 mm	6	B	3SE5 000-0AA82	1	1 unit	

⊙ Positively driven actuator, necessary in safety circuits.

¹⁾ Can be clinch mounted (turned through 180°, rear of lever).

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Ambient temperature to -40 °C

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12
13

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP65 or IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*	PG
				Configurator				
				Order No.	Price per PU			

Complete units¹⁾ · Enclosure width 31 mm



Roller plunger
with central
fixing

Roller plungers with central fixing

Snap-action contacts 1 NO + 1 NC — B 3SE5 232-0CD10-1AJ0 1 1 unit 41K



Twist lever

Twist levers, type A acc. to EN 50047

With high-grade steel lever 21 mm and plastic roller 19 mm

Snap-action contacts 1 NO + 1 NC — A 3SE5 232-0CK31-1AJ0 1 1 unit 41K



Twist lever,
adjustable
length

Twist levers, adjustable length

With high-grade steel lever with grid hole
and plastic roller 19 mm

Snap-action contacts 1 NO + 1 NC — A 3SE5 232-0CK62-1AJ0 1 1 unit 41K

Snap-action contacts 1 NO + 2 NC — B 3SE5 232-0LK62-1AJ0 1 1 unit 41K

Complete units¹⁾ · Enclosure width 50 mm



Twist lever,
adjustable
length

Twist levers

With metal lever 21 mm and plastic roller 19 mm

Snap-action contacts, integrated²⁾ 1 NO + 1 NC — B 3SE5 242-0HK21-1AJ0 1 1 unit 41K

Twist levers, adjustable length

With high-grade steel lever with grid hole and plastic roller
19 mm

Snap-action contacts, integrated²⁾ 1 NO + 1 NC — B 3SE5 242-0HK62-1AJ0 1 1 unit 41K

For online configurator see www.siemens.com/sirius/configurators.

Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

¹⁾ Popular versions.

²⁾ Subsequent replacement of contact blocks is not possible.

Note:

If the device you require is not available as a complete unit, see "Modular System", see page 13/24.



Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Ambient temperature to -40 °C

Modular system

2 or 3 contacts · Degree of protection IP65 or IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	
Basic switches · Enclosure width 31 mm (with rounded plunger¹⁾)						
	With teflon plunger					
	Snap-action contacts	1 NO + 1 NC —	⤵ B	3SE5 232-0CC05-1AJ0	1	1 unit
	Slow-action contacts	1 NO + 2 NC —	⤵ B	3SE5 232-0KC05-1AJ0	1	1 unit
	Snap-action contacts	1 NO + 2 NC —	⤵ B	3SE5 232-0LC05-1AJ0	1	1 unit
Basic switches · Enclosure width 50 mm (with rounded plunger¹⁾)						
	With teflon plunger					
	Slow-action contacts	1 NO + 1 NC —	⤵ B	3SE5 242-0BC05-1AJ0	1	1 unit
	Snap-action contacts, integrated ²⁾	1 NO + 1 NC —	⤵ B	3SE5 242-0HC05-1AJ0	1	1 unit

Basic switch

Basic switch

⚙ For online configurator see www.siemens.com/sirius/configurators.

⤵ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

¹⁾ For enclosures with widths of 31 and 50 mm, the basic switch is a complete unit with rounded plungers.

²⁾ Subsequent replacement of contact blocks is not possible.







Note:

Selection aid [see page 13/9](#).

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Ambient temperature to -40 °C

Version	Diameter	DT	Modular system	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
	mm						
Operating mechanisms							
 Roller plunger	Roller plungers, type C acc. to EN 50047						
	Plastic rollers	10	→ B	3SE5 000-0AD03-1AJ0		1	1 unit
 Roller lever	Roller levers, type E acc. to EN 50047						
	Metal lever, plastic roller	13	→ B	3SE5 000-0AE10-1AJ0		1	1 unit
	High-grade steel lever, plastic roller	13	→ B	3SE5 000-0AE12-1AJ0		1	1 unit
 Angular roller lever	Angular roller levers						
	Metal lever, plastic roller	13	→ B	3SE5 000-0AF10-1AJ0		1	1 unit
	High-grade steel lever, plastic roller	13	→ B	3SE5 000-0AF12-1AJ0		1	1 unit
Twist actuators							
 Twist actuator	Twist actuators, plastic (without lever)						
	Switching right and/or left, adjustable		→ B	3SE5 000-0AK00-1AJ0		1	1 unit
Levers for twist actuators							
 Twist lever	Twist levers straight, 21 mm, type A acc. to EN 50047						
	Metal lever, plastic roller	19	→ B	3SE5 000-0AA21-1AJ0		1	1 unit
	High-grade steel lever, plastic roller	19	→ B	3SE5 000-0AA31-1AJ0		1	1 unit
 Twist lever, adjustable length	Twist levers, adjustable length, with grid hole						
	Metal lever, plastic roller	19	→ B	3SE5 000-0AA60-1AJ0		1	1 unit
	High-grade steel lever, plastic roller	19	→ B	3SE5 000-0AA62-1AJ0		1	1 unit

→ Positively driven actuator, necessary in safety circuits.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Ambient temperature to -40 °C

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	

Basic switches · Enclosure width 40 mm



With M20 □ 1.5 connecting thread

Snap-action contacts	1 NO + 1 NC —	⊙ B	3SE5 132-0CA00-1AJ0	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊙ B	3SE5 132-0KA00-1AJ0	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊙ B	3SE5 132-0LA00-1AJ0	1	1 unit

Basic switch

For online configurator see www.siemens.com/sirius/configurators.

⊙ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

Note:

Selection aid [see page 13/9](#).

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU	

Operating mechanisms



Rounded plungers, type B acc. to EN 50041

Plastic plunger	10	⊙ B	3SE5 000-0AC03-1AJ0	1	1 unit
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Rounded plunger



Roller plungers, type C acc. to EN 50041

Plastic plunger, plastic roller	13	⊙ B	3SE5 000-0AD05-1AJ0	1	1 unit
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Roller plunger



Roller levers

Metal lever with plastic roller, plastic base	22	⊙ B	3SE5 000-0AE05-1AJ0	1	1 unit
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Roller lever

Twist actuators



Twist actuators, plastic (without lever)

• For twist levers and rod actuators, switching right and/or left, adjustable		⊙ B	3SE5 000-0AJ00-1AJ0	1	1 unit
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Twist actuator

Levers for twist actuators

Twist lever, type A acc. to EN 50041

Metal lever, plastic roller	19	⊙ B	3SE5 000-0AA01-1AJ0	1	1 unit
High-grade steel lever, plastic roller	19	⊙ B	3SE5 000-0AA11-1AJ0	1	1 unit

Twist levers



Twist levers, adjustable length, with grid hole

Metal lever, plastic roller	19	⊙ B	3SE5 000-0AA60-1AJ0	1	1 unit
High-grade steel lever, plastic roller	19	⊙ B	3SE5 000-0AA62-1AJ0	1	1 unit

Twist lever, adjustable length

⊙ Positively driven actuator, necessary in safety circuits.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 31 mm acc. to EN 50047






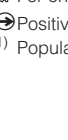
Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	

Complete units¹⁾ · Enclosure width 31 mm

Rounded plungers, type B, acc. to EN 50047						
 Rounded plunger	With plunger					
	Slow-action contacts	1 NO + 1 NC	—	⊕ A	3SE5 212-0BC05	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ A	3SE5 212-0CC05	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ A	3SE5 212-0KC05	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ A	3SE5 212-0LC05	1 1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ A	3SE5 212-0MC05	1 1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊕ A	3SE5 212-0PC05	1 1 unit
 With increased corrosion protection	With increased corrosion protection					
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 212-0BC05-1CA0	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 212-0CC05-1CA0	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0KC05-1CA0	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0LC05-1CA0	1 1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ B	3SE5 212-0MC05-1CA0	1 1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊕ B	3SE5 212-0PC05-1CA0	1 1 unit
 With 2 LEDs	With M12 connector socket, 5-pole (125 V, 4 A)					
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 214-0BC05-1AC5	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 214-0CC05-1AC5	1 1 unit
	Slow-action contacts	2 NC	—	⊕ B	3SE5 214-0KC05-1AE1	1 1 unit
	Snap-action contacts	2 NC	—	⊕ B	3SE5 214-0LC05-1AE1	1 1 unit
	With 2 LEDs, yellow/green					
 With 2 LEDs	Slow-action contacts	1 NO + 2 NC	24 V DC	⊕ B	3SE5 212-1KC05	1 1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	⊕ A	3SE5 212-1LC05	1 1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	⊕ B	3SE5 212-3KC05	1 1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	⊕ B	3SE5 212-3LC05	1 1 unit
	With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs					
	Slow-action contacts	1 NO + 1 NC	24 V DC	⊕ B	3SE5 214-1BC05-1AF3	1 1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	⊕ B	3SE5 214-1CC05-1AF3	1 1 unit
Plain plungers						
 Plain plunger	With high-grade steel plunger					
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 212-0BB01	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 212-0CB01	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0KB01	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0LB01	1 1 unit
Roller plungers, type C acc. to EN 50047						
 Roller plunger	With plastic roller 10 mm					
	Slow-action contacts	1 NO + 1 NC	—	⊕ A	3SE5 212-0BD03	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 212-0CD03	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ A	3SE5 212-0KD03	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0LD03	1 1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators.

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ Popular versions.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 31 mm acc. to EN 50047

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

Complete units¹⁾ · Enclosure width 31 mm



Roller lever

Roller levers, type E acc. to EN 50047

With metal lever and plastic roller 13 mm

Slow-action contacts	1 NO + 1 NC	—	⊕ A	3SE5 212-0BE10	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 212-0CE10	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0KE10	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0LE10	1	1 unit



Angular roller lever

Angular roller levers

With metal lever and plastic roller 13 mm

Slow-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 212-0BF10	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 212-0CF10	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0KF10	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0LF10	1	1 unit

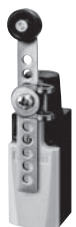


Twist lever

Twist levers, type A acc. to EN 50047

With metal lever 21 mm and plastic roller 19 mm

Slow-action contacts	1 NO + 1 NC	—	⊕ A	3SE5 212-0BK21	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊕ A	3SE5 212-0CK21	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0KK21	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0LK21	1	1 unit



Twist lever, adjustable length

Twist levers, adjustable length

With metal lever with grid hole and plastic roller 19 mm

Snap-action contacts	1 NO + 1 NC	—	⊕ A	3SE5 212-0CK60	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0KK60	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0LK60	1	1 unit

With metal lever and plastic roller 19 mm

Slow-action contacts	1 NO + 1 NC	—	A	3SE5 212-0BK50	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	B	3SE5 212-0CK50	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	B	3SE5 212-0LK50	1	1 unit

For online configurator see www.siemens.com/sirius/configurators.

Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ Popular versions.

Note:

If the device you require is not available as a complete unit, see "Modular System", see page 13/29.






Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 31 mm acc. to EN 50047

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	
Basic switches · Enclosure width 31 mm (with rounded plunger¹⁾)						
	With plunger					
	Slow-action contacts	1 NO + 1 NC	—	⊕ A	3SE5 212-0BC05	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ A	3SE5 212-0CC05	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ A	3SE5 212-0KC05	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ A	3SE5 212-0LC05	1 1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ A	3SE5 212-0MC05	1 1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊕ A	3SE5 212-0PC05	1 1 unit
	With increased corrosion protection²⁾					
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 212-0BC05-1CA0	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 212-0CC05-1CA0	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0KC05-1CA0	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0LC05-1CA0	1 1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	⊕ B	3SE5 212-0MC05-1CA0	1 1 unit
	Slow-action contacts	2 NO + 1 NC	—	⊕ B	3SE5 212-0PC05-1CA0	1 1 unit
	With M12 connector socket, 5-pole (125 V, 4 A)					
	Slow-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 214-0BC05-1AC5	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 214-0CC05-1AC5	1 1 unit
	Slow-action contacts	2 NC	—	⊕ B	3SE5 214-0KC05-1AE1	1 1 unit
	Snap-action contacts	2 NC	—	⊕ B	3SE5 214-0LC05-1AE1	1 1 unit
	With 2 LEDs, yellow/green					
	Slow-action contacts	1 NO + 2 NC	24 V DC	⊕ B	3SE5 212-1KC05	1 1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	⊕ A	3SE5 212-1LC05	1 1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	⊕ B	3SE5 212-3KC05	1 1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	⊕ B	3SE5 212-3LC05	1 1 unit
	With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs					
	Slow-action contacts	1 NO + 1 NC	24 V DC	⊕ B	3SE5 214-1BC05-1AF3	1 1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	⊕ B	3SE5 214-1CC05-1AF3	1 1 unit

For online configurator see www.siemens.com/sirius/configurators.



⊕ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

¹⁾ For enclosures with widths of 31mm, the basic switch is a complete unit with rounded plungers.

²⁾ Use corresponding high-grade steel lever.

Note:

Selection aid see page 13/9.











Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU	
Operating mechanisms					
	Plain plungers				
	High-grade steel plungers	10	⊕ A	3SE5 000-0AB01	1 1 unit
	Roller plungers, type C acc. to EN 50047				
	Plastic rollers	10	⊕ A	3SE5 000-0AD03	1 1 unit
	High-grade steel rollers	10	⊕ B	3SE5 000-0AD04	1 1 unit

⊕ Positively driven actuator, necessary in safety circuits.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 31 mm acc. to EN 50047

Version	Diameter	DT	Modular system	Price per PU	PU (UNIT, SET, M)	PS*
	mm		Order No.			
Operating mechanisms						
	Roller plungers with central fixing					
	Plastic rollers	10	⊕ B	3SE5 000-0AD10	1	1 unit
	High-grade steel rollers	10	⊕ B	3SE5 000-0AD11	1	1 unit
With central fixing						
	Roller levers, type E acc. to EN 50047					
	Metal lever, plastic roller	13	⊕ A	3SE5 000-0AE10	1	1 unit
	Metal lever, high-grade steel roller	13	⊕ B	3SE5 000-0AE11	1	1 unit
	High-grade steel lever, plastic roller	13	⊕ B	3SE5 000-0AE12	1	1 unit
	High-grade steel lever, high-grade steel roller	13	⊕ B	3SE5 000-0AE13	1	1 unit
	Angular roller levers					
	Metal lever, plastic roller	13	⊕ A	3SE5 000-0AF10	1	1 unit
	Metal lever, high-grade steel roller	13	⊕ B	3SE5 000-0AF11	1	1 unit
	High-grade steel lever, plastic roller	13	⊕ A	3SE5 000-0AF12	1	1 unit
	High-grade steel lever, high-grade steel roller	13	⊕ B	3SE5 000-0AF13	1	1 unit
	Spring rods (for switches with snap-action contacts only)					
	Plastic plunger and high-grade steel spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR01	1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	3SE5 000-0AR03	1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	3SE5 000-0AR04	1	1 unit
	High-grade steel plunger and spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR02	1	1 unit
Twist actuators						
	Twist actuators, plastic (without lever)					
	Switching right and/or left, adjustable		⊕ A	3SE5 000-0AK00	1	1 unit
Levers for twist actuators						
	Twist levers, straight, type A acc. to EN 50047					
	Metal lever 21 mm, plastic roller	19	⊕ A	3SE5 000-0AA21	1	1 unit
	Metal lever 21 mm, high-grade steel roller	19	⊕ B	3SE5 000-0AA22	1	1 unit
	Metal lever 21 mm, roller with ball bearing	19	⊕ B	3SE5 000-0AA23	1	1 unit
	Metal lever 21 mm, plastic roller	30	⊕ B	3SE5 000-0AA25	1	1 unit
	High-grade steel lever 21 mm, plastic roller	19	⊕ B	3SE5 000-0AA31	1	1 unit
	Twist levers 30 mm, straight¹⁾					
	Metal lever, plastic roller	19	⊕ B	3SE5 000-0AA24	1	1 unit
	Metal lever, plastic roller	30	⊕ B	3SE5 000-0AA26	1	1 unit
	Twist levers, adjustable length, with grid hole					
	Metal lever, plastic roller	19	⊕ B	3SE5 000-0AA60	1	1 unit
	Metal lever, high-grade steel roller	19	⊕ B	3SE5 000-0AA61	1	1 unit
	Metal lever, plastic roller	50	⊕ B	3SE5 000-0AA67	1	1 unit
	Metal lever, rubber roller	50	⊕ B	3SE5 000-0AA68	1	1 unit
	High-grade steel lever, plastic roller	19	⊕ B	3SE5 000-0AA62	1	1 unit
	High-grade steel lever, high-grade steel roller	19	⊕ B	3SE5 000-0AA63	1	1 unit
	Twist levers, adjustable length					
	Twist levers, adjustable length					
	Metal lever, plastic roller	19	A	3SE5 000-0AA50	1	1 unit
	Metal lever, high-grade steel roller	19	B	3SE5 000-0AA51	1	1 unit
	Metal lever, plastic roller	30	B	3SE5 000-0AA55	1	1 unit
	Metal lever, plastic roller	50	B	3SE5 000-0AA57	1	1 unit
	Metal lever, rubber roller	50	B	3SE5 000-0AA58	1	1 unit
	High-grade steel lever, plastic roller	19	B	3SE5 000-0AA52	1	1 unit
	High-grade steel lever, high-grade steel roller	19	B	3SE5 000-0AA53	1	1 unit
	Rod actuators, type D acc. to EN 50041					
	Aluminum rod, length 200 mm	6	B	3SE5 000-0AA80	1	1 unit
	Spring rod, length 200 mm	6	B	3SE5 000-0AA81	1	1 unit
	Plastic rod, length 200 mm	6	B	3SE5 000-0AA82	1	1 unit
	Plastic rod, length 330 mm	6	B	3SE5 000-0AA83	1	1 unit

⊕ Positively driven actuator, necessary in safety circuits.

¹⁾ Can be clinch mounted (turned through 180°, rear of lever).

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 40 mm acc. to EN 50041

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Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

Complete units¹⁾ · Enclosure width 40 mm



Plain plunger

Plain plungers

With high-grade steel plunger

Slow-action contacts	1 NO + 1 NC —	⊕ A	3SE5 112-0BB01	1	1 unit
Snap-action contacts	1 NO + 1 NC —	⊕ A	3SE5 112-0CB01	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊕ ►	3SE5 112-0KB01	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊕ B	3SE5 112-0LB01	1	1 unit



Rounded plunger

Rounded plungers, type B acc. to EN 50041

With high-grade steel plungers, with 3 mm overtravel

Slow-action contacts	1 NO + 1 NC —	⊕ ►	3SE5 112-0BC02	1	1 unit
Snap-action contacts	1 NO + 1 NC —	⊕ ►	3SE5 112-0CC02	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊕ B	3SE5 112-0KC02	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊕ B	3SE5 112-0LC02	1	1 unit



Roller plunger

Roller plungers, type C acc. to EN 50041

With high-grade steel roller 13 mm, with 3 mm overtravel

Slow-action contacts	1 NO + 1 NC —	⊕ ►	3SE5 112-0BD02	1	1 unit
Snap-action contacts	1 NO + 1 NC —	⊕ ►	3SE5 112-0CD02	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊕ ►	3SE5 112-0KD02	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊕ ►	3SE5 112-0LD02	1	1 unit

With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs

Snap-action contacts	1 NO + 1 NC 24 V DC	⊕ B	3SE5 114-1CD02-1AF3	1	1 unit
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Roller lever

Roller levers

With metal lever and plastic roller 22 mm

Slow-action contacts	1 NO + 1 NC —	⊕ ►	3SE5 112-0BE01	1	1 unit
Snap-action contacts	1 NO + 1 NC —	⊕ ►	3SE5 112-0CE01	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊕ B	3SE5 112-0KE01	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊕ B	3SE5 112-0LE01	1	1 unit



Angular roller lever

Angular roller levers

With metal lever and plastic roller 22 mm

Slow-action contacts	1 NO + 1 NC —	⊕ B	3SE5 112-0BF01	1	1 unit
Snap-action contacts	1 NO + 1 NC —	⊕ ►	3SE5 112-0CF01	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊕ B	3SE5 112-0LF01	1	1 unit



Spring rod

Spring rods

Length 142.5 mm, with plastic plunger 50 mm

Snap-action contacts	1 NO + 1 NC —	►	3SE5 112-0CR01	1	1 unit
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For online configurator see www.siemens.com/sirius/configurators.

Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ Popular versions.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 40 mm acc. to EN 50041

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units		PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

Complete units¹⁾ · Enclosure width 40 mm

Twist levers, type A acc. to EN 50041

With metal lever 27 mm and plastic roller 19 mm

Slow-action contacts	1 NO + 1 NC	—	⊙ ▶	3SE5 112-0BH01	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊙ ▶	3SE5 112-0CH01	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊙ ▶	3SE5 112-0KH01	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊙ B	3SE5 112-0LH01	1	1 unit

With M12 connector socket, 5-pole (125 V, 4 A)

Snap-action contacts	1 NO + 1 NC	—	⊙ A	3SE5 114-0CH01-1AC5	1	1 unit
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With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs

Snap-action contacts	1 NO + 1 NC	24 V DC	⊙ B	3SE5 114-1CH01-1AF3	1	1 unit
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With metal lever 27 mm and high-grade steel roller 19 mm

Slow-action contacts	1 NO + 1 NC	—	⊙ B	3SE5 112-0BH02	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊙ ▶	3SE5 112-0CH02	1	1 unit

With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs

Snap-action contacts	1 NO + 1 NC	—	⊙ B	3SE5 114-1CH02-1AF3	1	1 unit
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With metal lever 30 mm and plastic roller 19 mm

Snap-action contacts	1 NO + 1 NC	—	⊙ A	3SE5 112-0CH24	1	1 unit
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Twist levers, adjustable length

With metal lever with grid hole and plastic roller 19 mm

Slow-action contacts	1 NO + 1 NC	—	⊙ ▶	3SE5 112-0BH60	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	⊙ ▶	3SE5 112-0CH60	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊙ B	3SE5 112-0LH60	1	1 unit

With metal lever and plastic roller 19 mm

Slow-action contacts	1 NO + 1 NC	—	B	3SE5 112-0BH50	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	▶	3SE5 112-0CH50	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	B	3SE5 112-0LH50	1	1 unit

With M12 connector socket, 8-pole (30 V, 2 A) and 2 LEDs

Snap-action contacts	1 NO + 2 NC	24 V DC	B	3SE5 114-1LH50-1AD4	1	1 unit
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With metal lever and high-grade steel roller 19 mm

Snap-action contacts	1 NO + 1 NC	—	B	3SE5 112-0CH51	1	1 unit
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Fork levers, latching

With metal lever and 2 plastic rollers 19 mm

Snap-action contacts	1 NO + 1 NC	—	⊙ B	3SE5 112-0CT11	1	1 unit
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Rod actuators, type D, acc. to EN 50041

With aluminum rod, length 200 mm

Snap-action contacts	1 NO + 1 NC	—	▶	3SE5 112-0CH80	1	1 unit
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With plastic rod, length 200 mm

Snap-action contacts	1 NO + 1 NC	—	B	3SE5 112-0CH82	1	1 unit
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Twist lever



Twist lever, adjustable length, with grid hole



Twist lever, adjustable length



Fork lever



Rod actuator

⚙ For online configurator see www.siemens.com/sirius/configurators.

⊙ Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ Popular versions.

Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/33.








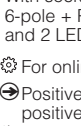

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 40 mm acc. to EN 50041

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	
Basic switches · Enclosure width 40 mm						
	With M20 × 1.5 connecting thread					
	Slow-action contacts	1 NO + 1 NC	—	➡	3SE5 112-0BA00	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	➡	3SE5 112-0CA00	1 1 unit
	• Gold-plated contacts			B	3SE5 112-0CA00-1AC1	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	A	3SE5 112-0KA00	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	➡	3SE5 112-0LA00	1 1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	➡	3SE5 112-0MA00	1 1 unit
	Slow-action contacts	2 NO + 1 NC	—	➡	3SE5 112-0PA00	1 1 unit
	With increased corrosion protection¹⁾					
	Slow-action contacts	1 NO + 1 NC	—	➡ B	3SE5 112-0BA00-1CA0	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	➡ B	3SE5 112-0CA00-1CA0	1 1 unit
	Slow-action contacts	1 NO + 2 NC	—	➡ B	3SE5 112-0KA00-1CA0	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	➡ B	3SE5 112-0LA00-1CA0	1 1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	—	➡ B	3SE5 112-0MA00-1CA0	1 1 unit
	Slow-action contacts	2 NO + 1 NC	—	➡ B	3SE5 112-0PA00-1CA0	1 1 unit
	With M12 connector socket, 5-pole (125 V, 4 A)					
	Slow-action contacts	1 NO + 1 NC	—	➡ B	3SE5 114-0BA00-1AC5	1 1 unit
	Snap-action contacts	1 NO + 1 NC	—	➡	3SE5 114-0CA00-1AC5	1 1 unit
	Slow-action contacts	2 NC	—	➡ B	3SE5 114-0KA00-1AE1	1 1 unit
	Snap-action contacts	2 NC	—	➡ B	3SE5 114-0LA00-1AE1	1 1 unit
	With connector socket, 6-pole + PE (250 V, 10 A)					
	Slow-action contacts	1 NO + 2 NC	—	➡ B	3SE5 115-0KA00-1AD1	1 1 unit
	Snap-action contacts	1 NO + 2 NC	—	➡	3SE5 115-0LA00-1AD1	1 1 unit
	With connector socket, 6-pole + PE (250 V, 10 A) and quick-release device					
	Snap-action contacts	1 NO + 1 NC	—	➡ B	3SE5 115-0CA00-1AD0	1 1 unit
	With 2 LEDs, yellow/green					
	Slow-action contacts	1 NO + 2 NC	24 V DC	➡ B	3SE5 112-1KA00	1 1 unit
	Snap-action contacts	1 NO + 2 NC	24 V DC	➡	3SE5 112-1LA00	1 1 unit
	Slow-action contacts	1 NO + 2 NC	230 V AC	➡ B	3SE5 112-3KA00	1 1 unit
	Snap-action contacts	1 NO + 2 NC	230 V AC	➡ B	3SE5 112-3LA00	1 1 unit
	With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs					
	Slow-action contacts	1 NO + 1 NC	24 V DC	➡ B	3SE5 114-1BA00-1AF3	1 1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	➡ B	3SE5 114-1CA00-1AF3	1 1 unit
	With M12 connector socket, 8-pole (30 V, 2 A) and 2 LEDs					
	Snap-action contacts	1 NO + 2 NC	24 V DC	➡ B	3SE5 114-1LA00-1AD4	1 1 unit
	With connector socket, 6-pole + PE (10 A), and 2 LEDs					
	Slow-action contacts	1 NO + 1 NC	24 V DC	➡ B	3SE5 115-1BA00-1AF2	1 1 unit
	Snap-action contacts	1 NO + 1 NC	24 V DC	➡ B	3SE5 115-1CA00-1AF2	1 1 unit
	Snap-action contacts	2 NC	24 V DC	➡ B	3SE5 115-1LA00-1AD2	1 1 unit

For online configurator see www.siemens.com/sirius/configurators.

➡ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

¹⁾ Use corresponding high-grade steel lever.






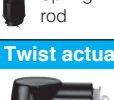
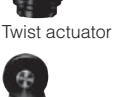
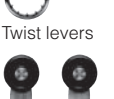


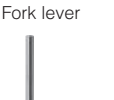

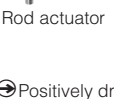
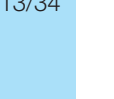
Note:

Selection aid, see page 13/9.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 40 mm acc. to EN 50041

Version	Diameter	DT	Modular system		PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU		
Operating mechanisms						
	Plain plungers					
	High-grade steel plungers	10	⊙ A	3SE5 000-0AB01	1	1 unit
	Rounded plungers, type B acc. to EN 50041					
	High-grade steel plungers, with 3 mm overtravel	10	⊙ ▶	3SE5 000-0AC02	1	1 unit
	Roller plungers, type C acc. to EN 50041					
	High-grade steel roller, with 3 mm overtravel	13	⊙ ▶	3SE5 000-0AD02	1	1 unit
	Roller levers					
	Metal lever, plastic roller	22	⊙ ▶	3SE5 000-0AE01	1	1 unit
	Metal lever, high-grade steel roller	22	⊙ ▶	3SE5 000-0AE02	1	1 unit
	High-grade steel lever, plastic roller	22	⊙ B	3SE5 000-0AE03	1	1 unit
	High-grade steel lever, high-grade steel roller	22	⊙ B	3SE5 000-0AE04	1	1 unit
	Angular roller levers					
	Metal lever, plastic roller	22	⊙ ▶	3SE5 000-0AF01	1	1 unit
	Metal lever, high-grade steel roller	22	⊙ B	3SE5 000-0AF02	1	1 unit
	High-grade steel lever, plastic roller	22	⊙ B	3SE5 000-0AF03	1	1 unit
	High-grade steel lever, high-grade steel roller	22	⊙ B	3SE5 000-0AF04	1	1 unit
Spring rods (for switches with snap-action contacts only)						
	Plastic plunger and high-grade steel spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR01	1	1 unit
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	3SE5 000-0AR03	1	1 unit
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	3SE5 000-0AR04	1	1 unit
	High-grade steel plunger and spring:	7				
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR02	1	1 unit
Twist actuators						
	Twist actuators, metal (without lever)					
	• For twist levers and rod actuators, switching right and/or left, adjustable	⊙ A	3SE5 000-0AH00	1	1 unit	
	• For fork levers, latching	⊙ ▶	3SE5 000-0AT10	1	1 unit	
	Levers for twist actuators					
	Twist levers, offset, type A acc. to EN 50041					
	Metal lever 27 mm, plastic roller	19	⊙ A	3SE5 000-0AA01	1	1 unit
	Metal lever 27 mm, high-grade steel roller	19	⊙ A	3SE5 000-0AA02	1	1 unit
	Metal lever 27 mm, roller with ball bearing	19	⊙ B	3SE5 000-0AA03	1	1 unit
	Metal lever 27 mm, 2 plastic rollers	19	⊙ B	3SE5 000-0AA04	1	1 unit
	Metal lever 27 mm, plastic roller	30	⊙ B	3SE5 000-0AA05	1	1 unit
	Metal lever 27 mm, rubber roller	50	⊙ B	3SE5 000-0AA08	1	1 unit
	High-grade steel lever 27 mm, plastic roller	19	⊙ B	3SE5 000-0AA11	1	1 unit
	High-grade steel lever 27 mm, high-grade steel roller	19	⊙ B	3SE5 000-0AA12	1	1 unit
	Metal lever 35 mm, plastic roller	19	⊙ B	3SE5 000-0AA15	1	1 unit
	Twist levers 30 mm, straight ¹⁾					
	Metal lever, plastic roller	19	⊙ B	3SE5 000-0AA24	1	1 unit
	Twist levers, adjustable length, with grid hole					
	Metal lever, plastic roller	19	⊙ B	3SE5 000-0AA60	1	1 unit
	Metal lever, high-grade steel roller	19	⊙ B	3SE5 000-0AA61	1	1 unit
	Metal lever, rubber roller	50	⊙ B	3SE5 000-0AA68	1	1 unit
	High-grade steel lever, plastic roller	19	⊙ B	3SE5 000-0AA62	1	1 unit
	High-grade steel lever, high-grade steel roller	19	⊙ B	3SE5 000-0AA63	1	1 unit
	Twist levers, adjustable length					
	Metal lever, plastic roller	19	A	3SE5 000-0AA50	1	1 unit
	Metal lever, high-grade steel roller	19	B	3SE5 000-0AA51	1	1 unit
	Metal lever, plastic roller	30	B	3SE5 000-0AA55	1	1 unit
	Metal lever, rubber roller	50	B	3SE5 000-0AA58	1	1 unit
	High-grade steel lever, plastic roller	19	B	3SE5 000-0AA52	1	1 unit
	High-grade steel lever, high-grade steel roller	19	B	3SE5 000-0AA53	1	1 unit
	Fork levers (for switches with snap-action contacts only)					
	2 metal levers, 2 plastic rollers	19	⊙ ▶	3SE5 000-0AT01	1	1 unit
	2 metal levers, 2 high-grade steel rollers	19	⊙ B	3SE5 000-0AT02	1	1 unit
	2 high-grade steel levers, 2 plastic rollers	19	⊙ B	3SE5 000-0AT03	1	1 unit
	Rod actuators, type D acc. to EN 50041					
	Aluminum rod, length 200 mm	6	B	3SE5 000-0AA80	1	1 unit
	Spring rod, length 200 mm	6	B	3SE5 000-0AA81	1	1 unit
	Plastic rod, length 200 mm	6	B	3SE5 000-0AA82	1	1 unit

⊙ Positively driven actuator, necessary in safety circuits.

¹⁾ Can be clinch mounted (turned through 180°, rear of lever).

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 56 mm

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2
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Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	

Complete units¹⁾ · Enclosure width 56 mm



Plain plunger

Plain plungers

With high-grade steel plunger

Slow-action contacts	1 NO + 1 NC —	⊙ B	3SE5 122-0BB01	1	1 unit
Snap-action contacts	1 NO + 1 NC —	⊙ B	3SE5 122-0CB01	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊙ B	3SE5 122-0KB01	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊙ B	3SE5 122-0LB01	1	1 unit
Slow-action contacts	2 NO + 1 NC —	⊙ B	3SE5 122-0PB01	1	1 unit



Rounded plunger

Rounded plungers

With high-grade steel plungers, with 3 mm overtravel

Slow-action contacts	1 NO + 1 NC —	⊙ B	3SE5 122-0BC02	1	1 unit
Snap-action contacts	1 NO + 1 NC —	⊙ ►	3SE5 122-0CC02	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊙ B	3SE5 122-0KC02	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊙ B	3SE5 122-0LC02	1	1 unit
Slow-action contacts	2 NO + 1 NC —	⊙ B	3SE5 122-0PC02	1	1 unit



Roller plunger

Roller plungers

With high-grade steel roller 13 mm, with 3 mm overtravel

Slow-action contacts	1 NO + 1 NC —	⊙ ►	3SE5 122-0BD02	1	1 unit
Snap-action contacts	1 NO + 1 NC —	⊙ ►	3SE5 122-0CD02	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊙ ►	3SE5 122-0KD02	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊙ B	3SE5 122-0LD02	1	1 unit



Roller lever

Roller levers

With metal lever and plastic roller 22 mm

Slow-action contacts	1 NO + 1 NC —	⊙ ►	3SE5 122-0BE01	1	1 unit
Snap-action contacts	1 NO + 1 NC —	⊙ ►	3SE5 122-0CE01	1	1 unit
Slow-action contacts	1 NO + 2 NC —	⊙ ►	3SE5 122-0KE01	1	1 unit
Snap-action contacts	1 NO + 2 NC —	⊙ B	3SE5 122-0LE01	1	1 unit
Slow-action contacts	2 NO + 1 NC —	⊙ B	3SE5 122-0PE01	1	1 unit

With metal lever and high-grade steel roller 22 mm

Snap-action contacts	1 NO + 1 NC —	⊙ B	3SE5 122-0CE02	1	1 unit
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Angular roller lever

Angular roller levers

With metal lever and plastic roller 22 mm

Slow-action contacts	1 NO + 1 NC —	⊙ B	3SE5 122-0BF01	1	1 unit
Snap-action contacts	1 NO + 1 NC —	⊙ ►	3SE5 122-0CF01	1	1 unit
Slow-action contacts	2 NO + 1 NC —	⊙ B	3SE5 122-0PF01	1	1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators.

⊙ Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ Popular versions.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 56 mm

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Complete units		PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

Complete units¹⁾ · Enclosure width 56 mm



Spring rod

Spring rods

Length 142.5 mm, with plastic plunger 50 mm

Snap-action contacts

1 NO + 1 NC —



3SE5 122-0CR01

1

1 unit



Twist lever

Twist levers

With metal lever 27 mm and plastic roller 19 mm

Slow-action contacts

1 NO + 1 NC —



3SE5 122-0BH01

1

1 unit

Snap-action contacts

1 NO + 1 NC —



3SE5 122-0CH01

1

1 unit

Slow-action contacts

1 NO + 2 NC —



3SE5 122-0KH01

1

1 unit

Snap-action contacts

1 NO + 2 NC —



3SE5 122-0LH01

1

1 unit

Slow-action contacts

2 NO + 1 NC —



3SE5 122-0PH01

1

1 unit

With metal lever 27 mm and high-grade steel roller 19 mm

Snap-action contacts

1 NO + 1 NC —



3SE5 122-0CH02

1

1 unit

Snap-action contacts

1 NO + 2 NC —



3SE5 122-0LH02

1

1 unit

Twist levers, adjustable length

With metal lever with grid hole and plastic roller 19 mm

Slow-action contacts

1 NO + 1 NC —



3SE5 122-0BH60

1

1 unit

Snap-action contacts

1 NO + 1 NC —



3SE5 122-0CH60

1

1 unit

Snap-action contacts

1 NO + 2 NC —



3SE5 122-0LH60

1

1 unit

With metal lever and plastic roller 19 mm

Slow-action contacts

1 NO + 1 NC —



3SE5 122-0BH50

1

1 unit

Snap-action contacts

1 NO + 1 NC —



3SE5 122-0CH50

1

1 unit

Snap-action contacts

1 NO + 2 NC —



3SE5 122-0LH50

1

1 unit



Twist lever, adjustable length

Fork levers, latching

With metal lever and 2 plastic rollers 19 mm

Snap-action contacts

1 NO + 1 NC —



3SE5 122-0CT11

1

1 unit



Fork lever

Rod actuators

With aluminum rod, length 200 mm

Snap-action contacts

1 NO + 1 NC —



3SE5 122-0CH80

1

1 unit

With plastic rod, length 200 mm

Snap-action contacts

1 NO + 1 NC —



3SE5 122-0CH82

1

1 unit



Rod actuator

For online configurator see www.siemens.com/sirius/configurators.

Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ Popular versions.

Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/37.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 56 mm

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	

Basic switches · Enclosure width 56 mm



Basic switch



With increased corrosion protection



With 2 LEDs

With 3 x M20 x 1.5 connecting thread

Slow-action contacts	1 NO + 1 NC	—	➡	3SE5 122-0BA00	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	➡	3SE5 122-0CA00	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	➡ B	3SE5 122-0KA00	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	➡ A	3SE5 122-0LA00	1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	➡ A	3SE5 122-0MA00	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	➡	3SE5 122-0PA00	1	1 unit

With increased corrosion protection¹⁾

Slow-action contacts	1 NO + 1 NC	—	➡ B	3SE5 122-0BA00-1CA0	1	1 unit
Snap-action contacts	1 NO + 1 NC	—	➡ B	3SE5 122-0CA00-1CA0	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	➡ B	3SE5 122-0KA00-1CA0	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	➡ B	3SE5 122-0LA00-1CA0	1	1 unit
Slow-action contacts with make-before-break	1 NO + 2 NC	—	➡ B	3SE5 122-0MA00-1CA0	1	1 unit
Slow-action contacts	2 NO + 1 NC	—	➡ B	3SE5 122-0PA00-1CA0	1	1 unit

With 2 LEDs, yellow/green

Slow-action contacts	1 NO + 2 NC	24 V DC	➡ B	3SE5 122-1KA00	1	1 unit
Snap-action contacts	1 NO + 2 NC	24 V DC	➡ B	3SE5 122-1LA00	1	1 unit
Slow-action contacts	1 NO + 2 NC	230 V AC	➡ B	3SE5 122-3KA00	1	1 unit
Snap-action contacts	1 NO + 2 NC	230 V AC	➡ B	3SE5 122-3LA00	1	1 unit

For online configurator see www.siemens.com/sirius/configurators.

➡ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

¹⁾ Use corresponding high-grade steel lever.

Note:

Selection aid see page 13/9.

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU	

Operating mechanisms



Rounded plunger, roller plunger



Roller lever



Angular roller lever









Spring rod

Plain plungers					
High-grade steel plungers	10	➡ A	3SE5 000-0AB01	1	1 unit
Rounded plungers, type B acc. to EN 50041					
High-grade steel plungers, with 3 mm overtravel	10	➡ B	3SE5 000-0AC02	1	1 unit
Roller plungers, type C acc. to EN 50041					
High-grade steel roller, with 3 mm overtravel	13	➡ B	3SE5 000-0AD02	1	1 unit
Roller levers					
Metal lever, plastic roller	22	➡ A	3SE5 000-0AE01	1	1 unit
Metal lever, high-grade steel roller	22	➡ B	3SE5 000-0AE02	1	1 unit
High-grade steel lever, plastic roller	22	➡ B	3SE5 000-0AE03	1	1 unit
High-grade steel lever, high-grade steel roller	22	➡ B	3SE5 000-0AE04	1	1 unit
Angular roller levers					
Metal lever, plastic roller	22	➡ A	3SE5 000-0AF01	1	1 unit
Metal lever, high-grade steel roller	22	➡ B	3SE5 000-0AF02	1	1 unit
High-grade steel lever, plastic roller	22	➡ B	3SE5 000-0AF03	1	1 unit
High-grade steel lever, high-grade steel roller	22	➡ B	3SE5 000-0AF04	1	1 unit
Spring rods (for switches with snap-action contacts only)					
Plastic plunger and high-grade steel spring:	7				
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR01	1	1 unit
• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	3SE5 000-0AR03	1	1 unit
• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	3SE5 000-0AR04	1	1 unit
High-grade steel plunger and spring:	7				
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR02	1	1 unit

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure width 56 mm

Version	Diameter	DT	Modular system		PU (UNIT, SET, M)	PS*	
mm			Order No.	Price per PU			
Twist actuators							
	Twist actuators, metal (without lever)						
	• For twist levers and rod actuators, switching right and/or left, adjustable	⤴ A	3SE5 000-0AH00		1	1 unit	
	• For fork levers, latching	⤴ B	3SE5 000-0AT10		1	1 unit	
Levers for twist actuators							
	Twist levers 27 mm, offset, type A acc. to EN 50041						
	Metal lever, plastic roller	19	⤴ A	3SE5 000-0AA01		1	1 unit
	Metal lever, high-grade steel roller	19	⤴ A	3SE5 000-0AA02		1	1 unit
	Metal lever, roller with ball bearing	19	⤴ B	3SE5 000-0AA03		1	1 unit
	Metal lever, 2 plastic rollers	19	⤴ B	3SE5 000-0AA04		1	1 unit
	Metal lever, plastic roller	30	⤴ B	3SE5 000-0AA05		1	1 unit
	Metal lever, plastic roller	50	⤴ B	3SE5 000-0AA07		1	1 unit
	Metal lever, rubber roller	50	⤴ B	3SE5 000-0AA08		1	1 unit
	High-grade steel lever, plastic roller	19	⤴ B	3SE5 000-0AA11		1	1 unit
	High-grade steel lever, high-grade steel roller	19	⤴ B	3SE5 000-0AA12		1	1 unit
	Twist levers 35 mm, offset						
	Metal lever, plastic roller	19	⤴ B	3SE5 000-0AA15		1	1 unit
	Twist levers 30 mm, straight ¹⁾						
	Metal lever, plastic roller	19	⤴ B	3SE5 000-0AA24		1	1 unit
	Metal lever, plastic roller	30	⤴ B	3SE5 000-0AA26		1	1 unit
	Twist levers, adjustable length, with grid hole						
	Metal lever, plastic roller	19	⤴ B	3SE5 000-0AA60		1	1 unit
	Metal lever, high-grade steel roller	19	⤴ B	3SE5 000-0AA61		1	1 unit
	Metal lever, plastic roller	50	⤴ B	3SE5 000-0AA67		1	1 unit
	Metal lever, rubber roller	50	⤴ B	3SE5 000-0AA68		1	1 unit
	High-grade steel lever, plastic roller	19	⤴ B	3SE5 000-0AA62		1	1 unit
	High-grade steel lever, high-grade steel roller	19	⤴ B	3SE5 000-0AA63		1	1 unit
	Twist levers, adjustable length						
	Metal lever, plastic roller	19	A	3SE5 000-0AA50		1	1 unit
	Metal lever, high-grade steel roller	19	B	3SE5 000-0AA51		1	1 unit
	Metal lever, plastic roller	30	B	3SE5 000-0AA55		1	1 unit
	Metal lever, plastic roller	50	B	3SE5 000-0AA57		1	1 unit
	Metal lever, rubber roller	50	B	3SE5 000-0AA58		1	1 unit
	High-grade steel lever, plastic roller	19	B	3SE5 000-0AA52		1	1 unit
	High-grade steel lever, high-grade steel roller	19	B	3SE5 000-0AA53		1	1 unit
	Fork levers (for switches with snap-action contacts only)						
	2 metal levers, 2 plastic rollers	19	⤴ B	3SE5 000-0AT01		1	1 unit
	2 metal levers, 2 high-grade steel rollers	19	⤴ B	3SE5 000-0AT02		1	1 unit
	2 high-grade steel levers, 2 plastic rollers	19	⤴ B	3SE5 000-0AT03		1	1 unit
	2 high-grade steel levers, 2 high-grade steel rollers	19	⤴ B	3SE5 000-0AT04		1	1 unit
Rod actuators, type D acc. to EN 50041							
	Aluminum rod, length 200 mm	6	B	3SE5 000-0AA80		1	1 unit
	Spring rod, length 200 mm	6	B	3SE5 000-0AA81		1	1 unit
	Plastic rod, length 200 mm	6	B	3SE5 000-0AA82		1	1 unit

⊙ Positively driven actuator, necessary in safety circuits.

¹⁾ Can be clinch mounted (turned through 180°, rear of lever).

Limit Switches

SIRIUS 3SE5 International Limit Switches

Metal enclosures
Enclosure width 56 mm, XL

1
2
3
4
5
6
7
8
9
10
11
12
13

Selection and ordering data

Complete units

4 or 5 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	

Complete units¹⁾ · Enclosure width 56 mm, XL



Plain plunger

Plain plungers

With high-grade steel plunger

Snap-action contacts 2 × (1 NO + 1 NC) — ⊕ B 3SE5 162-0CB01 1 1 unit



Rounded plunger

Rounded plungers

With high-grade steel plungers, with 3 mm overtravel

Slow-action contacts 1 NO + 1 NC and ⊕ B 3SE5 162-0EC02 1 1 unit
 Slow-action contacts with make-before-break 1 NO + 2 NC
 2 mm travel difference



Roller plunger

Roller plungers

With high-grade steel roller 13 mm, with 3 mm overtravel

Slow-action contacts 2 × (1 NO + 1 NC) — ⊕ B 3SE5 162-0BD02 1 1 unit
 Snap-action contacts 2 × (1 NO + 1 NC) — ⊕ A 3SE5 162-0CD02 1 1 unit



Roller lever

Roller levers

With metal lever and plastic roller 22 mm

Slow-action contacts 2 × (1 NO + 1 NC) — ⊕ B 3SE5 162-0BE01 1 1 unit
 Snap-action contacts 2 × (1 NO + 1 NC) — ⊕ A 3SE5 162-0CE01 1 1 unit

With metal lever and high-grade steel roller 22 mm

Snap-action contacts 2 × (1 NO + 1 NC) — ⊕ B 3SE5 162-0CE02 1 1 unit



Angular roller lever

Angular roller levers

With metal lever and plastic roller 22 mm

Snap-action contacts 2 × (1 NO + 1 NC) — ⊕ B 3SE5 162-0CF01 1 1 unit



Twist lever

Twist levers

With metal lever 27 mm and plastic roller 19 mm

Snap-action contacts 2 × (1 NO + 1 NC) — ⊕ A 3SE5 162-0CH01 1 1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators.

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ Popular versions.

Note:

If the device you require is not available as a complete unit, see "Modular System", page 13/40.

Limit Switches

SIRIUS 3SE5 International Limit Switches

Metal enclosures
Enclosure width 56 mm, XL

Modular system

4 or 6 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	

Basic switches · Enclosure width 56 mm, XL



Basic switch

With 3 x M20 x 1.5 connecting thread

Slow-action contacts	2 × (1 NO + 1 NC)	—	⊙ ▶	3SE5 162-0BA00	1	1 unit
Snap-action contacts	2 × (1 NO + 1 NC)	—	⊙ A	3SE5 162-0CA00	1	1 unit
Slow-action contacts with make-before-break	2 × (1 NO + 2 NC)	—	⊙ A	3SE5 162-0DA00	1	1 unit

With increased corrosion protection¹⁾

Slow-action contacts	2 × (1 NO + 1 NC)	—	⊙ B	3SE5 162-0BA00-1CA0	1	1 unit
Snap-action contacts	2 × (1 NO + 1 NC)	—	⊙ B	3SE5 162-0CA00-1CA0	1	1 unit
Slow-action contacts with make-before-break	2 × (1 NO + 2 NC)	—	⊙ B	3SE5 162-0DA00-1CA0	1	1 unit

For online configurator see www.siemens.com/sirius/configurators.

⊙ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

¹⁾ Use corresponding high-grade steel lever.

Note:

Selection aid see page 13/9.

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU	

Operating mechanisms



Plain plunger

Plain plungers

High-grade steel plungers	10	⊙ A	3SE5 000-0AB01	1	1 unit
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Rounded plunger

Rounded plungers, type B acc. to EN 50041

High-grade steel plungers, with 3 mm overtravel	10	⊙ B	3SE5 000-0AC02	1	1 unit
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Roller plunger

Roller plungers, type C acc. to EN 50041

High-grade steel roller, with 3 mm overtravel	13	⊙ B	3SE5 000-0AD02	1	1 unit
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Roller lever

Roller levers

Metal lever, plastic roller	22	⊙ A	3SE5 000-0AE01	1	1 unit
Metal lever, high-grade steel roller	22	⊙ B	3SE5 000-0AE02	1	1 unit
High-grade steel lever, plastic roller	22	⊙ B	3SE5 000-0AE03	1	1 unit
High-grade steel lever, high-grade steel roller	22	⊙ B	3SE5 000-0AE04	1	1 unit



Angular roller lever

Angular roller levers

Metal lever, plastic roller	22	⊙ A	3SE5 000-0AF01	1	1 unit
Metal lever, high-grade steel roller	22	⊙ B	3SE5 000-0AF02	1	1 unit
High-grade steel lever, plastic roller	22	⊙ B	3SE5 000-0AF03	1	1 unit
High-grade steel lever, high-grade steel roller	22	⊙ B	3SE5 000-0AF04	1	1 unit



Spring rod

Spring rods (for switches with snap-action contacts only)

Plastic plunger and high-grade steel spring:	7				
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR01	1	1 unit
• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	3SE5 000-0AR03	1	1 unit
• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	3SE5 000-0AR04	1	1 unit
High-grade steel plunger and spring:	7				
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	3SE5 000-0AR02	1	1 unit






⊙ Positively driven actuator, necessary in safety circuits.

Limit Switches

SIRIUS 3SE5 International Limit Switches

Metal enclosures
Enclosure width 56mm and 56mm, XL

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12
13

Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU	
Twist actuators					
	Twist actuators, metal (without lever)				
	• For twist levers and rod actuators, switching right and/or left, adjustable	➡ A	3SE5 000-0AH00	1	1 unit
	• For fork levers, latching	➡ B	3SE5 000-0AT10	1	1 unit
Levers for twist actuators					
	Twist levers 27 mm, offset, type A acc. to EN 50041				
	Metal lever, plastic roller	➡ A	3SE5 000-0AA01	1	1 unit
	Metal lever, high-grade steel roller	➡ A	3SE5 000-0AA02	1	1 unit
	Metal lever, roller with ball bearing	➡ B	3SE5 000-0AA03	1	1 unit
	Metal lever, 2 plastic rollers	➡ B	3SE5 000-0AA04	1	1 unit
	Metal lever, plastic roller	➡ B	3SE5 000-0AA05	1	1 unit
	Metal lever, plastic roller	➡ B	3SE5 000-0AA07	1	1 unit
	Metal lever, rubber roller	➡ B	3SE5 000-0AA08	1	1 unit
	High-grade steel lever, plastic roller	➡ B	3SE5 000-0AA11	1	1 unit
	High-grade steel lever, high-grade steel roller	➡ B	3SE5 000-0AA12	1	1 unit
	Twist levers 35 mm, offset				
	Metal lever, plastic roller	➡ B	3SE5 000-0AA15	1	1 unit
	Twist levers 30 mm, straight¹⁾				
	Metal lever, plastic roller	➡ B	3SE5 000-0AA24	1	1 unit
	Metal lever, plastic roller	➡ B	3SE5 000-0AA26	1	1 unit
	Twist levers, adjustable length, with grid hole				
	Metal lever, plastic roller	➡ B	3SE5 000-0AA60	1	1 unit
	Metal lever, high-grade steel roller	➡ B	3SE5 000-0AA61	1	1 unit
	Metal lever, plastic roller	➡ B	3SE5 000-0AA67	1	1 unit
	Metal lever, rubber roller	➡ B	3SE5 000-0AA68	1	1 unit
	High-grade steel lever, plastic roller	➡ B	3SE5 000-0AA62	1	1 unit
	High-grade steel lever, high-grade steel roller	➡ B	3SE5 000-0AA63	1	1 unit
	Twist levers, adjustable length				
	Metal lever, plastic roller	A	3SE5 000-0AA50	1	1 unit
	Metal lever, high-grade steel roller	B	3SE5 000-0AA51	1	1 unit
	Metal lever, plastic roller	30	3SE5 000-0AA55	1	1 unit
	Metal lever, plastic roller	50	3SE5 000-0AA57	1	1 unit
	Metal lever, rubber roller	50	3SE5 000-0AA58	1	1 unit
	High-grade steel lever, plastic roller	19	3SE5 000-0AA52	1	1 unit
	High-grade steel lever, high-grade steel roller	19	3SE5 000-0AA53	1	1 unit
	Fork levers (for switches with snap-action contacts only)				
	2 metal levers, 2 plastic rollers	➡ B	3SE5 000-0AT01	1	1 unit
	2 metal levers, 2 high-grade steel rollers	➡ B	3SE5 000-0AT02	1	1 unit
	2 high-grade steel levers, 2 plastic rollers	➡ B	3SE5 000-0AT03	1	1 unit
	2 high-grade steel levers, 2 high-grade steel rollers	➡ B	3SE5 000-0AT04	1	1 unit
	Rod actuators, type D acc. to EN 50041				
	Aluminum rod, length 200 mm	B	3SE5 000-0AA80	1	1 unit
	Spring rod, length 200 mm	B	3SE5 000-0AA81	1	1 unit
	Plastic rod, length 200 mm	B	3SE5 000-0AA82	1	1 unit
	Plastic rod, length 330 mm	B	3SE5 000-0AA83²⁾	1	1 unit

➡ Positively driven actuator, necessary in safety circuits.

¹⁾ Can be clinch mounted (turned through 180°, rear of lever).

²⁾ For Enclosure width 56mm XL only.

Limit Switches



SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Ambient temperature to -40 °C

Selection and ordering data

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system		PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

Basic switches · Enclosure width 31 mm (with rounded plunger¹⁾)



Basic switch

With plunger

Snap-action contacts	1 NO + 1 NC	—	⊕ B	3SE5 212-0CC05-1AJ0	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0KC05-1AJ0	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	⊕ B	3SE5 212-0LC05-1AJ0	1	1 unit


For online configurator see www.siemens.com/sirius/configurators.

⊕ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

¹⁾ For enclosures with widths of 31 mm, the basic switch is a complete unit with rounded plungers.

Note:

Selection aid [see page 13/9](#).

Version	Diameter	DT	Modular system		PU (UNIT, SET, M)	PS*
	mm		Order No.	Price per PU		

Operating mechanisms



Roller plunger

Roller plungers, type C acc. to EN 50047

Plastic rollers	10	⊕ B	3SE5 000-0AD03-1AJ0	1	1 unit
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Roller lever

Roller levers, type E acc. to EN 50047

Metal lever, plastic roller	13	⊕ B	3SE5 000-0AE10-1AJ0	1	1 unit
High-grade steel lever, plastic roller	13	⊕ B	3SE5 000-0AE12-1AJ0	1	1 unit



Angular roller lever

Angular roller levers

Metal lever, plastic roller	13	⊕ B	3SE5 000-0AF10-1AJ0	1	1 unit
High-grade steel lever, plastic roller	13	⊕ B	3SE5 000-0AF12-1AJ0	1	1 unit

Twist actuators



Twist actuator

Twist actuators, plastic (without lever)

Switching right and/or left, adjustable		⊕ B	3SE5 000-0AK00-1AJ0	1	1 unit
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Levers for twist actuators



Twist lever

Twist lever straight, 21 mm, type A acc. to EN 50047

Metal lever, plastic roller	19	⊕ B	3SE5 000-0AA21-1AJ0	1	1 unit
High-grade steel lever, plastic roller	19	⊕ B	3SE5 000-0AA31-1AJ0	1	1 unit



Twist lever, adjustable length

Twist levers, adjustable length, with grid hole

Metal lever, plastic roller	19	⊕ B	3SE5 000-0AA60-1AJ0	1	1 unit
High-grade steel lever, plastic roller	19	⊕ B	3SE5 000-0AA62-1AJ0	1	1 unit

⊕ Positively driven actuator, necessary in safety circuits.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Ambient temperature to -40 °C

Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

Complete units · Enclosure width 40 mm



Rounded plunger

Rounded plungers, type B acc. to EN 50041

With high-grade steel plungers, with 3 mm overtravel

Snap-action contacts	1 NO + 1 NC	—	B	3SE5 112-0CC02-1AJ0	1	1 unit
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Twist lever, adjustable length

Twist levers, adjustable length

With high-grade steel lever with grid hole and plastic roller 19 mm

Snap-action contacts	1 NO + 1 NC	—	B	3SE5 112-0CH62-1AJ0	1	1 unit
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For online configurator see www.siemens.com/sirius/configurators.

Positive opening according to IEC 60947-5-1, Appendix K or positively driven actuator, necessary in safety circuits.

Note:

If the device you require is not available as a complete unit, see "Modular System".

Modular system

2, 3 or 4 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system	<input checked="" type="checkbox"/>	PU (UNIT, SET, M)	PS*
				Configurator			
				Order No.	Price per PU		

Basic switches · Enclosure width 40 mm



Basic switch

With M20 □ 1.5 connecting thread

Snap-action contacts	1 NO + 1 NC	—	B	3SE5 112-0CA00-1AJ0	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	B	3SE5 112-0KA00-1AJ0	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	B	3SE5 112-0LA00-1AJ0	1	1 unit

Basic switches · Enclosure width 56 mm



Basic switch

With 3 x M20 x 1.5 connecting thread

Snap-action contacts	1 NO + 1 NC	—	B	3SE5 122-0CA00-1AJ0	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	B	3SE5 122-0KA00-1AJ0	1	1 unit
Snap-action contacts	1 NO + 2 NC	—	B	3SE5 122-0LA00-1AJ0	1	1 unit

Basic switches · Enclosure width 56 mm, XL



Basic switch

With 3 x M20 x 1.5 connecting thread

Slow-action contacts	2 × (1 NO + 1 NC)	—	B	3SE5 162-0BA00-1AJ0	1	1 unit
Snap-action contacts	2 × (1 NO + 1 NC)	—	B	3SE5 162-0CA00-1AJ0	1	1 unit

For online configurator see www.siemens.com/sirius/configurators.

Positive opening according to IEC 60947-5-1, Appendix K or positively driven actuator, necessary in safety circuits.

Note:




















Selection aid [see page 13/9](#).

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures

Ambient temperature to -40 °C

Version		Diameter	DT	Modular system		PU (UNIT, SET, M)	PS*
		mm		Order No.	Price per PU		
Operating mechanisms							
 Rounded plunger	Rounded plungers, type B acc. to EN 50041						
	High-grade steel plungers, with 3 mm overtravel	10	 B	3SE5 000-0AC02-1AJ0		1	1 unit
 Roller plunger	Roller plungers, type C acc. to EN 50041						
	High-grade steel roller, with 3 mm overtravel	10	 B	3SE5 000-0AD02-1AJ0		1	1 unit
 Roller lever	Roller levers						
	Metal lever, plastic roller	13	 B	3SE5 000-0AE01-1AJ0		1	1 unit
	High-grade steel lever, plastic roller	13	 B	3SE5 000-0AE03-1AJ0		1	1 unit
 Angular roller lever	Angular roller levers						
	Metal lever, plastic roller	13	 B	3SE5 000-0AF01-1AJ0		1	1 unit
	High-grade steel lever, plastic roller	13	 B	3SE5 000-0AF03-1AJ0		1	1 unit
Twist actuators							
 Twist actuator	Twist actuators, metal (without lever)						
	Switching right and/or left, adjustable		 B	3SE5 000-0AH00-1AJ0		1	1 unit
 Twist lever	Levers for twist actuators						
	Twist levers, type A acc. to EN 50041						
	Metal lever, plastic roller	19	 B	3SE5 000-0AA01-1AJ0		1	1 unit
 Twist lever, adjustable length	High-grade steel lever, plastic roller	19	 B	3SE5 000-0AA11-1AJ0		1	1 unit
	Twist levers, adjustable length, with grid hole						
	Metal lever, plastic roller	19	 B	3SE5 000-0AA60-1AJ0		1	1 unit
	High-grade steel lever, plastic roller	19	 B	3SE5 000-0AA62-1AJ0		1	1 unit

⊞ Positively driven actuator, necessary in safety circuits.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Compact design

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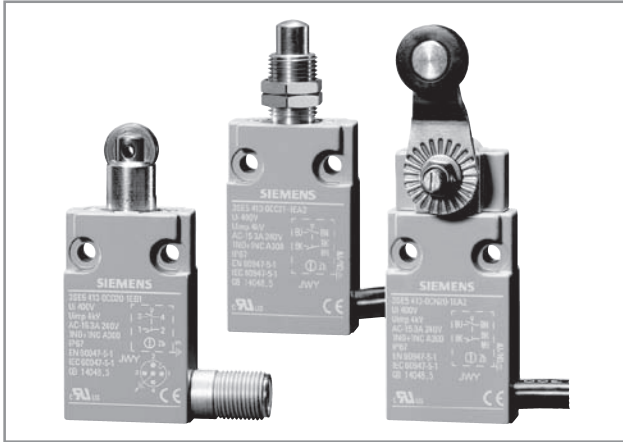
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Overview



Compact design in width 30 mm

Particularly in harsh environments or on equipment with limited space, the small 3SE5 4 position switches in compact design with a depth of 16 mm and a weight of only 80 g (without cable) are ideal. Above all the versions with molded cable can be mounted in the most confined places.

3SE5 4 compact position switches are available in two different widths as complete units:

- The 3SE5 413 series complies with the EU standard and features a 30 mm wide enclosure with drilled holes at a distance of 20 mm.
- The 3SE5 423 series meets the requirements of the US market and features a 40 mm wide enclosure with drilled holes at a spacing of 25 mm.

Both the enclosure and the twist actuator are made of metal and comply with the high IP67 degree of protection. Following actuators are available:

- Rounded plungers
- Rounded plungers with central fixing
- Rounded plungers with external seal
- Roller plungers
- Roller plunger with central fixing
- Twist levers

The contact block is designed with snap-action contacts 1 NO + 1 NC. The NC contact complies with the requirements for positive opening acc. to IEC 60947-5-1.

Use in safety circuits up to Category 4 according to EN ISO 13849-1.

Connection:

- With molded cable, 2 m or 5 m long
- With M12 connector socket

Benefits

- Very compact yet with the same rating as the 3SE51 standard switches, for notable space savings in confined installation conditions
- Various actuator versions available
- Actuator heads rotatable in increments of 90°
- Time is saved when mounting the fully assembled unit
- With metal enclosure of degree of protection IP67, ideal for use in rough industrial environments
- Insensitive to electromagnetic interference








Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Compact design

Selection and ordering data

2 snap-action contacts 1 NO + 1 NC · Degree of protection IP67 · With connecting cable or M12 connector socket

Operating mechanism	Enclosure width	DT	Configurator	PU (UNIT, SET, M)	PS*
	mm		Order No. Price per PU		
Complete units · Enclosure width 30 or 40 mm					
Rounded plungers					
 Rounded plunger	• Standard mounting				
	- With 2 m cable 5 x 0.75 mm ²	30	⊙ A	3SE5 413-0CC20-1EA2	1 1 unit
		40	⊙ ▶ A	3SE5 423-0CC20-1EA2	1 1 unit
	- With 5 m cable 5 x 0.75 mm ²	30	⊙ B	3SE5 413-0CC20-1EA5	1 1 unit
	- With M12 connector socket	30	⊙ A	3SE5 413-0CC20-1EB1	1 1 unit
	40	⊙ A	3SE5 423-0CC20-1EB1	1 1 unit	
 With central fixing	• With central fixing M12 x 1				
	- With 2 m cable 5 x 0.75 mm ²	30	⊙ ▶	3SE5 413-0CC21-1EA2	1 1 unit
		40	⊙ A	3SE5 423-0CC21-1EA2	1 1 unit
 With external seal	• With external seal				
	- With 2 m cable 5 x 0.75 mm ²	30	⊙ A	3SE5 413-0CC22-1EA2	1 1 unit
		40	⊙ A	3SE5 423-0CC22-1EA2	1 1 unit
Roller plungers					
 Roller plunger	• Standard mounting				
	- With 2 m cable 5 x 0.75 mm ²	30	⊙ ▶	3SE5 413-0CD20-1EA2	1 1 unit
		40	⊙ ▶	3SE5 423-0CD20-1EA2	1 1 unit
	- With 5 m cable 5 x 0.75 mm ²	30	⊙ B	3SE5 413-0CD20-1EA5	1 1 unit
	- With M12 connector socket	30	⊙ A	3SE5 413-0CD20-1EB1	1 1 unit
	40	⊙ A	3SE5 423-0CD20-1EB1	1 1 unit	
 With plug	• With central fixing M12 x 1				
	- With 2 m cable 5 x 0.75 mm ²	30	⊙ A	3SE5 413-0CD21-1EA2	1 1 unit
		40	⊙ A	3SE5 423-0CD21-1EA2	1 1 unit
 With plug, enclosure width 40 mm	• Actuator head rotated 90°				
	- With 2 m cable 5 x 0.75 mm ²	30	⊙ A	3SE5 413-0CD23-1EA2	1 1 unit
Twist levers					
 Twist lever	• Standard mounting				
	- With 2 m cable 5 x 0.75 mm ²	30	⊙ ▶	3SE5 413-0CN20-1EA2	1 1 unit
		40	⊙ A	3SE5 423-0CN20-1EA2	1 1 unit
	- With 5 m cable 5 x 0.75 mm ²	30	⊙ A	3SE5 413-0CN20-1EA5	1 1 unit
	- With M12 connector socket	30	⊙ A	3SE5 413-0CN20-1EB1	1 1 unit
	40	⊙ A	3SE5 423-0CN20-1EB1	1 1 unit	

⚙ For online configurator see www.siemens.com/sirius/configurators.

⊙ Positive opening according to IEC 60947-5-1, Appendix K.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, open-type design

Overview



Open-type design





Their compact design makes these switches particularly suitable for use in confined conditions. The fixing dimensions and operating points are according to EN 50047.

The switches are equipped with two or three contacts in slow-action or snap-action versions. The stroke is 6 mm.

The empty enclosure can be equipped with all switch block versions (see page 13/49).

Selection and ordering data

2 or 3 contacts · Degree of protection IP20 (2 contacts), IP10 (3 contacts)

Version	Contacts	DT	Configurator	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
Plastic enclosures • Enclosure width 30 mm							
With teflon plunger, Ø 6 mm							
	Slow-action contacts	1 NO + 1 NC	➡	3SE5 250-0BC05		1	1 unit
	Snap-action contacts	1 NO + 1 NC	➡	3SE5 250-0CC05		1	1 unit
	Slow-action contacts	1 NO + 2 NC	➡	3SE5 250-0KC05		1	1 unit
	Snap-action contacts	1 NO + 2 NC	➡	3SE5 250-0LC05		1	1 unit
	Slow-action contacts with make-before-break	1 NO + 2 NC	➡ A	3SE5 250-0MC05		1	1 unit
	Slow-action contacts	2 NO + 1 NC	➡	3SE5 250-0PC05		1	1 unit
	Empty enclosures without contact block	—	➡ B	3SE5 250-0AC05		1	1 unit
	Contact blocks with 2 contacts for open-type design ¹⁾						
	• Slow-action contacts	1 NO + 1 NC	➡ B	3SE5 050-0BA00		1	1 unit
	• Snap-action contacts	1 NO + 1 NC	➡ B	3SE5 050-0CA00		1	1 unit
	- Standard		➡ B	3SE5 050-0GA00		1	1 unit
	- 2 × 2 mm switching interval		➡ B	3SE5 050-0NA00		1	1 unit
	- Short stroke		➡ B	3SE5 050-0NA00		1	1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators.

➡ Positive opening according to IEC 60947-5-1, Appendix K.

¹⁾ Contact blocks with 3 contacts see page 13/49.

Limit Switches

SIRIUS 3SE5 International Limit Switches

Accessories

Selection and ordering data







Version	DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Plug-in connections for M20 × 1.5 connecting threads							
 3SY3 131	B	Connector sockets (6-pole+PE), for M20×1.5 For max. 250 V, 10 A With 0.75 mm ² connecting cable, plastic, degree of protection IP65, ambient temperature –40 to +90 °C	3SY3 131	1	1 unit	102	0.030
	A	Cable boxes (6-pole + PE)¹⁾ With terminal compartment, can be pre-assembled, plastic, degree of protection IP65	3SY3 136	1	1 unit	102	0.065
 3SY3 127	B	Connector sockets (4-pole), M12, for M20 × 1.5, fixed For max 250 V, 4 A, $U_{imp} = 2500$ V With four 0.25 mm ² connecting cables, plastic, degree of protection IP67, ambient temperature –40 to +85 °C	3SY3 127	1	1 unit	102	0.010
	A	Cable boxes (4-pole), M12, with terminal compartment, can be pre-assembled	3RX8 000-0CB45	1	1 unit	574	0.015
 3RX8 000	A	Angular cable boxes (4-pole), M12, with terminal compartment, can be pre-assembled	3RX8 000-0CC45	1	1 unit	574	0.015
	B	Connector sockets (5-pole), M12, for M20 × 1.5, fixed For max 125 V, 4 A, $U_{imp} = 1500$ V With five 0.25 mm ² connecting cables, plastic, degree of protection IP67, ambient temperature –40 to +85 °C	3SY3 128	1	1 unit	102	0.010
 3SY3 134	A	Cable boxes (5-pole), M12, with terminal compartment, can be pre-assembled	3RX8 000-0CB55	1	1 unit	574	0.016
	A	Angular cable boxes (5-pole), M12, with terminal compartment, can be pre-assembled	3RX8 000-0CC55	1	1 unit	574	0.016
 3SY3 134	B	Connector sockets (8-pole), M12, for M20 × 1.5, fixed, metal version For max 30 V, 2 A, $U_{imp} = 800$ V With eight 0.25 mm ² connecting cables, metal, degree of protection IP67, ambient temperature –40 to +85 °C	3SY3 134	1	1 unit	102	0.025
	A	Cable boxes (8-pole), M12 With 5 m PUR cable, 8 × 0.25 mm ² , IP67	3RX8 000-0CB81-1GF0	1	1 unit	574	0.335
Adaptors for 3SE. (with M 16)							
 3SX1997	▶	metal M16 x 1.5 to 1/2" NPT	3SX1997	1	1 unit		0.022
Adaptors for 3SE2 (with M 20)							
 3SX9918	▶	plastic M20 x 1.5 wire gland	3SB3901-0CK	1	1 unit		0.011
 3SX1998		metal M20 x 1.5 to 1/2" NPT	3SX1998	1	1 unit		0.022
 3SX9918		plastic M20 x 1.5 to 1/2" NPT	3SX9918	1	1 unit		0.012
 3SX9926		plastic cable gland, M20 x 1.5	3SX9926	1	1 unit		0.010
Adaptors for 3SE. (with M 25)							
 3SX1999	▶	metal M 25 x 1.5 to 1/2" NPT	3SX1999	1	1 unit		0.022

¹⁾ For wiring, a crimping tool is necessary, max. conductor cross-section 1 mm².

Limit Switches

SIRIUS 3SE5 International Limit Switches

Accessories and spare parts

Version	Color/ contacts	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
Optional accessories for 3SE52						
	Protective caps, rubber, for rounded plungers acc. to EN 50047, 3SE5 ...-..C05	Black	A	3SE5 000-0AC30	1	1 unit
Spare parts for 3SE51, 3SE52						
	Empty enclosures, plastic	Turquoise				
	Enclosure width 31 mm		B	3SE5 232-0AC05	1	1 unit
	• With increased corrosion protection		B	3SE5 232-0AC05-1CA0	1	1 unit
	Enclosure width 50 mm		B	3SE5 242-0AC05	1	1 unit
	• With increased corrosion protection		B	3SE5 242-0AC05-1CA0	1	1 unit
Empty enclosures, metal						
	Enclosure width 31 mm		B	3SE5 212-0AC05	1	1 unit
	• With increased corrosion protection		B	3SE5 212-0AC05-1CA0	1	1 unit
	Enclosure width 40 mm		B	3SE5 112-0AA00	1	1 unit
	• With increased corrosion protection		B	3SE5 112-0AA00-1CA0	1	1 unit
	Enclosure width 56 mm		B	3SE5 122-0AA00	1	1 unit
	• With increased corrosion protection		B	3SE5 122-0AA00-1CA0	1	1 unit
	Enclosure width 56 mm, XL ¹⁾		B	3SE5 162-0AA00	1	1 unit
Contact blocks with 2 contacts²⁾						
	• Slow-action contacts	1 NO + 1 NC	➡ ➡	3SE5 000-0BA00	1	1 unit
	• Snap-action contacts	1 NO + 1 NC				
	- Standard		➡ B	3SE5 000-0CA00	1	1 unit
	- Gold-plated contacts		➡ B	3SE5 000-0CA00-1AC1	1	1 unit
	- 2 x 2 mm switching interval		➡ B	3SE5 000-0GA00	1	1 unit
	- Short stroke		➡ B	3SE5 000-0NA00	1	1 unit
Contact blocks with 3 contacts						
	• Slow-action contacts	1 NO + 2 NC	➡ B	3SE5 000-0KA00	1	1 unit
	• Snap-action contacts	1 NO + 2 NC	➡ B	3SE5 000-0LA00	1	1 unit
	• Slow-action contacts with make-before-break	1 NO + 2 NC	➡ A	3SE5 000-0MA00	1	1 unit
	• Slow-action contacts	2 NO + 1 NC	A	3SE5 000-0PA00	1	1 unit
Contact blocks for enclosure XL¹⁾						
	• Slow-action contacts	1 NO + 1 NC	➡ B	3SE5 060-0BA00	1	1 unit
	• Snap-action contacts	1 NO + 1 NC	➡ B	3SE5 060-0CA00	1	1 unit
	• Slow-action contacts with make-before-break	1 NO + 2 NC	➡ B	3SE5 060-0MA00	1	1 unit

➡ Positive opening according to IEC 60947-5-1, Appendix K.







1) Equip XL enclosures only with contact combinations according to pages 12/11, 12/42 and 12/43.

2) Unsuitable for open-type position switches; see page 13/47.

Limit Switches

SIRIUS 3SE5 International Limit Switches

Accessories and spare parts

Version	Rated voltage LED	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
V						
Spare parts for 3SE51, 3SE52						
 31 mm, turquoise with LED	Covers for plastic enclosures, width 31 mm					
	• Turquoise with LED	24 DC	B	3SE5 230-1AA00	1	1 unit
		230 AC	B	3SE5 230-3AA00	1	1 unit
	• Yellow	—	B	3SE5 230-0AA00-1AG0	1	1 unit
	• Yellow with LED	24 DC	B	3SE5 230-1AA00-1AG0	1	1 unit
		230 AC	B	3SE5 230-3AA00-1AG0	1	1 unit
 40 mm, yellow with LED	Covers for plastic enclosures, width 40 mm					
	• Turquoise with LED	24 DC	B	3SE5 130-1AA00	1	1 unit
		230 AC	B	3SE5 130-3AA00	1	1 unit
	• Yellow	—	B	3SE5 130-0AA00-1AG0	1	1 unit
	• Yellow with LED	24 DC	B	3SE5 130-1AA00-1AG0	1	1 unit
		230 AC	B	3SE5 130-3AA00-1AG0	1	1 unit
 50 mm, turquoise with LED	Covers for plastic enclosures, width 50 mm					
	• Turquoise with LED	24 DC	B	3SE5 240-1AA00	1	1 unit
		230 AC	B	3SE5 240-3AA00	1	1 unit
	• Yellow	—	B	3SE5 240-0AA00-1AG0	1	1 unit
	• Yellow with LED	24 DC	B	3SE5 240-1AA00-1AG0	1	1 unit
		230 AC	B	3SE5 240-3AA00-1AG0	1	1 unit
 31 mm, turquoise with LED	Covers for metal enclosures, width 31 mm					
	• Turquoise with LED	24 DC	B	3SE5 210-1AA00	1	1 unit
		230 AC	B	3SE5 210-3AA00	1	1 unit
	• Yellow	—	B	3SE5 210-0AA00-1AG0	1	1 unit
	• Yellow with LED	24 DC	B	3SE5 210-1AA00-1AG0	1	1 unit
		230 AC	B	3SE5 210-3AA00-1AG0	1	1 unit
 40 mm, yellow with LED	Covers for metal enclosures, width 40 mm					
	• Turquoise with LED	24 DC	B	3SE5 110-1AA00	1	1 unit
		230 AC	B	3SE5 110-3AA00	1	1 unit
	• Yellow	—	B	3SE5 110-0AA00-1AG0	1	1 unit
	• Yellow with LED	24 DC	B	3SE5 110-1AA00-1AG0	1	1 unit
		230 AC	B	3SE5 110-3AA00-1AG0	1	1 unit
 56 mm, yellow with LED	Covers for metal enclosures, width 56 mm					
	• Turquoise with LED	24 DC	B	3SE5 120-1AA00	1	1 unit
		230 AC	B	3SE5 120-3AA00	1	1 unit
	• Yellow	—	B	3SE5 120-0AA00-1AG0	1	1 unit
	• Yellow with LED	24 DC	B	3SE5 120-1AA00-1AG0	1	1 unit
		230 AC	B	3SE5 120-3AA00-1AG0	1	1 unit
	Covers for XL metal enclosures, width 56 mm					
	• Yellow	—	B	3SE5 160-0AA00-1AG0	1	1 unit

Technical specifications

Type		3SE5 1..., 3SE5 2..	3SE5 41.	3SE5 42.
General data				
Standards		IEC 60947-5-1, EN 60947-5-1		
Rated insulation voltage U_i	V	400	400	
Pollution degree acc. to IEC 60664-1		Class 3	Class 3	
Rated impulse withstand voltage U_{imp}	kV	6	4	
Rated operational voltage U_e	V	400 V AC, over 300 V AC only for equal potential ¹⁾		300 AC
Conventional thermal current I_{th}	A	10	6	10
Rated operational current I_e		2-pole	3-pole	2-pole
• With alternating current 50/60 Hz		I_e /AC-15	I_e /AC-15	I_e /AC-15
- At 24 V	A	6	6	6
- At 120 V	A	6	3	6
- At 240 V	A	3	1.5	3
• For direct current		I_e /DC-13	I_e /DC-13	I_e /DC-13
- At 24 V	A	3	3	3
- At 125 V	A	0.55	0.55	0.55
- At 250 V	A	0.27	0.27	0.27
Short-circuit protection²⁾				
• With DIAZED fuse links, gG operational class	A	6		
• With miniature circuit breaker, Char. C	A	1	2	1
Mechanical endurance				
• Basic switches		15 × 10 ⁶ operating cycles	30 × 10 ⁶ operating cycles	30 × 10 ⁶ operating cycles
• With spring rod, 3SE5 ...-...R..		10 × 10 ⁶ operating cycles	—	—
• With fork lever 3SE5 1...-...T..		1 × 10 ⁶ operating cycles	—	—
Electrical endurance				
• With 3RH.1, 3RT contactors in size S00, S0		10 × 10 ⁶ operating cycles	10 × 10 ⁶ operating cycles	5 × 10 ⁶ operating cycles
• For utilization category AC-15 when switching off I_e /AC-15 at 240 V		0.1 × 10 ⁶ operating cycles	—	—
• With utilization category DC-12/DC-13		For direct current depending on the loading of the switch		
Switching frequency		6000 operating cycles/h	1800 operating cycles/h	
With 3RH.1, 3RT contactors in size S00, S0				
Switching accuracy	mm	0.05		
For repeated switching, measured at the plunger of the contact block				
• With twist actuators		1°		
Rated data acc. to \mathbb{E}, \mathbb{U} and \mathbb{A}				
• Rated voltage	V	300		
• Uninterrupted current	A	6		
• Switching capacity		Heavy duty, A 300 / B 300 / Q 300	A 300 / Q 300	

¹⁾ For slow-action contacts 1 NO + 2 NC with make-before-break and 2 NO + 1 NC the following applies: over 250 V AC only equal potential

²⁾ Without any welds according to IEC 60947-5-1.

Type		3SE5 23.	3SE5 13	3SE5 24.	3SE5 21.	3SE5 11.	3SE5 12., 3SE5 16.	3SE5 4..	3SE5 25.
Enclosure									
Enclosure									
• Material		Ultramid A3X2G7			Zinc diecasting GD Zn Al4 Cu1				—
• Width	mm	31	40	50	31	40	56	30 / 40	30
Degree of protection acc. to IEC 60529		IP65		IP66/IP67 ¹⁾				IP67	IP20, IP10
Ambient temperature									
• During operation	°C	–25 ... +85							–25 ... +85
• In operation, switch with LEDs	°C	–25 ... +70							—
• Storage, transport	°C	–40 ... +90							–40 ... +90
Mounting position		Any							
Connection									
Cable entry		1 × (M20 × 1.5)		2 × (M20 × 1.5)	1 × (M20 × 1.5)		3 × (M20 × 1.5)	—	—
Conductor cross-sections ²⁾									
• Solid	mm²	2 × (0.5 ... 0.75), 1 × (0.5 ... 1.5)							
• Finely stranded with end sleeve	mm²	2 × (0.5 ... 1.5)							
Tightening torque, contact block		0.8 ... 1.0							
Protective conductor connection inside enclosure		—			M3.5			—	—

¹⁾ For twist actuators with spring rod and rod actuators: IP65/IP67.

²⁾ For the maximum number of connectable conductors for the respective contact block see operating instructions.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure widths 31 mm and 50 mm

Configuration

Actuation and operating travel (angle) for enclosure width 31 mm and 50 mm

Operation by bar (standard) ⊙ Operating point acc. to EN 50047 (snap-action) * Operating point on return (snap-action) → Positive opening acc. to EN 60947-5-1 → Direction of operation v _{max} Max. actuating speed ■ Contact closed □ Contact open	Slow-action contacts 1 NO + 1 NC Ident. No. 11	Snap-action contacts 1 NO + 1 NC Ident. No. 11	1 NO + 2 NC Ident. No. 12				
Rounded plungers, type B 3SE5 2...-C05 v _{max} = 1 m/s Minimum force required in direction of operation: 18 N	Actuation along plunger axis -BC05 Ident. No. 11	Actuation along plunger axis -KC05 Ident. No. 12	Actuation along plunger axis -CC05, -HC05 Ident. No. 11	-FC05 Short stroke	-GC05 Switching interval 2 x 2 mm	-LC05 Ident. No. 12	
Angular roller levers 3SE5 2...-F1 v _{max} = 1 m/s Minimum force required in direction of operation: 9 N	Actuation along plunger axis -BF10 Ident. No. 11	Actuation along plunger axis -KF10 Ident. No. 12	Actuation along plunger axis -HF10 Ident. No. 11	-FC05 + head¹⁾ Short stroke	-GC05 + head¹⁾ Switching interval 2 x 2 mm	-LF10 Ident. No. 12	
Operation by bar (standard) ⊙ Operating point acc. to EN 50047 (snap-action) * Operating point on return (snap-action) → Positive opening acc. to EN 60947-5-1 → Direction of operation v _{max} Max. actuating speed ■ Contact closed □ Contact open	Slow-action contacts ■ Contact closed □ Contact open	Snap-action contacts ■ Contact closed □ Contact open					
Roller plungers 3SE5 2...-D03, -D04 Form C v _{max} = 1 m/s Minimum force required in direction of operation: 18 N	3SE5 2...-D10, -D11 Central fixing v _{max} = 1 m/s Minimum force required in direction of operation: 18 N	Lateral actuation 1 NO + 1 NC Ident. No. 11	3SE5 2...-BD03 Ident. No. 11	Lateral actuation 1 NO + 1 NC Ident. No. 11	3SE5 2...-HD03, -HD10 Ident. No. 11	3SE5 2...-FC05 + head¹⁾ Ident. No. 11	3SE5 2...-LD03 Ident. No. 12

¹⁾ The basic switch and actuator head/actuator head must be ordered separately.

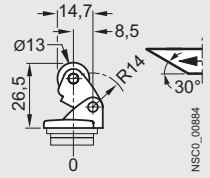
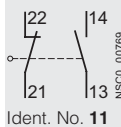
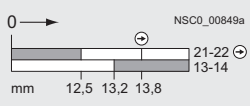
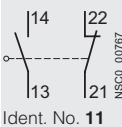
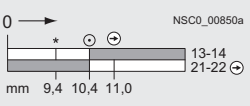
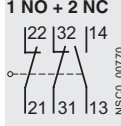
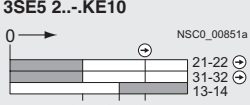
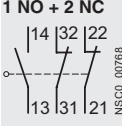
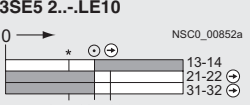
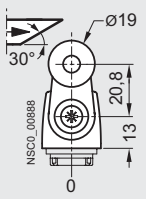
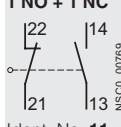
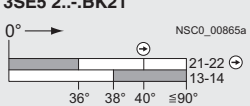
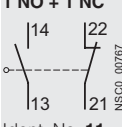
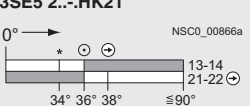
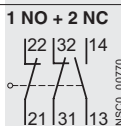
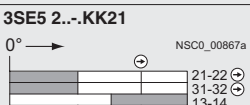
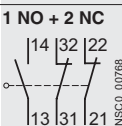
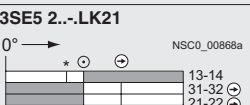
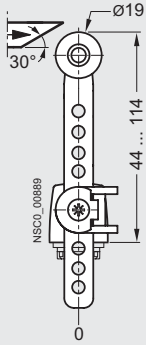
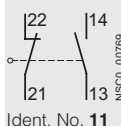
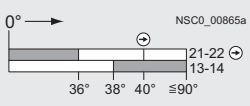
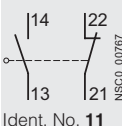
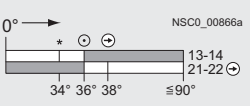
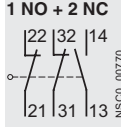
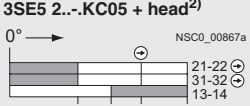
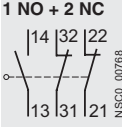
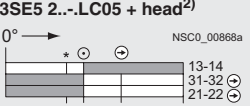
Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure widths 31 mm and 50 mm

Configuration

Actuation and operating travel (angle) for enclosure width 31 mm and 50 mm

Operation by bar (standard)	Slow-action contacts	Snap-action contacts
<ul style="list-style-type: none"> ○ Operating point acc. to EN 50047 (snap-action) * Operating point on return (snap-action) ⊕ Positive opening acc. to EN 60947-5-1 → Direction of operation v_{max} Max. actuating speed 	<ul style="list-style-type: none"> ■ Contact closed □ Contact open 	<ul style="list-style-type: none"> ■ Contact closed □ Contact open
Roller levers, type E		
3SE5 2...-E1.  $v_{max} = 1 \text{ m/s}$ Minimum force required in direction of operation: 9 N	Lateral actuation 1 NO + 1 NC  3SE5 2...-BE10  Ident. No. 11	Lateral actuation 1 NO + 1 NC  3SE5 2...-HE10  Ident. No. 11
	1 NO + 2 NC  3SE5 2...-KE10  Ident. No. 12	1 NO + 2 NC  3SE5 2...-LE10  Ident. No. 12
Twist levers¹⁾, type A		
3SE5 2...-K2.  $v_{max} = 1.5 \text{ m/s}$ Minimum torque in direction of operation: 0.25 Nm	Deflection in direction of rotation 1 NO + 1 NC  3SE5 2...-BK21  Ident. No. 11	Deflection in direction of rotation 1 NO + 1 NC  3SE5 2...-HK21  Ident. No. 11
	1 NO + 2 NC  3SE5 2...-KK21  Ident. No. 12	1 NO + 2 NC  3SE5 2...-LK21  Ident. No. 12
Twist levers¹⁾, adjustable length		
3SE5 2...-K6.  $v_{max} = 1.5 \text{ m/s}$ Minimum torque in direction of operation: 0.25 Nm	Deflection in direction of rotation 1 NO + 1 NC  3SE5 2...-BC05 + head²⁾  Ident. No. 11	Deflection in direction of rotation 1 NO + 1 NC  3SE5 2...-HK60  Ident. No. 11
	1 NO + 2 NC  3SE5 2...-KC05 + head²⁾  Ident. No. 12	1 NO + 2 NC  3SE5 2...-LC05 + head²⁾  Ident. No. 12

¹⁾ Adjustment of the lever in increments of 10°, maximum deflection 90°.

²⁾ The basic switch and actuator head must be ordered separately.

Limit Switches

SIRIUS 3SE5 International Limit Switches

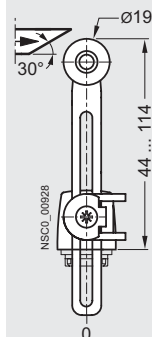
3SE5, plastic enclosures
Enclosure widths 31 mm and 50 mm

Operation by bar (standard)

- Operating point acc. to EN 50041/47 (snap-action)
- * Operating point on return (snap-action)
- ⊕ Positive opening acc. to EN 60947-5-1
- Direction of operation
- v_{max} Max. actuating speed

Twist levers¹⁾, adjustable length

3SE5 2...-K5.

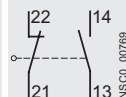


$xv_{max} = 1.5 \text{ m/s}$
 Minimum torque
 in direction of operation: 0.25 Nm

Slow-action contacts

- Contact closed
- Contact open

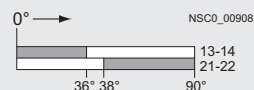
1 NO + 1 NC



Ident. No. 11

Deflection in direction of rotation

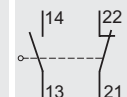
3SE5 2...-BK50



Snap-action contacts

- Contact closed
- Contact open

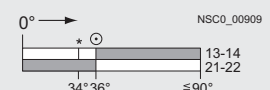
1 NO + 1 NC



Ident. No. 11

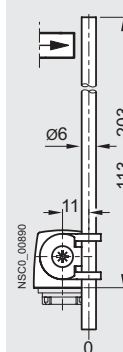
Deflection in direction of rotation

3SE5 2...-HK50



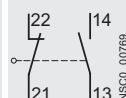
Rod actuators¹⁾, type D

3SE5 2...-K8.



$v_{max} = 1.5 \text{ m/s}$
 Minimum torque
 in direction of operation: 0.25 Nm

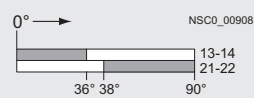
1 NO + 1 NC



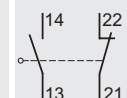
Ident. No. 11

Deflection in direction of rotation

3SE5 2...-BC05 + head²⁾



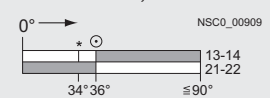
1 NO + 1 NC



Ident. No. 11

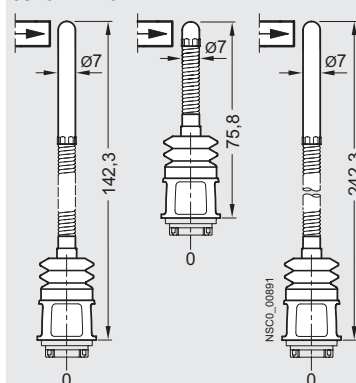
Deflection in direction of rotation

3SE5 2...-HK80, -HK82



Spring rods

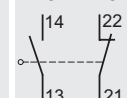
3SE5 2...-R0.



$v_{max} = 1 \text{ m/s}$
 Minimum force required
 in direction of operation: 9 N

The spring rods can be used only with snap-action contacts.

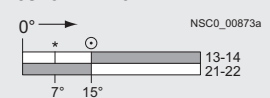
1 NO + 1 NC



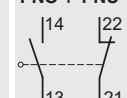
Ident. No. 11

Deflection of spring rod

3SE5 2...-HR01

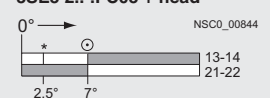


1 NO + 1 NC

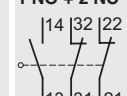


Ident. No. 11

3SE5 2...-FC05 + head²⁾

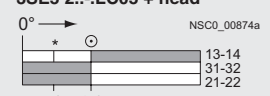


1 NO + 2 NC



Ident. No. 12

3SE5 2...-LC05 + head²⁾



¹⁾ Adjustment of the lever in increments of 10°, maximum deflection 90°.

²⁾ The basic switch and actuator head must be ordered separately.

Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, metal enclosures
Enclosure widths 40 mm and 56 mm

1
2
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13

Configuration

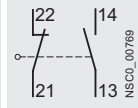
Actuation and operating travel (angle) for enclosure width 40 mm and 56 mm

Operation by bar (standard)

- Operating point acc. to EN 50041 (snap-action)
- * Operating point on return (snap-action)
- Positive opening acc. to EN 60947-5-1
- Direction of operation
- v_{max} Max. actuating speed
- Contact closed
- Contact open

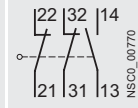
Slow-action contacts

1 NO + 1 NC



Ident. No. 11

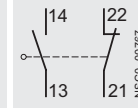
1 NO + 2 NC



Ident. No. 12

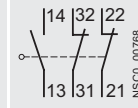
Snap-action contacts

1 NO + 1 NC



Ident. No. 11

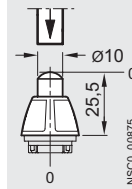
1 NO + 2 NC



Ident. No. 12

Rounded plungers, type B

3SE5 1...-C02

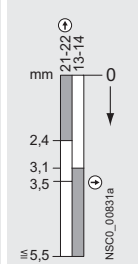


$v_{max} = 1.5 \text{ m/s}$

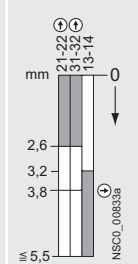
Minimum force required in direction of operation: 18 N

Actuation along plunger axis

3SE5 1...-BC02

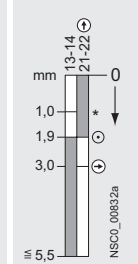


3SE5 1...-KC02

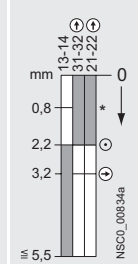


Actuation along plunger axis

3SE5 1...-CC02

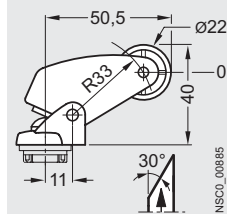


3SE5 1...-LC02



Angular roller levers

3SE5 112...F0.

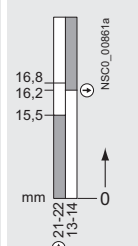


$v_{max} = 2.5 \text{ m/s}$

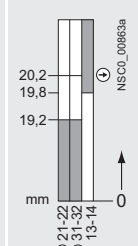
Minimum force required in direction of operation: 9 N

Actuation along plunger axis

3SE5 1...-BF01

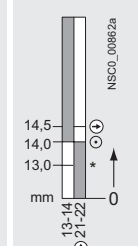


3SE5 1...-KA00 + head¹⁾

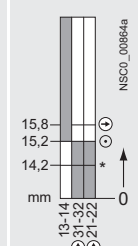


Actuation along plunger axis

3SE5 1...-CF01



3SE5 1...-LF01



Operation by bar (standard)

- Operating point acc. to EN 50041 (snap-action)
- * Operating point on return (snap-action)
- Positive opening acc. to EN 60947-5-1
- Direction of operation
- v_{max} Max. actuating speed
- Contact closed
- Contact open

Slow-action contacts

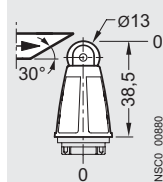
- Contact closed
- Contact open

Snap-action contacts

- Contact closed
- Contact open

Roller plungers, type C

3SE5 1...-D02

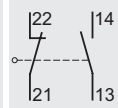


$v_{max} = 1 \text{ m/s}$

Minimum force required in direction of operation: 18 N

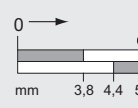
Lateral actuation

1 NO + 1 NC

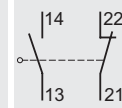


Ident. No. 11

3SE5 1...-BD02



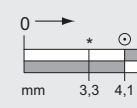
1 NO + 1 NC



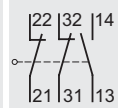
Ident. No. 11

Lateral actuation

3SE5 1...-CD02

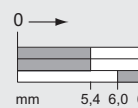


1 NO + 2 NC

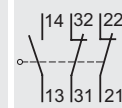


Ident. No. 12

3SE5 1...-KD02

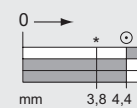


1 NO + 2 NC



Ident. No. 12

3SE5 1...-LD02



¹⁾ The basic switch and actuator head must be ordered separately.

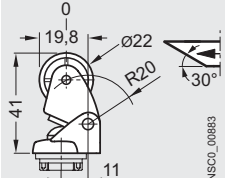
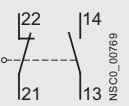
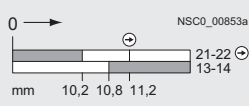
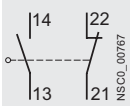
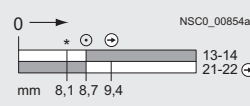
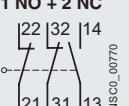
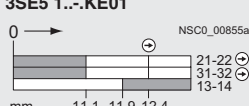
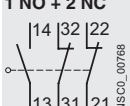
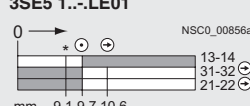
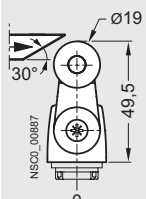
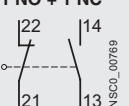
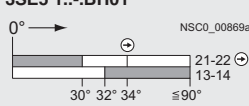
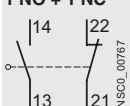
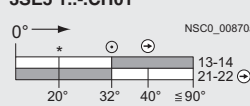
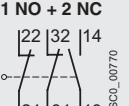
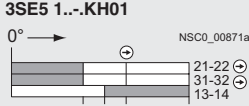
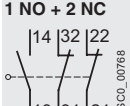
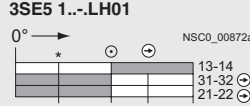
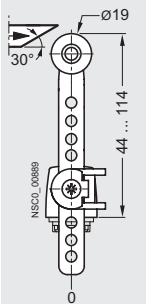
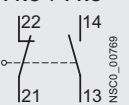
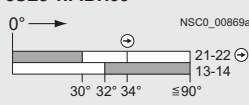
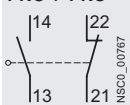
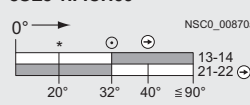
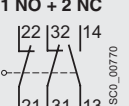
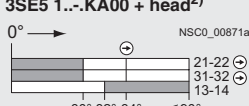
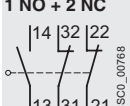
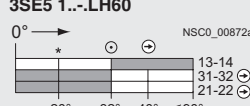
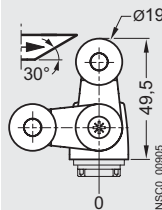
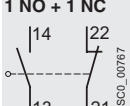
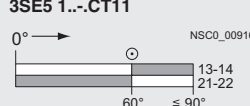
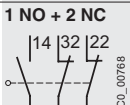
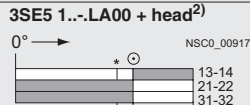
Limit Switches

SIRIUS 3SE5 International Limit Switches

3SE5, plastic enclosures
Enclosure widths 31 mm and 50 mm

Configuration

Actuation and operating travel (angle) for enclosure width 40 mm and 56 mm

Operation by bar (standard)		Slow-action contacts		Snap-action contacts	
<ul style="list-style-type: none"> Operating point acc. to EN 50041 (snap-action) * Operating point on return (snap-action) Positive opening acc. to EN 60947-5-1 → Direction of operation v_{max} Max. actuating speed 		<ul style="list-style-type: none"> Contact closed Contact open 		<ul style="list-style-type: none"> Contact closed Contact open 	
Roller levers		Lateral actuation		Lateral actuation	
3SE5 1...-E0.  $v_{max} = 2.5 \text{ m/s}$ Minimum force required in direction of operation: 9 N		1 NO + 1 NC  Ident. No. 11	3SE5 1...-BE01  Ident. No. 11	1 NO + 1 NC  Ident. No. 11	3SE5 1...-CE01  Ident. No. 11
		1 NO + 2 NC  Ident. No. 12	3SE5 1...-KE01  Ident. No. 12	1 NO + 2 NC  Ident. No. 12	3SE5 1...-LE01  Ident. No. 12
Twist levers ¹⁾ , type A		Deflection in direction of rotation		Deflection in direction of rotation	
3SE5 1...-H0.  $v_{max} = 1.5 \text{ m/s}$ Minimum torque in direction of operation: 0.25 Nm		1 NO + 1 NC  Ident. No. 11	3SE5 1...-BH01  Ident. No. 11	1 NO + 1 NC  Ident. No. 11	3SE5 1...-CH01  Ident. No. 11
		1 NO + 2 NC  Ident. No. 12	3SE5 1...-KH01  Ident. No. 12	1 NO + 2 NC  Ident. No. 12	3SE5 1...-LH01  Ident. No. 12
Twist levers ¹⁾ , adjustable length		Deflection in direction of rotation		Deflection in direction of rotation	
3SE5 1...-H6.  $v_{max} = 1.5 \text{ m/s}$ Minimum torque in direction of operation: 0.25 Nm		1 NO + 1 NC  Ident. No. 11	3SE5 1...-BH60  Ident. No. 11	1 NO + 1 NC  Ident. No. 11	3SE5 1...-CH60  Ident. No. 11
		1 NO + 2 NC  Ident. No. 12	3SE5 1...-KA00 + head²⁾  Ident. No. 12	1 NO + 2 NC  Ident. No. 12	3SE5 1...-LH60  Ident. No. 12
Fork levers ¹⁾		The fork levers can be used only with snap-action contacts.		Deflection in direction of rotation	
3SE5 1...-T1.  $v_{max} = 1.5 \text{ m/s}$ Minimum torque in direction of operation: 0.25 Nm				1 NO + 1 NC  Ident. No. 11	3SE5 1...-CT11  Ident. No. 11
				1 NO + 2 NC  Ident. No. 12	3SE5 1...-LA00 + head²⁾  Ident. No. 12

¹⁾ Adjustment of the lever in increments of 10°, maximum deflection 90°.

²⁾ The basic switch and actuator head must be ordered separately.

Limit Switches

SIRIUS 3SE5 International Limit Switches

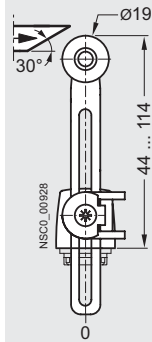
3SE5, metal enclosures
Enclosure widths 40 mm and 56 mm

Operation by bar (standard)

- Operating point acc. to EN 50041/47 (snap-action)
- * Operating point on return (snap-action)
- ➔ Positive opening acc. to EN 60947-5-1
- Direction of operation
- v_{ma} Max. actuating speed

Twist levers¹⁾, adjustable length

3SE5 1...-H5.

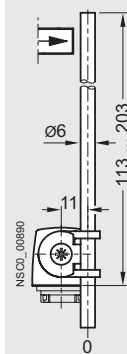


$v_{max} = 1.5 \text{ m/s}$

Minimum torque
in direction of operation: 0.25 Nm

Rod actuators¹⁾, type D

3SE5 1...-H8.

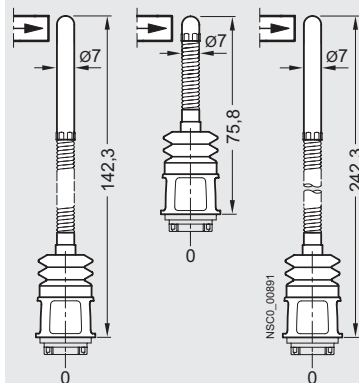


$v_{max} = 1.5 \text{ m/s}$

Minimum torque
in direction of operation: 0.25 Nm

Spring rods

3SE5 1...-R0.



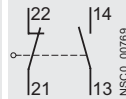
$v_{max} = 1 \text{ m/s}$

Minimum force required
in direction of operation: 9 N

Slow-action contacts

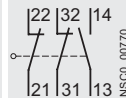
- Contact closed
- Contact open

1 NO + 1 NC



Ident. No. 11

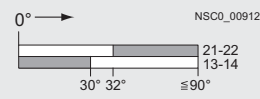
1 NO + 2 NC



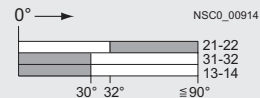
Ident. No. 12

Deflection in direction of rotation

3SE5 1...-BH50



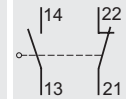
3SE5 1...-KA00 + head²⁾



Snap-action contacts

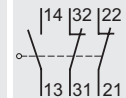
- Contact closed
- Contact open

1 NO + 1 NC



Ident. No. 11

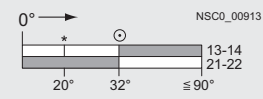
1 NO + 2 NC



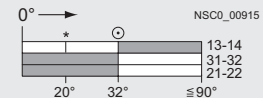
Ident. No. 12

Deflection in direction of rotation

3SE5 1...-CH50, -CH51

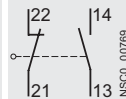


3SE5 1...-LH50



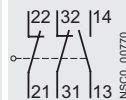
Deflection in direction of rotation

1 NO + 1 NC



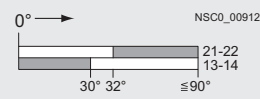
Ident. No. 11

1 NO + 2 NC

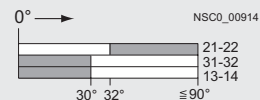


Ident. No. 12

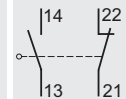
3SE5 1...-BA00 + head²⁾



3SE5 1...-KA00 + head²⁾

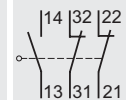


1 NO + 1 NC



Ident. No. 11

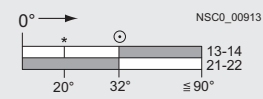
1 NO + 2 NC



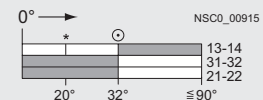
Ident. No. 12

Deflection in direction of rotation

3SE5 1...-CH80, -CH82

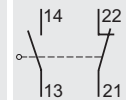


3SE5 1...-LA00 + head²⁾



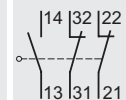
The spring rods can be used only with snap-action contacts.

1 NO + 1 NC



Ident. No. 11

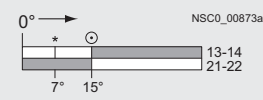
1 NO + 2 NC



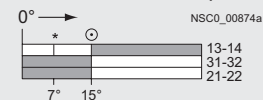
Ident. No. 12

Deflection of spring rod

3SE5 1...-CR01



3SE5 1...-LA00 + head²⁾



¹⁾ Adjustment of the lever in increments of 10°, maximum deflection 90°.

²⁾ The basic switch and actuator head must be ordered separately.

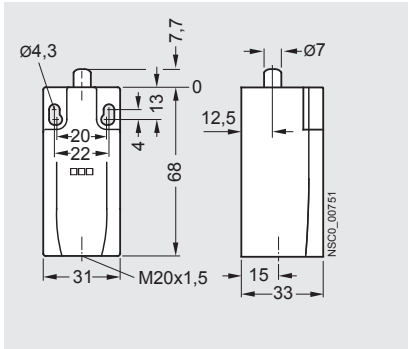
Limit Switches

SIRIUS 3SE5 International Limit Switches

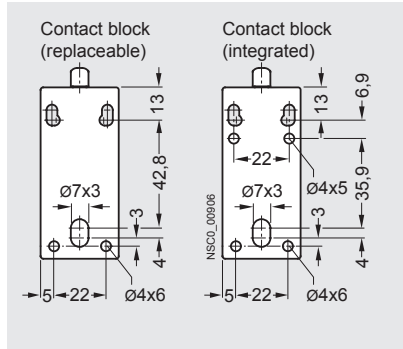
Dimensional drawings

Dimensions of the basic switches

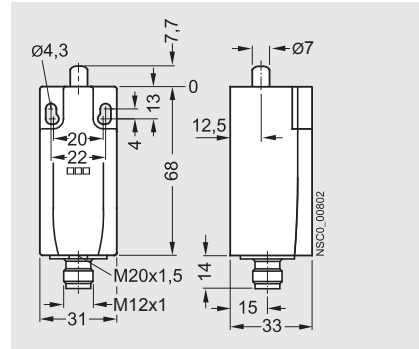
Enclosure width 31 mm, EN 50047,
with M20 × 1.5 connecting thread
3SE5 232, 3SE5 212



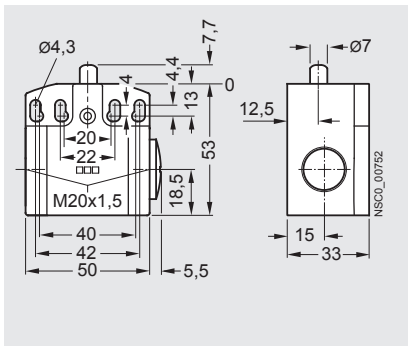
Enclosure width 31 mm, EN 50047,
rear with fixing holes
3SE5 232, 3SE5 212



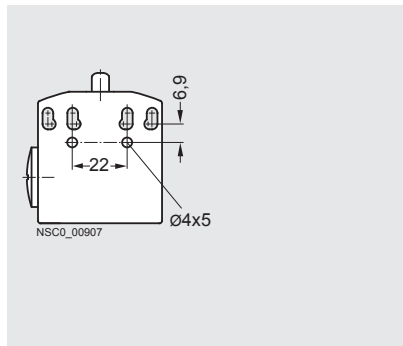
Enclosure width 31 mm, EN 50047,
with M12 connector socket
3SE5 234, 3SE5 212



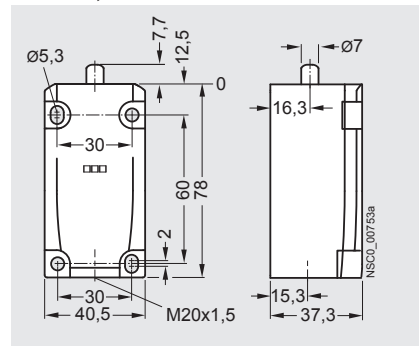
Enclosure width 50 mm,
with M20 × 1.5 connecting thread
3SE5 242



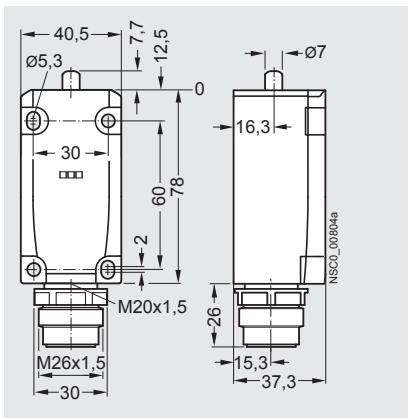
Enclosure width 50 mm,
rear with fixing holes
3SE5 242



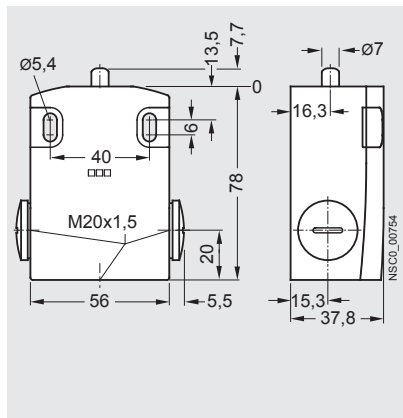
Enclosure width 40 mm, EN 50041,
with M20 × 1.5 connecting thread
3SE5 112, 3SE5 132



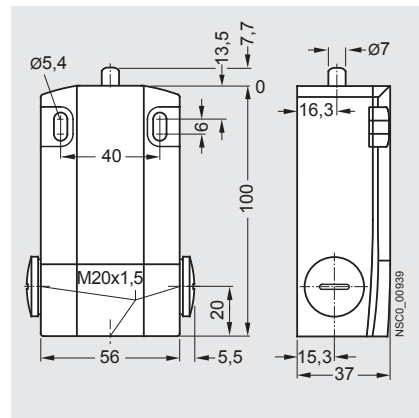
Enclosure width 40 mm, EN 50041,
with 6-pole connector socket
3SE5 115



Enclosure width 56 mm,
with M20 × 1.5 connecting thread
3SE5 122



XL enclosure, width 56 mm,
with M20 × 1.5 connecting thread
3SE5 162



Operating mechanisms for basic switches,
[see pages 13/59 and 13/60.](#)

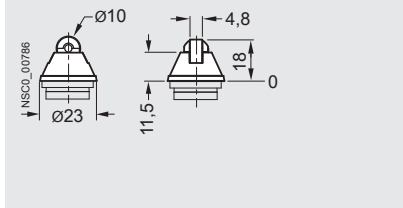
Limit Switches

SIRIUS 3SE5 International Limit Switches

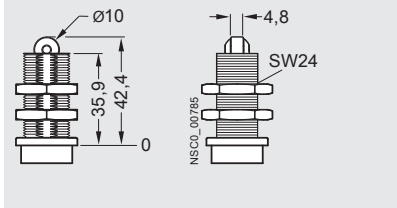
3SE5, open-type design

Operating mechanisms for enclosure width 31 mm and 50 mm

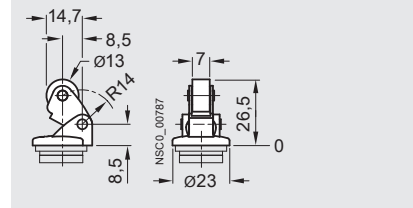
Roller plunger, type C acc. to EN 50047



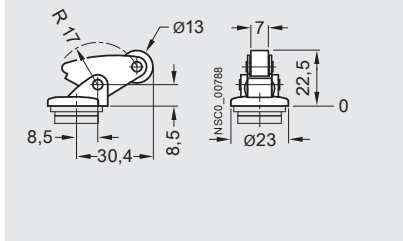
Roller plunger with central fixing



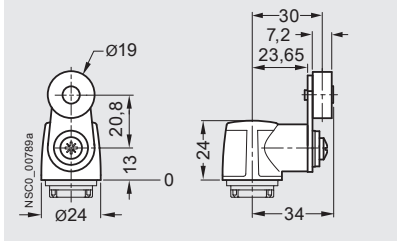
Roller lever, type E acc. to EN 50047



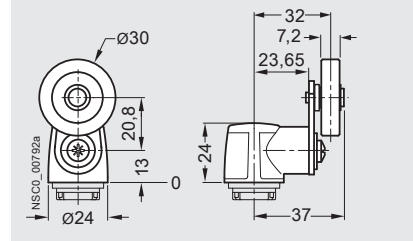
Angular roller lever



Twist lever, type A acc. to EN 50047



Twist lever, roller 30 mm

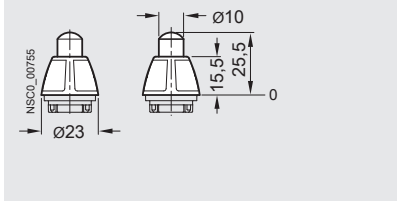


Operating mechanism for enclosure width 40 mm and 56 mm

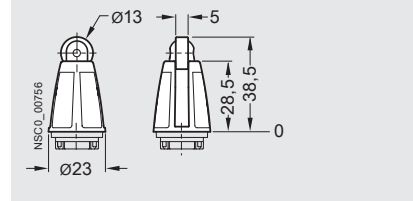
Plain plunger



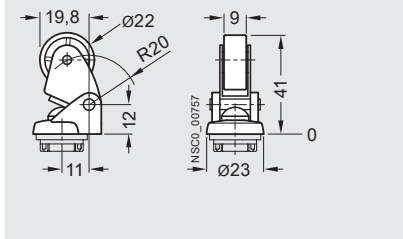
Rounded plunger, type B acc. to EN 50041



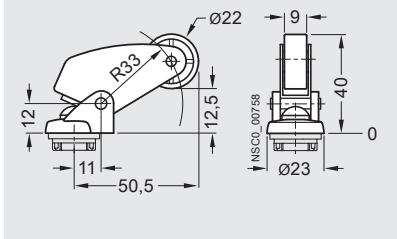
Roller plunger, type C acc. to EN 50041



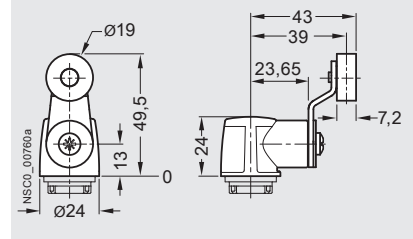
Roller lever



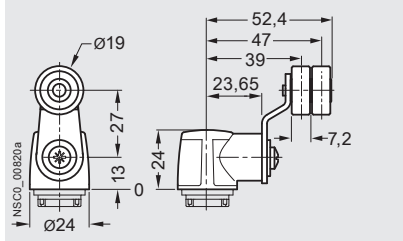
Angular roller lever



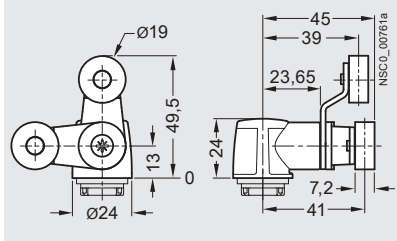
Twist lever, type A acc. to EN 50041



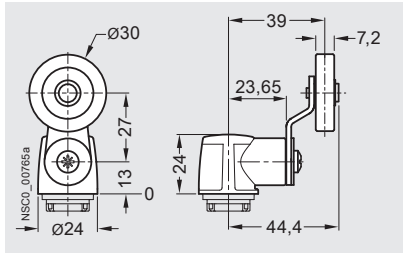
Twist lever, 2 rollers 19 mm



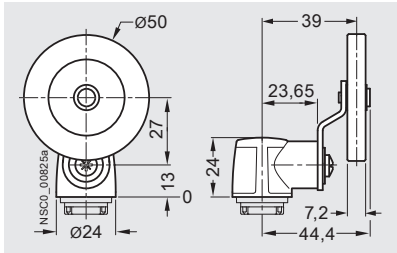
Fork lever, roller 19 mm



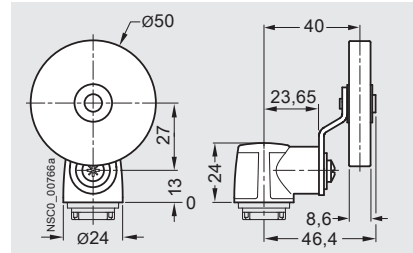
Twist lever, roller 30 mm



Twist lever, roller 50 mm



Twist lever, rubber roller 50 mm



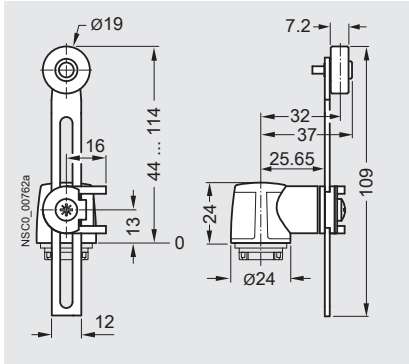
Limit Switches

SIRIUS 3SE5 International Limit Switches

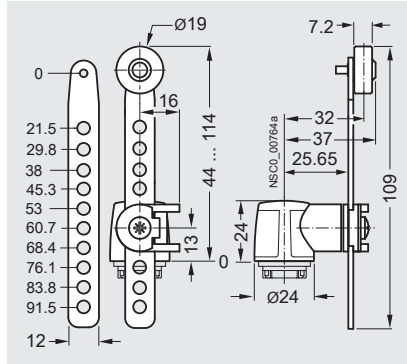
Dimensional drawings

Operating mechanisms for all enclosure widths

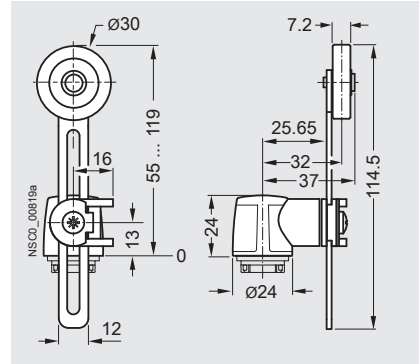
Twist lever, adjustable length, roller 19 mm



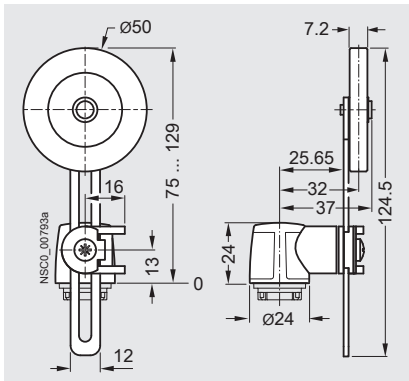
Twist lever, adjustable length, with grid hole, roller 19 mm



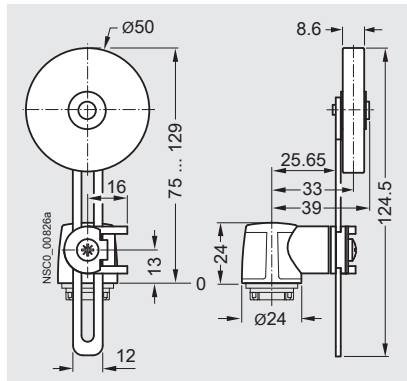
Twist lever, adjustable length, roller 30 mm



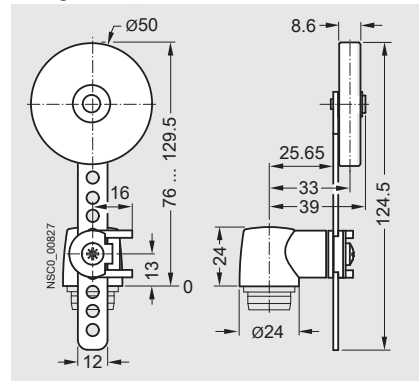
Twist lever, adjustable length, roller 50 mm



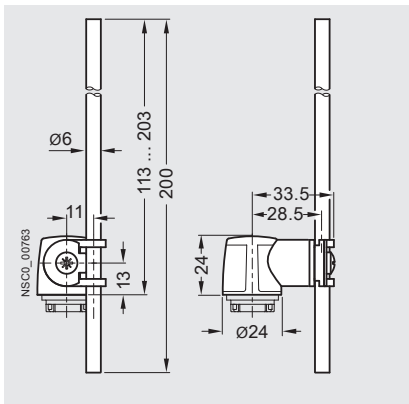
Twist lever, adjustable length, rubber roller 50 mm



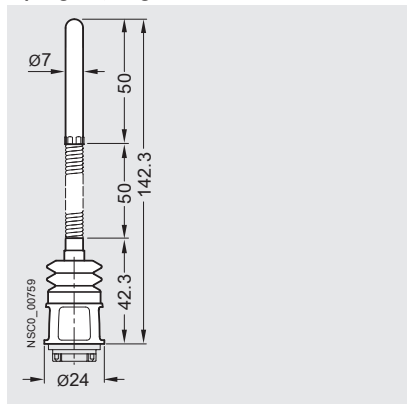
Twist lever, adjustable length, with grid hole, rubber roller 50 mm



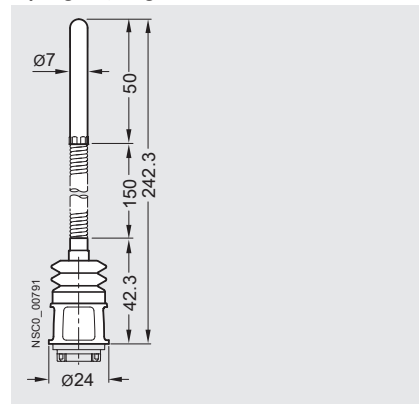
Rod actuator



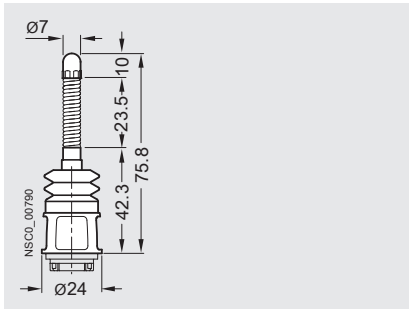
Spring rod, length 142.5 mm



Spring rod, length 242.5 mm



Spring rod, length 76 mm



Limit Switches

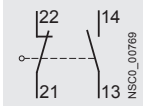
SIRIUS 3SE5 International Limit Switches

Dimensional drawings

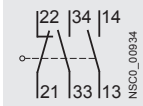
Circuit diagrams

Enclosure widths 31, 40, 50 and 56 mm

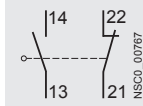
Slow-action contacts
1 NO + 1 NC
3SE5 ...-B..., -R...



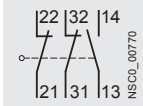
Slow-action contacts
2 NO + 1 NC
3SE5 ...-P...



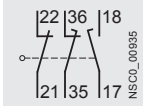
Snap-action contacts
1 NO + 1 NC
3SE5 ...-C..., -F..., -G..., -H..., -N...



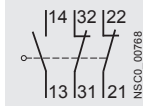
Slow-action contacts
1 NO + 2 NC
3SE5 ...-K..., -Q...



Slow-action contacts
1 NO + 2 NC with make-before-break, 3SE5 ...-M...

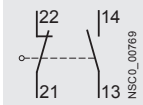


Snap-action contacts
1 NO + 2 NC
3SE5 ...-L...

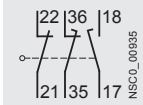


XL enclosures, width 56 mm

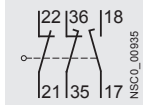
Slow-action contacts
2 x (1 NO + 1 NC)
3SE5 162-0B...



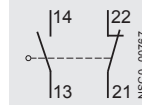
Slow-action contacts
2 x (1 NO + 2 NC) with make-before-break, 3SE5 162-0D...



For slow-action contacts
1 NO + 2 NC with make-before-break, 1 NO + 1 NC, 3SE5 162-0E...

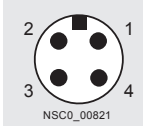


Snap-action contacts
2 x (1 NO + 1 NC)
3SE5 162-0C...

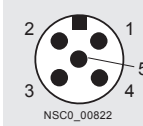


3SE5 connector assignment

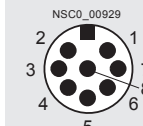
M12 connector socket, 4-pole
3SY3 127



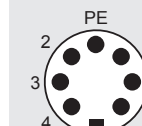
M12 connector socket, 5-pole
3SY3 128



M12 connector socket, 8-pole
3SY3 134



Connector sockets, 6-pole + PE
3SY3 131



Order No.	Connector sockets	Contacts	LEDs	Connections								
	Type	Version	Version	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	PE
M12 connector sockets (4-, 5- or 8-pole)												
3SE5..4-0.....1AC4	3SY3 127	1 NO + 1 NC	—	21	22	13	14	—	—	—	—	—
3SE5..4-0.....1AC5	3SY3 128	1 NO + 1 NC	—	21	22	13	14	PE	—	—	—	—
3SE5..4-0.....1AE0	3SY3 127	2 NC	—	21	22	31	32	—	—	—	—	—
3SE5..4-0.....1AE1	3SY3 128	2 NC	—	21	22	31	32	PE	—	—	—	—
3SE5..4-1C....1AF3	3SY3 128	1 NO + 1 NC snap action	2 LEDs	21	22	13 / LED gn	14 / LED ye	Ground LED	—	—	—	—
3SE5..4-1B....1AF3	3SY3 128	1 NO + 1 NC slow-action	2 LEDs	21	22	14 / LED gn	13 / LED ye	Ground LED	—	—	—	—
3SE5..4-1L....1AD4	3SY3 134	1 NO + 2 NC snap action	2 LEDs	21	22	13 / LED gn	14 / LED ye	31	32	Ground LED	PE	—
3SE5..4-1K....1AD4	3SY3 134	1 NO + 2 NC slow-action	2 LEDs	21	22	14 / LED gn	13 / LED ye	31	32	Ground LED	PE	—
Connector sockets, 6-pole + PE												
3SE5..5-0.....1AD0	3SY3 131	1 NO + 1 NC	—	21	22	13	14	—	—	—	—	✓
3SE5..5-0.....1AD1	3SY3 131	1 NO + 2 NC	—	21	22	13	14	31	32	—	—	✓
3SE5..5-C....1AF2	3SY3 131	1 NO + 1 NC snap action	2 LEDs	21	22	13 / LED gn	14 / LED ye	—	Ground LED	—	—	✓
3SE5..5-B....1AF2	3SY3 131	1 NO + 1 NC slow-action	2 LEDs	21	22	14 / LED gn	13 / LED ye	—	Ground LED	—	—	✓
3SE5..5-L....1AD2	3SY3 131	2 NC snap-action	2 LEDs	21	22	31	32	13 / LED gn	Ground LED	—	—	✓
3SE5..5-K....1AD2	3SY3 131	2 NC slow-action	2 LEDs	21	22	31	32	14 / LED gn	Ground LED	—	—	✓

gn Green
ye Yellow

✓ Connected
— Not available

Limit Switches

3SE03 North American Limit Switches

General Information

Features

Modular plug-in



Prewired receptacle with pin connector



Prewired cable



Features

- UL Listed, CSA Certified.
- UL File: E47512
- All Metal Captive Screws.
- Keyed, Four-Directional Head.
- Steel-Reinforced Diaphragm Seal Between Operational Head And Switch Body.
- Permanent Instructions for Adjusting Operational Head.
- Modular, Plug-In Housing
 1. Heavy-Duty, Bifurcated, Plug-In Prongs.
 2. Ample Receptacle Wiring Space with 1/2 - NPT threaded conduit opening.
 3. Stepped Terminals On Single Pole; Deep Center Trough On Double Pole.
- NEMA Type 6P Submersible
 1. Completely Sealed With Epoxy.
 2. SOOW-A Cable or Prewired Receptacle With Pin Connector.
 3. Factory wired cable features a 350 pound pullput capacity.
- Rotary heads are field convertible CW, CCW, or both without special tools.

Design

Modular Plug-In Housing

These heavy duty plug-in limit switches may be provided as complete devices using a composite catalog number; or, separately as components; operating head, plug-in module and base receptacle.

Example:

Complete Switch:

3SE03-AR1

Single Pole, Double Throw contacts with Side Rotary, Momentary Head

Components

3SE03-SA^①

Single Pole, Double Throw Plug-in Module

3SE03-DR1

Side Rotary Head, Momentary

3SE03-RA^①

Standard, Single Pole Receptacle, 1 NO + 1 NC

Since components may be interchanged, operating heads, plug-in modules and receptacles may be combined to satisfy most of your everyday limit switch requirements. This leads to less inventory with greater flexibility.

Operating heads include side rotary; plain and roller plunger; and, wobble. A variety of levers are available.

The zinc die-cast housing has an epoxy finish to protect against corrosion. All screws on the module and head are captive.

NEMA Type 6P Submersible

These heavy duty prewired, factory sealed switches meet the demanding enclosure requirements of UL (NEMA) Type 3, 4, 4X, 6P, 12, and 13. They are intended for wet environments where the integrity of the threaded conduit and switch body seals must be assured.

The switch body cavity including threaded conduit entry is completely sealed with epoxy. An 8 foot, 5 or 9 conductor SOOW-A cable; or 5 or 9 pin prewired receptacle with pin connector is provided as standard.

Switches are provided as complete devices using composite catalog numbers; or, separately as components; operating head and switch body.

UL (NEMA) Type 6P switches are designed to provide a degree of protection against the entry of water during prolonged submersion at limited depths (tested with a 6 foot head of water for 24 hours).

Both the Modular Plug-in and the (NEMA) Type 6P Submersible styles provide 60 Amp make and 6 Amp break—120V AC and 10 Amp continuous current for 120, 240, 480 and 600V AC. The circuit contact configuration depends on the device selected and the application criteria.

Switches are available with momentary or maintained operating heads; and, single pole, double pole or center neutral (modular, plug-in only) contact configurations.

3SE03 limit switches offer a new standard of reliability and quality in automatic control circuits under heavy duty applications.

^① Plug-in module and receptacle are keyed.

Limit Switches

3SE03 North American Limit Switches

Modular, plug-in and
NEMA type 6P submersible

1
2
3
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12
13

Technical data

Type	Modular, Plug-in and NEMA Type 6P Submersible					
Mechanical life	Side rotary: 13×10^6 make-break operations minimum					
Electrical life	All others: 10×10^6 make-break operations minimum Single Pole: 1×10^6 operations typical at full load Double Pole: 1×10^5 operations typical at full load					
Switching frequency Operating point accuracy	8 x 10 ³ make-break operations per hour (maximum) Side operated: 0.0012 in. (modular, plug-in housing) Side rotary: 0.0014 in. (modular plug-in). Top operated: 0.0003 in. (modular, plug-in housing)					
Cable entry	1/2 in.-NPT, Prewired Cable or Prewired Receptacle with Pin Connector					
Ambient temperature Degree of protection	Without Cable: -10° to +121°C, 14° to 250°F With Cable: -10° to +105°C, 14° to 221°F NEMA Type 1, 3, 3S, 4, 4X, 6, 6P, 13; IP67					
Conductor size Mounting Tightening Torque	22–12 AWG (modular, plug-in housing), single or stranded wire 5 or 9 conductor, 16 AWG yellow jacketed type SOOW-A cable (prewired cable) 5 or 9 pin, 0.87 in. (22 mm) diameter receptacle (prewired receptacle with pin connector) Any position Switch body screws: 25–30 lb-in. Operating head screws: 14–18 lb-in.					
NEMA rating	DC, NEMA R300		AC, NEMA A600			
Maximum current at	125V	250V	120V	240V	480V	600V
Make Break	0.22A 0.22A	0.11A 0.11A	60A 6A	30A 3A	15A 1.5A	12A 1.2A
Max. volt-ampere Make Break	28VA 28VA	28VA 28VA	7200VA 720VA	7200VA 720VA	7200VA 720VA	7200VA 720VA
Rated thermal current Rated operating voltage	DC, 1A DC, 300V		AC, 10A AC, 600V			

Operating temperature ¹⁾ ²⁾

Temperature rating	Operation		Temperature range	
	Type	Return	Without cable	With cable
1	Side rotary ³⁾	Momentary CW only or CCW only	10°F to 200°F -12°C to 94°C	10°F to 200°F -12°C to 94°C
2	Center neutral Side rotary Side plunger Two-sided plunger Roller side plunger ⁴⁾	Momentary CW or CCW Maintained Momentary Maintained Momentary	14°F to 200°F -10°C to 94°C	14°F to 200°F -10°C to 94°C
3	Top plunger Top roller plunger ⁴⁾ Wobble head	Momentary Momentary Momentary	14°F to 250°F -10°C to 121°C	14°F to 221°F -10°C to 105°C

1) Temperature ranges below +32°F (0°C) are based on absence of freezing moisture or water.

2) For temperature rating of specific switch, refer to page 13/70, Operating Heads.

3) For CW only or CCW only operation, upper temperature limit increases to 250°F (121°C) without cable, and 221°F (105°C) with pre-wired cable.




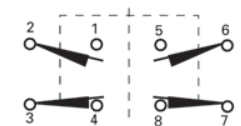







4) Roller direction can be converted in the field.



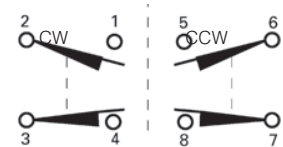

Limit Switches

3SE03 North American Limit Switches

Modular, plug-in metal housing

Complete switches without lever - threaded cable entry:

 Plug-In module type		Standard single pole 1 NO + 1 NC (3SE03-SA)			Standard double pole 2 NO + 2 NC (3SE03-SB)		
 Receptacle type surface mount		Single pole (3SE03-RA) 			Double pole (3SE03-RB) 		
Operating head type		Composite catalog number consisting of head, module and receptacle					
		DT	Catalog Number	List Price \$ 1 unit	DT	Catalog Number	List Price \$ 1 unit
 Side rotary CW and CCW operation convertible to CW only or CCW only	Standard momentary (3SE03-DR1)	▶	3SE03-AR1 ①		▶	3SE03-BR1 ①	
	Standard maintained (3SE03-DM1)	▶	3SE03-AM1		▶	3SE03-BM1	
	Low torqued momentary (3SE03-DL1)	▶	3SE03-AL1 ②			3SE03-BL1 ②	
 Plain side plunger	Momentary (3SE03-DS1)	▶	3SE03-AS1		▶	3SE03-BS1	
 Roller side plunger	Momentary (3SE03-DS3)	▶	3SE03-AS3			3SE03-BS3	
 Two-sided plunger	Maintained (3SE03-DH1)		3SE03-AH1			3SE03-BH1	
 Plain top plunger	Momentary (3SE03-DT1)	▶	3SE03-AT1			3SE03-BT1	
 Roller top plunger	Momentary (3SE03-DT3)		3SE03-AT3		▶	3SE03-BT3	
 Wobble head (without lever)	Momentary (3SE03-DW1)	▶	3SE03-AW1		▶	3SE03-BW1	

			Plug-In module type			Center neutral Double pole 2 NO + 2 NC (3SE03-SN)		
			Receptacle type surface mount			Center neutral (3SE03-RB) 		
Operating head type						Composite catalog number consisting of head, module and receptacle		
						DT	Catalog Number	List Price \$ 1 unit
	Side rotary (momentary)	Center	(3SE03-DN1)	▶	3SE03-NN1①			
		Neutral	(3SE03-DN2)	▶	3SE03-NN2②			

① 5° pretravel to operate contacts.



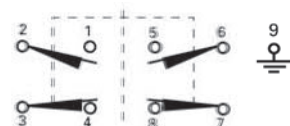
② 15° pretravel to operate contacts.








Limit Switches

3SE03 North American Limit Switches

NEMA type 6P submersible, prewired cable

Complete switches without lever - prewired cable:

 <p>Switch body type—prewired cable with 8 foot cable</p>	<p>Single pole 1 NO + 1 NC (3SE03-SA6P)</p> <p>Cable color code 1 - White 2 - Black 3 - Red 4 - Orange 5 - Green</p> 	<p>Double pole 2 NO + 2 NC (3SE03-SB6P)</p> <p>Cable color code 1 - White 6 - Pink 2 - Black 7 - Yellow 3 - Red 8 - Blue 4 - Orange 9 - Green 5 - Brown</p> 
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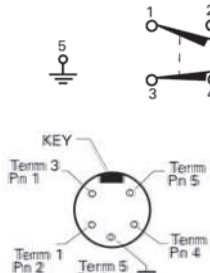
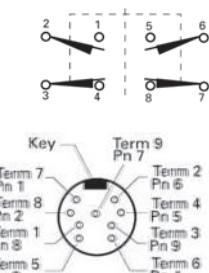
Operating head type		Composite catalog number consisting of head and switch body				
		DT	Catalog Number	List Price \$ 1 unit	Catalog Number	List Price \$ 1 unit
 <p>Side rotary CW and CCW operation convertible to CW only or CCW only</p>	Standard momentary (3SE03-DR1)	▶	3SE03-AR16P		3SE03-BR16P	
	Standard maintained (3SE03-DM1)		3SE03-AM16P		3SE03-BM16P	
	Low torqued momentary (3SE03-DL1)		3SE03-AL16P		3SE03-BL16P	
 <p>Plain side plunger</p>	Momentary (3SE03-DS1)		3SE03-AS16P		3SE03-BS16P	
 <p>Roller side plunger</p>	Momentary (3SE03-DS3)		3SE03-AS36P		3SE03-BS36P	
 <p>Two-sided plunger</p>	Maintained (3SE03-DH1)		3SE03-AH16P		Not available	
 <p>Plain top plunger</p>	Momentary (3SE03-DT1)		3SE03-AT16P		3SE03-BT16P	
 <p>Roller top plunger</p>	Momentary (3SE03-DT3)		3SE03-AT36P		3SE03-BT36P	
 <p>Wobble head (without lever)</p>	Momentary (3SE03-DW1)		3SE03-AW16P		3SE03-BW16P	








Limit Switches

3SE03 North American Limit Switches

**NEMA type 6P submersible,
prewired receptacle**

Complete switches without lever - prewired receptacle with pin connector:

 <p>Switch Body Type—prewired receptacle with pin connector</p>	<p>Single pole 1 NO + 1 NC (3SE03-SA6PC)</p> 	<p>Double pole 2 NO + 2 NC (3SE03-SB6PC)</p> 
--	---	--



Operating head type		Composite catalog number consisting of head and switch body				
		DT	Catalog Number	List Price \$ 1 unit	Catalog Number	List Price \$ 1 unit
 Side rotary CW and CCW operation convertible to CW only or CCW only	Standard momentary (3SE03-DR1)	▶	3SE03-AR16PC		3SE03-BR16PC	
	Standard maintained (3SE03-DM1)		3SE03-AM16PC		3SE03-BM16PC	
	Low torqued momentary (3SE03-DL1)		3SE03-AL16PC		3SE03-BL16PC	
 Plain side plunger	Momentary (3SE03-DS1)		3SE03-AS16PC		3SE03-BS16PC	
 Roller side plunger	Momentary (3SE03-DS3)		3SE03-AS36PC		3SE03-BS36PC	
 Two-sided plunger	Maintained (3SE03-DH1)		3SE03-AH16PC		Not available	
 Plain top plunger	Momentary (3SE03-DT1)		3SE03-AT16PC		3SE03-BT16PC	
 Roller top plunger	Momentary (3SE03-DT3)		3SE03-AT36PC		3SE03-BT36PC	
 Wobble head (without lever)	Momentary (3SE03-DW1)		3SE03-AW16PC		3SE03-BW16PC	

Limit Switches



3SE03 North American Limit Switches

Modular, plug-in and
NEMA type 6P submersible











Components:

 Plug-in module	Plug-in module		DT	Catalog Number	List Price \$ 1 unit
	Standard single pole 1 NO + 1 NC		▶	3SE03-SA	
	Standard double pole 2 NO + 2 NC		▶	3SE03-SB	
	Center neutral 2 NO + 2 NC ^①		▶	3SE03-SN	
 Receptacle	Receptacle for plug-in module			Catalog Number	List Price \$ 1 unit
	Single pole 1 NO + 1 NC (5 terminals)		▶	3SE03-RA	
	Single pole 2 NO + 2 NC (9 terminals)			3SE03-RB	

Switch body—NEMA type 6P submersible:

 Prewired cable	Prewired cable 8 foot length				Prewired receptacle with pin connector		
	Switch body	DT	Catalog Number	List Price \$ 1 unit	DT	Catalog Number	List Price \$ 1 unit
	Single pole 1 NO + 1 NC	▶	3SE03-SA6P			—	—
	Single pole 2 NO + 2 NC	▶	3SE03-SB6P			—	—
 Prewired receptacle	Single pole 1 NO + 1 NC		—	—	▶	3SE03-SA6PC	
	Single pole 2 NO + 2 NC		—	—	▶	3SE03-SB6PC	

Operating heads^②:

 		Nominal operating data								
Operating head type		Total travel	Pretravel	Operating force	Release position	Minimum return force	Operating temp range ^④	DT	Catalog Number	List Price \$ 1 unit
 Side rotary^⑤	Standard momentary ^⑥	90°	5°	3 lb-in.	2°	4.5 oz-in.	1	▶	3SE03-DR1	
	Low torqued momentary ^⑥	90°	15°	1.5 lb-in.	6°	2.5 oz-in.	1	▶	3SE03-DL1	
	Standard maintained	90°	50°	3 lb-in.	50°	—	2	▶	3SE03-DM1	
 Plain side plunger	Momentary	0.25 in.	0.065 in.	4 lbs	0.03 in.	8 oz.	2	▶	3SE03-DS1	
 Roller side plunger	Momentary ^⑦	0.25 in.	0.065 in.	4 lbs	0.03 in.	8 oz.	2	▶	3SE03-DS3	
 Two-sided plunger	Maintained	0.32 in.	0.2 in.	5 lbs	0.13 in.	5 lbs	2	▶	3SE03-DH1	
 Plain top plunger	Momentary	0.28 in.	0.04 in.	4 lbs	0.02 in.	8 oz.	3	▶	3SE03-DT1	
 Roller top plunger	Momentary	0.28 in.	0.04 in.	4 lbs	0.02 in.	8 oz.	3	▶	3SE03-DT3	
 Wobble head^{⑧⑨}	Momentary	15°	10°	2 lb-in.	6°	2.4 oz-in.	3	▶	3SE03-DW1	
 Center neutral^⑨	Momentary	90°	5°	1.8 lb-in.	2°	2.5 oz-in.	2	▶	3SE03-DN1	
		90°	15°	1.8 lb-in.	2°	2.5 oz-in.	2	▶	3SE03-DN2	

① For use with 3SE03-DN1, -DN2 operating heads and 3SE03-RB receptacle only.

② For use with modular, Plug-in and NEMA Type 6P.

③

④ Refer to "Operating Temperature", Catalog page 13/118 for Temperature Ranges.

⑤ Without Operating Levers.

⑥ CW and CCW operation. Convertible to CW or CCW operation only.

⑦ Convertible—Horizontal to Vertical.

⑧ Requires Lever.

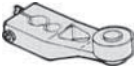




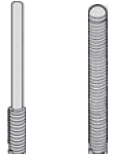
⑨ For use with 3SE03-SN plug-in module only.

Limit Switches


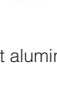
3SE03 North American Limit Switches

Modular, plug-in metal housing

Levers for plug-in and non-plug-in versions—most widely used

Description	Length ^①	Roller mounted on side of lever	Roller material	Roller diameter	Roller face width	Max required ^② return torque (oz-in.)	DT	Catalog Number	List Price \$ 1 unit
	1.5 (38)	Front	Nylatron	0.75 (19)	0.31 (8)	0.53	▶	3SX03-KL200	
	1.5 (38)	Front	Cast aluminum	0.75 (19)	0.31 (8)	1.10	▶	3SX03-KL355	
	1.5 (38)	Back	Cast aluminum	0.75 (19)	0.31 (8)	1.10	▶	3SX03-KL579	
	1.5 (38)	Back / back	Nylatron	0.75 (19)	0.31	–	▶	3SX03-KL204	
	1–3.5 (25–89)	Front	Nylatron	0.75 (19)	0.31 (8)	1.90 ^⑤	▶	3SX03-KL201	
	1–3.5 (25–89)	Front	Metal	0.75 (19)	0.31 (8)	3.40 ^⑤	▶	3SX03-KL538	
	9 (229)	–	Stainless steel	–	–	7.00 ^⑤	▶	3SX03-KL220	
	Adjustable spring rod	–	Nylon	–	–	3.50 ^⑤	▶	3SX03-KL556	
	6 (152)	–	Nylatron	–	–	0.40	▶	3SX03-KL142	
Levers									
	Rod	–	Nylon	–	–	–	▶	3SX03-KW2	
	Coil spring	–	Coil spring	–	–	–	▶	3SX03-KW4	
	For plunger actuated switches wobble actuators ^⑥								

Levers for plug-in and non-plug-in versions:

Operator	Length ^①	Roller			Max required ^② return torque (oz-in.)	Catalog Number			List Price \$ 1 unit
		Type	Diameter	Face (width)		Stainless steel	DT	Cast aluminum	
	0.87 (22)	Metal	0.75 (19)	0.31 (8)	0.62	–		3SX03-KL39	
	1.37 (35)	Metal	0.75 (19)	0.31 (8)	0.95	–	▶	3SX03-KL40	
	1.50 (38)	Nylatron	0.75 (19)	1.00 (25)	0.92	–	▶	3SX03-KL337	
		Ball bearing	0.69 (17)	0.25 (6)	0.77	–		3SX03-KL531	
		Without roller	–	–	0.32	–		3SX03-KL32	
	2.00 (51)	Nylatron	0.75 (19)	0.31 (8)	0.71	–	▶	3SX03-KL546	
		Nylatron	0.75 (19)	1.00 (25)	1.45	–		3SX03-KL572	
		Metal	0.75 (19)	0.31 (8)	1.5	–	▶	3SX03-KL549	
	250 (64)	Ball bearing	0.69 (17)	0.25 (6)	1.1	–		3SX03-KL552	
		Nylatron	0.75 (19)	0.31 (8)	1.0	–		3SX03-KL547	
	3.00 (76)	Nylatron	0.75 (19)	1.00 (25)	1.8	–		3SX03-KL573	
		Nylatron	1.5 (38)	0.28 (7)	1.4	–		3SX03-KL575	
		Metal	0.75 (19)	0.31 (8)	2.0	–		3SX03-KL550	
		Ball bearing	0.69 (17)	0.25 (6)	1.5	–	▶	3SX03-KL553	
		Nylatron	0.75 (19)	0.31 (8)	1.3	–	▶	3SX03-KL548	
		Nylatron	0.75 (19)	1.00 (25)	2.3	–	▶	3SX03-KL574	
		Nylatron	1.5 (38)	0.28 (7)	1.8	–	▶	3SX03-KL576	
		Metal	0.75 (19)	0.31 (8)	2.5	–	▶	3SX03-KL551	
		Ball bearing	0.69 (17)	0.25 (6)	1.8	–		3SX03-KL554	

All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

- ① Roller lever: Length from the operating shaft axis to the roller axis.
All other: Length from the operating shaft axis to the tip.

② Caution—When selecting lever, required return torque should not exceed minimum return torque in operating head.

③ Cap screw accommodates 3/64 inch Allen wrench.

④ By re-assembling lever minimum can be reduced another 0.50 (13).

⑤ Applies when lever extended to maximum dimension.








⑥ See dimensions page 13/76.

Limit Switches





3SE03 North American Limit Switches

Modular, plug-in and
NEMA type 6P submersible

Levers for plug-in and non-plug-in versions—most widely used

Operator		Length ^① Inches (mm)	Roller			Min. required return torque oz-in ^⑤	Catalog Number			
			Type	Diameter In. (mm)	Face width in. (mm)		DT	Stainless steel	Cast aluminum	List Price \$ 1 unit
Roller levers										
	Roller on reverse side	1.50 (38)	Nylatron Nylatron Ball bearing	0.75 (19) 1.5 (38) 0.69 (17)	0.31 (8) 0.28 (7) 0.25 (6)	0.53 0.96 0.77	▶ — —	— — —	3SX03-KL310 3SX03-KL536 3SX03-KL580	
	Offset lever (Inboard roller shown)	1.50 (38) Inboard roller	Nylatron	0.75 (19)	0.31 (8)	0.65	▶	3SX03-KL24	—	
			Metal	0.75 (19)	0.31 (8)	1.20	▶	3SX03-KL25	—	
			Ball bearing	0.69 (17)	0.25 (6)	0.90	—	3SX03-KL26	—	
		1.50 (38) outboard roller	Nylatron	0.75 (19)	0.31 (8)	0.65	▶	3SX03-KL27	—	
			Metal	0.75 (19)	0.31 (8)	1.20		3SX03-KL28	—	
			Ball bearing	0.69 (17)	0.25 (6)	0.90		3SX03-KL29	—	
	Bantam lever	0.69 (18)	Metal	0.88 (22)	0.19 (5)	0.45	▶	3SX03-KL532		
	Precision adjustment	1.50 (38) ^②	Nylatron	0.75 (19)	0.31 (8)	0.65	▶	3SX03-KL340		
			Metal	0.75 (19)	0.31 (8)	1.20		3SX03-KL465		
			Ball bearing	0.69 (17)	0.25 (6)	0.90		3SX03-KL535		
	Adjustable roller	1–3.75 (25–95) ^③ 1–3.75 (25–95) ^③ 1.62–3.75 (41–95) ^③ 0.50–3.75 (13–95) 1–3.75 (25–95) ^③ 0.50–3.75 (13–95)	Nylatron	0.75 (19)	0.5 (13)	1.90 ^④	▶ ▶ ▶	3SX03-KL599		
			Nylatron	0.75 (19)	1 (25)	3.10 ^④		3SX03-KL537		
			Nylatron	1.5 (38)	0.28 (7)	2.50 ^④		3SX03-KL443		
			Large nylatron	4 (102)	0.11 (3)	4.50 ^④		3SX03-KL598		
			Ball bearing	0.69 (17)	0.25 (6)	2.50 ^④		3SX03-KL539		
			Without roller	—	—	1.20 ^④		3SX03-KL31		
	Fork lever _ both rollers one side	1.50 (38)	Nylatron	0.75 (19)	1 (25)	—	▶ ▶	3SX03-KL543		
			Metal	0.75 (19)	0.31 (8)	—		3SX03-KL544		
			Ball bearing	0.69 (17)	0.25 (6)	—		3SX03-KL545		
	Fork lever _ both rollers outside, one side	1.50 (38)	Nylatron	0.75 (19)	0.31 (8)	—	▶	3SX03-KL203		
			Metal	0.75 (19)	0.31 (8)	—		3SX03-KL541		
			Ball bearing	0.69 (17)	0.25 (6)	—		3SX03-KL542		

Levers for plug-in and non-plug-in versions:

Operator	Length ^① Inches (mm)	Description Inches (mm)	Min. required return force oz-in. ^⑤	DT	Catalog Number	List Price \$ 1 unit
	Adjustable rod	5.50 (140) Max.	Nylon Rod—0.19 (5) Dia.	0.40 ^④	▶	3SX03-KL399
		5.50 (140) Max.	Metal Rod—0.12 (3) Dia.	0.92 ^④	▶	3SX03-KL202
		8.75 (222) Max.	Metal Rod (Square)—0.12 (3) Max.	2.20 ^④	▶	3SX03-KL581
		12 (305) Max.	Steel (Formable) Rod—0.12 (3) Dia.	5.00 ^④	▶	3SX03-KL226
		—	Clamp Only—0.19 (5) Hole	—	▶	3SX03-KL35
		—	Clamp Only—0.12 (3) Hole	—	▶	3SX03-KL36
	Spring rod	11.62 (295)	Metal rod	2.80		3SX03-KL421
	Adjustable wire	12.12 (308) max.	Nylon covered wire	1.50 ^④	▶	3SX03-KL533
	Adjustable wide roller lever	3.9 (99)	0.75 (19) Dia. Nylatron Roller 0.19 (30) Dia. Rod	4.50 ^④	▶	3SX03-KL37
Wobble head operators						
See dimensions page 13/76	Stainless steel rod	—	Rod diameter - 0.06 (2)	—	▶	3SX03-KW3

① Length from operating shaft axis to the roller axis.

② Maximum dimensions, precision adjustable to lesser dimensions.

③ By re-assembling lever minimum can be reduced by 1/2 in.

④ Applies when lever extended to maximum dimension.

⑤ Caution—When selecting lever, required return torque should not exceed minimum return force in operating head.

All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

Limit Switches

3SE03 North American Limit Switches

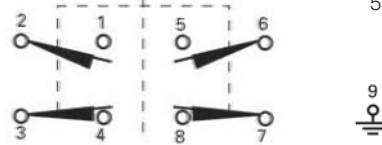
Modular, plug-in and
NEMA type 6P submersible

Wiring diagrams

Single Pole
1 NO - 1 NC

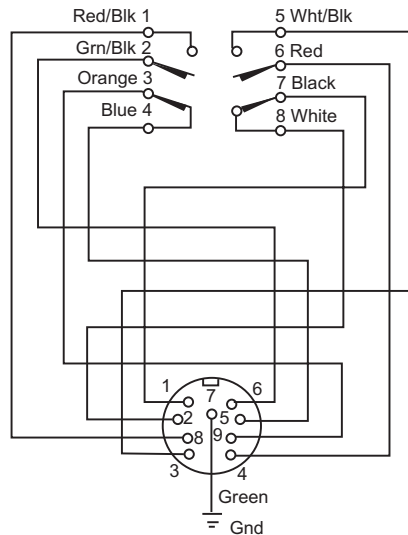
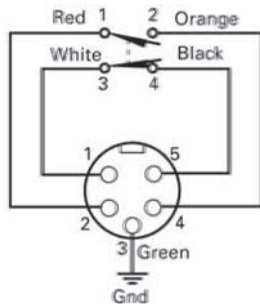


Double Pole
1 NO - 1 NC



Cable color code
1 - White 6 - Pink
2 - Black 7 - Yellow
3 - Red 8 - Blue
4 - Orange 9 - Green
5 - Brown
Pre-wired cable

Modular, plug-in and prewired cable



Prewired receptacle with pin connector

Typical connector cable (supplied by user)

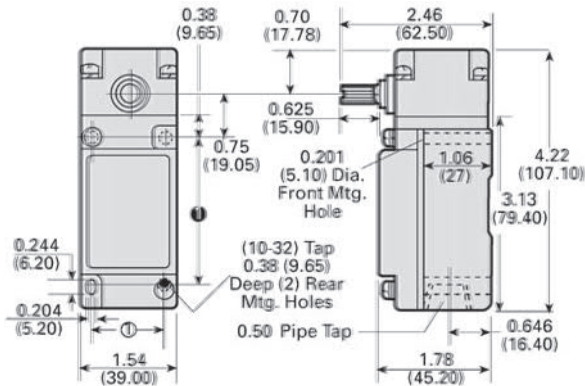
Cable length ft.	Manufacturers part number			
	Daniel Woodhead Brad Harrison	Cooper Crouse-Hinds	Molex (Industrial Interface)	Lumberg USA
5 Pin connector cable				
3	105000A01F030	5000111-3_	14541	RK50-77/1M
6	105000A01F060	5000111-4_	14542	RK50-77/2M
12	105000A01F120	5000111-5_	14544	RK50-77/4M
9 Pin connector cable				
3	309000A01F030	X8990-3	—	—
6	309000A01F060	X8990-4	—	—
12	309000A01F120	X8990-5	—	—

Limit Switches

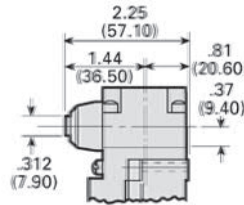
3SE03 North American Limit Switches

Modular, plug-in and
NEMA type 6P submersible

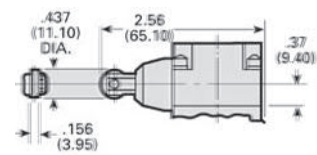
Dimension drawings



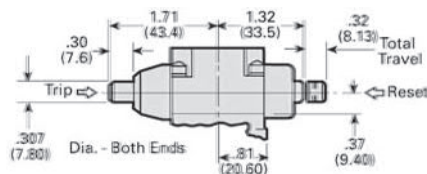
Plain side plunger



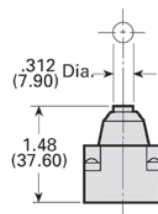
Roller side plunger



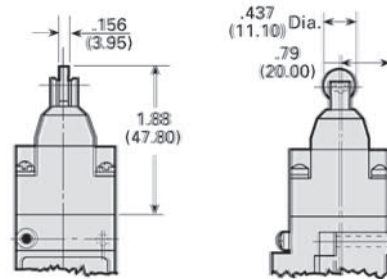
Two side plungers



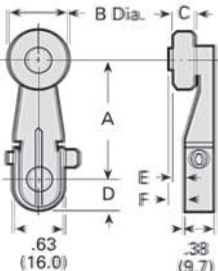
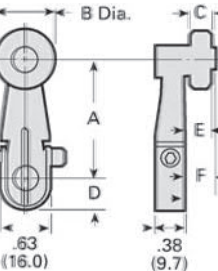
Plain top plunger



Roller top plunger



Rotary lever operators

	Catalog Number	Dimensions						Catalog Number	Dimensions					
		A	B	C	D	E	F		A	B	C	D	E	F
	3SX03-KL200	1.50 (38.1)	0.75 (19.0)	0.32 (8.1)	0.44 (11.2)	0.20 (5.1)	0.24 (6.1)	3SX03-KL554	3.00 (76.2)	0.688 (17.5)	0.25 (6.4)	0.42 (10.7)	0.12 (3.0)	0.18 (4.6)
	3SX03-KL355	1.50 (38.1)	0.75 (19.0)	0.32 (8.1)	0.44 (11.2)	0.20 (5.1)	0.24 (6.1)	3SX03-KL572	2.00 (50.8)	0.75 (19.0)	1.00 (25.4)	0.42 (10.7)	0.90 (22.9)	0.90 (22.9)
	3SX03-KL377	1.50 (38.1)	0.75 (19.0)	1.00 (25.4)	0.44 (11.2)	0.90 (22.9)	0.90 (22.9)	3SX03-KL573	2.50 (63.5)	0.75 (19.0)	1.00 (25.4)	0.42 (10.7)	0.90 (22.9)	0.90 (22.9)
	3SX03-KL531	1.50 (38.1)	0.688 (17.5)	0.25 (6.4)	0.44 (11.2)	0.12 (3.0)	0.18 (4.6)	3SX03-KL574	3.00 (76.2)	0.75 (19.0)	1.00 (25.4)	0.42 (10.7)	0.90 (22.9)	0.90 (22.9)
	3SX03-KL546	2.00 (50.8)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	3SX03-KL575	2.50 (63.5)	1.50 (38.1)	0.29 (7.4)	0.42 (10.7)	0.18 (4.6)	0.24 (6.1)
	3SX03-KL547	2.50 (63.5)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	3SX03-KL576	3.00 (76.2)	1.50 (38.1)	0.29 (7.4)	0.42 (10.7)	0.18 (4.6)	0.24 (6.1)
	3SX03-KL548	3.00 (76.2)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	With rollers on reverse side						
	3SX03-KL549	2.00 (50.8)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	3SX03-KL310	1.50 (38.1)	0.75 (19.0)	0.32 (8.1)	0.44 (11.2)	0.34 (8.6)	0.38 (9.7)
	3SX03-KL550	2.50 (63.5)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	3SX03-KL536	1.50 (38.1)	1.50 (38.1)	0.28 (7.1)	0.44 (11.2)	0.30 (7.6)	0.38 (9.7)
	3SX03-KL551	3.00 (76.2)	0.75 (19.0)	0.32 (8.1)	0.42 (10.7)	0.20 (5.1)	0.24 (6.1)	3SX03-KL579	1.50 (38.1)	0.75 (19.0)	0.32 (8.1)	0.44 (11.2)	0.34 (8.6)	0.38 (9.7)
	3SX03-KL552	2.00 (50.8)	0.688 (17.5)	0.25 (6.4)	0.42 (10.7)	0.12 (3.0)	0.18 (4.6)	3SX03-KL580	1.50 (38.1)	0.688 (17.5)	0.25 (6.4)	0.44 (11.2)	0.25 (6.4)	0.31 (7.9)
	3SX03-KL553	2.50 (63.5)	0.688 (17.5)	0.25 (6.4)	0.42 (10.7)	0.12 (3.0)	0.18 (4.6)							

All dimensions shown in inches and (millimeters). For reference purpose only. Not to be used for design or construction purposes.

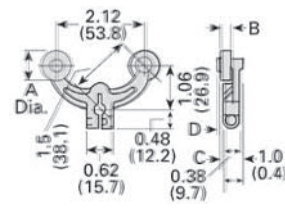
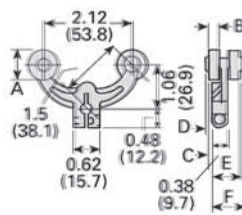
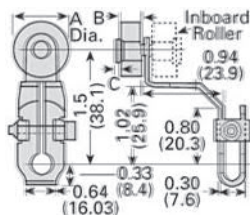
① Can accommodate both U.S. 1.16 (29.4) x 2.34 (59.5) and DIN 1.18 (30.0) x 2.36 (60.0) mounting dimensions.

Limit Switches

3SE03 North American Limit Switches

Modular, plug-in and
NEMA type 6P submersible

Dimension drawings



Offset roller levers

Catalog Number	Dimensions		
	A	B	C
Outboard roller			
3SX03-KL27	0.75 (19)	0.32 (8)	0.03 (1)
3SX03-KL28	0.75 (19)	0.32 (8)	0.03 (1)
3SX03-KL29	0.69 (18)	0.25 (6)	0.04 (1)
3SX03-KL30	0.75 (19)	1.0 (25)	—
Inboard roller			
3SX03-KL24	0.75 (19)	0.32 (8)	0.03 (1)
3SX03-KL25	0.75 (19)	0.32 (8)	0.03 (1)
3SX03-KL26	0.69 (18)	0.25 (6)	0.04 (1)

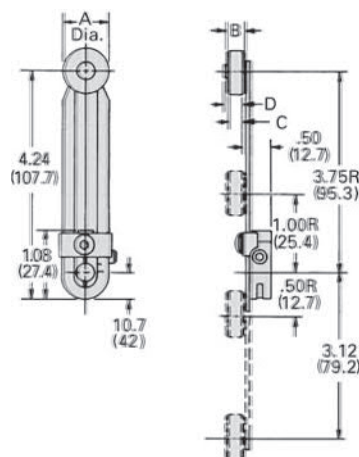
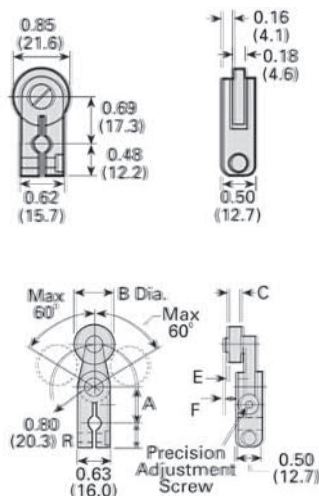
Fork lever, one roller inside, one roller outside

Catalog Number	Dimensions					
	A	B	C	D	E	F
3SX03-KL203	0.75 (19)	0.32 (8)	0.16 (4)	0.20 (5)	0.73 (19)	0.77 (20)
3SX03-KL541	0.75 (19)	0.32 (8)	0.16 (4)	0.20 (5)	0.73 (19)	0.77 (20)
3SX03-KL542	0.69 (18)	0.25 (6)	0.08 (2)	0.14 (4)	0.64 (16)	0.70 (18)

Fork lever - Both rollers on one side

Catalog Number	Dimensions			
	A	B	C	D
3SX03-KL204	0.75 (19)	0.32 (8)	0.16 (4)	0.20 (5)
3SX03-KL543	0.75 (19)	1.0 (25)	0.86 (22)	0.86 (22)
3SX03-KL544	0.75 (19)	0.32 (8)	0.16 (4)	0.20 (5)
3SX03-KL545	0.69 (18)	0.25 (6)	0.08 (2)	0.1 (3)

Bantam roller lever



Precision adjustment roller lever

Catalog Number	Dimensions					
	A	B	C	D	E	F
3SX03-KL340	0.69 (18)	0.75 (19)	0.32 (8)	0.48 (12)	0.24 (6)	0.28 (7)
3SX03-KL465	0.69 (18)	0.75 (19)	0.32 (8)	0.48 (12)	0.24 (6)	0.28 (7)
3SX03-KL535	0.69 (18)	0.69 (18)	0.25 (6)	0.48 (12)	0.16 (4)	0.22 (6)

Adjustable roller lever

Catalog Number	Dimensions			
	A	B	C	D
3SX03-KL201	0.75 (19)	0.32 (8)	0.29 (7)	0.33 (8)
3SX03-KL443	1.5 (38)	0.29 (7)	0.26 (7)	0.32 (8)
3SX03-KL537	0.75 (19)	0.32 (8)	0.29 (7)	0.33 (8)
3SX03-KL538	0.69 (18)	0.25 (6)	0.21 (5)	0.27 (7)
3SX03-KL539	0.69 (18)	0.25 (6)	0.21 (5)	0.27 (7)
3SX03-KL598	0.39 (10)	0.11 (3)	0.11 (3)	0.19 (5)
3SX03-KL599	0.75 (19)	0.5 (13)	0.46 (12)	0.47 (12)

All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

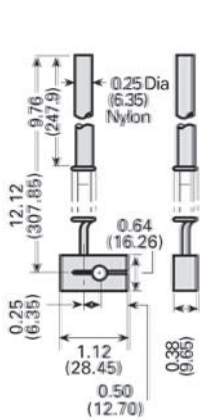
Limit Switches

3SE03 North American Limit Switches

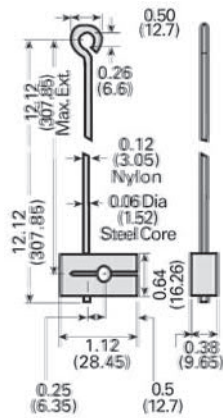
Modular, plug-in and
NEMA type 6P submersible

Dimension drawings

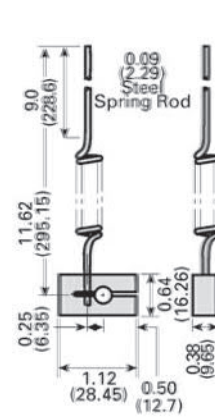
Nylon Spring Rod Actuator
3SX03-KL556



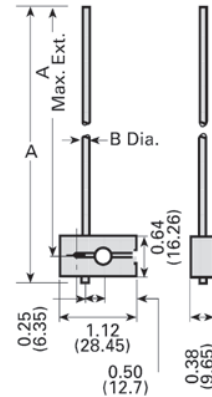
Nylon Covered Wire Actuator
3SX03-KL533



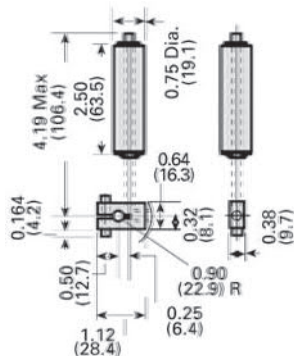
Stainless Steel Spring Actuator
3SX03-KL421



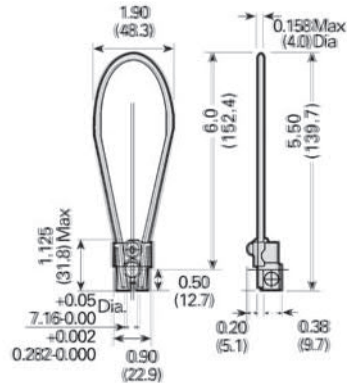
Adjustable Rod Actuator



Adjustable Wire Roller Actuator
3SX03-KL37



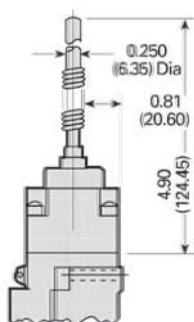
Nylatron Loop Actuator
3SX03-KL142



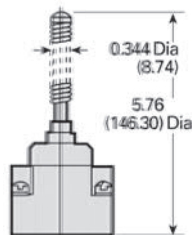
Adjustable rod actuators

Catalog Number	Material	Dimensions	
		A	B
3SX03-KL202	Steel-Round	5.50 (140)	0.120 (3)
3SX03-KL581	Steel-Square	8.75 (222)	0.125 (3)
3SX03-KL399	Nylon	5.50 (140)	0.190 (5)
3SX03-KL220	Stainless Steel	9.00 (229)	0.190 (5)
3SX03-KL226	Plated Steel	12.0 (305)	0.120 (3)

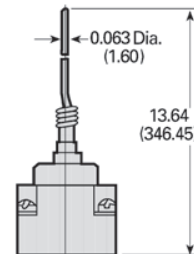
Wobble head with nylon head
3SE03-DW1
3SX03-KW2



Wobble head with coil spring
3SE03-DW1
3SX03-KW4



Wobble head with stainless steel rod
3SE03-DW1
3SX03-KW3



All dimensions shown in inches and (millimeters). For reference purposes only. Not to be used for design or construction purposes.

Limit Switches

3SE03 North American Limit Switches

3SE03 Metal enclosure

Description

Features

- NEMA 1 Enclosed Aluminum Die Cast Housing
- Screw Terminals
- Booted versions for added protection
- 1/2" Conduit Entrance
- NEMA A600, R300 Contacts
- UL Recognized
- CSA Certified
- INO/INC Snap-action contacts (form c)

Application

These switches are designed for accurate repeatability. Their compact size makes them ideal for use in space-restricted areas.

Typical applications include overhead, folding and elevator doors, sliding gates and other automated equipment.

Overall dimensions

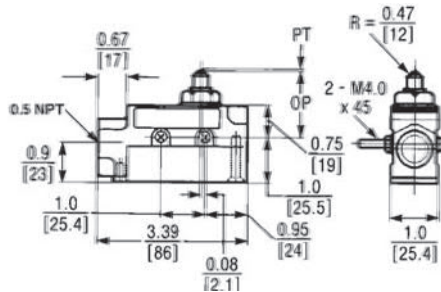
Specifications ①

DT

Catalog Number

List Price \$ 1 unit

Plunger actuator

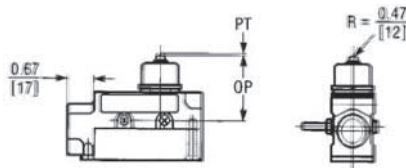


OF Max. - 8.82 - 12.3 oz.
(250 - 350 g)
RF Min. 4.02 oz. (114 g)
PT Max. - 0.016 in. (0.4 mm)
OT Min. - 0.217 in. (5.5 mm)
MD Max. - 0.002 in. (0.05 mm)
OP - 1.504 in. (38.2 mm)



3SE03 - EB05

Booted plunger

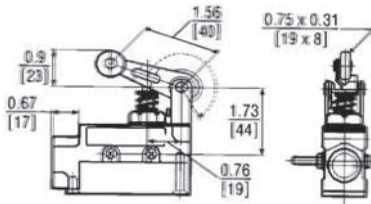


OF Max. - 28.22 oz. (800 g)
RF Min. 8.46 oz. (240 g)
PT Max. - 0.079 in. (2.0 mm)
OT Min. - 0.197 in. (5.0 mm)
MD Max. - 0.004 in. (0.1 mm)
OP - 1.803 in. (45.8 mm)



3SE03 - EB06

Roller lever

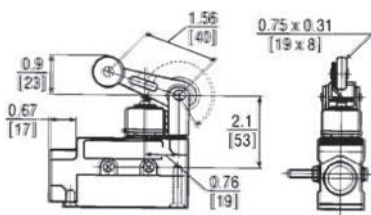


OF Max. - 20.1 oz. (570 g)
RF Min. 6.0 oz. (170 g)
PT Max. - 0.157 in. (4.0 mm)
OT Min. - 0.236 in. (6.0 mm)
MD Max. - 0.016 in. (0.4 mm)



3SE03 - EB32

Booted roller lever



OF Max. - 22.57 oz. (640 g)
RF Min. 8.11 oz. (230 g)
PT Max. - 0.197 in. (5.0 mm)
OT Min. - 0.236 in. (6.0 mm)
MD Max. - 0.016 in. (0.4 mm)



3SE03 - EB33

① OF = Operating Force
RF = Return Force
PT = Pretravel
OT = Operating Travel
MD = Movement Differential
OP = Operating Position

Limit Switches

3SE03 North American Limit Switches

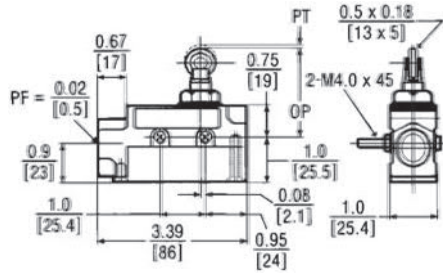
3SE03 Metal enclosure

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Dimension drawings

Overall dimensions

Roller plunger

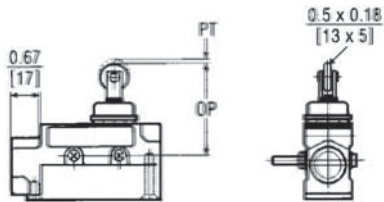


OF Max. - 9.92 - 12.3 oz.
(250 - 350 g)
RF Min. 4.02 oz. (114 g)
PT Max. - 0.02 in. (0.5 mm)
OT Min. - 0.142 in. (3.6 mm)
MD Max. - 0.002 in. (0.05 mm)
OP - 1.957 in. (49.7 mm)



3SE03 - EB07

Booted roller plunger



OF Max. - 17.64 oz. (500 g)
RF Min. 3.53 oz. (100 g)
PT Max. - 0.039 in. (1.0 mm)
OT Min. - 0.138 in. (3.5 mm)
MD Max. - 0.006 in. (0.12 mm)
OP - 1.957 in. (49.7 mm)



3SE03 - EB08

Technical data

Mechanical Life	3,000,000 operations maximum							
Electrical Life	500,000 operations minimum							
Operating Speed	0.01 m/second to 1m/second							
Cable Entry	1/2" NPT							
Temperature Range	-15° to 80° (5° to 176°F)							
Degree of Protection	NEMA 1							
Mounting	Any Position							
NEMA Rating	A600, R300							
Rated Voltage (V) ¹⁾²⁾	Non-Inductive Load (A)			Inductive load (A)			Inrush current (A)	
	Resistive load	Lamp load		Inductive load	Motor load			
		NC-NO	NO	NC	NC-NO	NO	NC	NO
125 VAC	15	3	1.5	15	5	2.5	30 maximum	15 maximum
250 VAC	15	2.5	1.25	15	3	1.5		
500 VAC	3	1.5	0.75	2.5	1.5	0.75		
8 VDC	15	3	1.5	15	5	2.5		
14 VDC	15	3	1.5	10	5	2.5		
30 VDC	6 (2)	3	1.5	5	5	2.5		
125 VDC	0.4	0.4	0.4	0.05	0.05	0.05		
250 VDC	0.2	0.2	0.2	0.03	0.03	0.03		

1) Inductive load has power factor of 0.04 minimum (AC) and a time of 7m/second (DC)

2) Lamp load has an inrush current of 6 times steady-state current.

Mechanical Safety

3SE7 Cable-Operated Switches

General Information

Application

Cable-operated switches are used for monitoring or for EMERGENCY-STOP facilities on particularly endangered system sections. They are available with metal enclosures.

As the effective range of a cable-operated switch is limited by the length of the pull-wire, large systems can also be protected.

Cable-operated switches (requiring pulling at both ends) and conveyor belt unbalance track-ers are used primarily for monitoring very long belt systems.

Specifications

Switches with latching for implementation in EMERGENCY-STOP equipment correspond to the EN 418 standard.

Principle of operation

The switch contacts of the cable-operated switches and the conveyor belt unbalance protection devices are positive opening.

Cable-operated switches with one-side operation are held in free position by the pre-tension force on the turnbuckle.

- In the 3SE7 140, -150 and -160 cable-operated switches, both switching contacts are available for cable-break/cable pull signaling. The NO contact is used, for example, for signaling purposes.

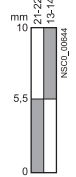
For switches with latching, with a pretensioned cable, the locking must be deactivated beforehand in order to return the switch to its free position.

Technical data

Type	3SE7 120	3SE7 150	3SE7 140	3SE7 141	3SE7 160	3SE7 310
Standards	IEC 60947-5-1, EN 60947-5-1; IEC 60204-1, EN 60204-1; EN ISO 13850					
Certifications	UL / CSA					
Electrical design	Contacts electrically isolated from each other					
Electrical loading						
• at AC-15	AC 400 V, 6A			AC 250 V, 2A	AC 400 V, 6A	
• minimum	AC/DC 24 V, 10 mA					
Short circuit protection	6 A (Slow acting)					
Mechanical endurance	> 1 x 10 ⁶ operating cycles					
Contact material	Fine silver					
Actuation	By pulling or breaking of a rope (cable)					
Rope length, maximum	10 m	25 m	50 m	75 m ¹⁾	2 x 50 m	–
Spacing between rope supports, maximum	2.5 m	3 m	5 m	5 m	5 m	–
Enclosure	GDAL alloy, coated (color), dark black RAL 9005					
Cover	Shock-resistant thermoplastic					
Degree of protection acc. To IEC 60529	IP65			IP67	1P65	
Ambient temperature	-25C to +70C					
Mounting	Designed for M 5					
Mounting space	30 mm and 40 mm					
Cable entry	2x(M20x1.5)	2x(M20x1.5)	1x(M16x1.5)	3x(M20x1.5)	2x(M25x1.5)	
Type of connection	M3.5 screw connection; Self-lifting pressure plate terminals					

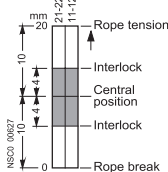
Travel diagrams

3SE7 120-2DD01



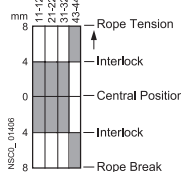
Central position

3SE7 140-1.F00



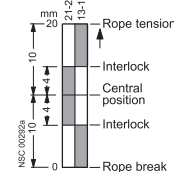
Central position

3SE7 141-1EG10



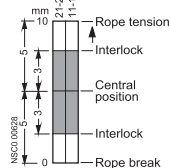
Central position

3SE7 140-1.D0.



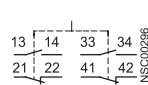
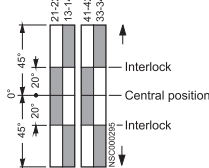
Central position

3SE7 120-1BF00, 3SE7 150-1BF00



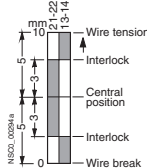
Central position

3SE7 160-1AE, 3SE7 310-1AE



Central position

3SE7 150-1.D00, 3SE7 150-2DD00



Central position

1) 75 m cable length possible provided the ambient temperature range is strictly observed, otherwise, 50 m.

Mechanical Safety

SIRIUS 3SE7 Cable-Operated Switches

Selection

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Selection and ordering data

Version	Wire length	Contacts	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
m							
Cable-operated switches							
	Metal enclosures, IP65 (cover made of molded plastic)	10					
	Metal enclosures, IP65 (cover made of molded plastic), with alignment window	25					
	Metal enclosures, IP65 (cover made of molded plastic), with alignment window, with LED, red, 24 V DC	25					
	Metal enclosures, IP65 (cover made of molded plastic)	50					
	Metal enclosures, IP67 (cover made of molded plastic), with EMERGENCY-STOP mushroom, with rotate-to-unlatch mechanism	75					
	Metal enclosures, IP65 with actuation on both sides	2 x 75					

➞ Positive opening according to IEC 60947-5-1, Appendix K.

Selection

Conveyor belt unbalance trackers



➔ Positive opening according to IEC 60947-5-1, Appendix K.

- With latching and button reset
- In addition with LED, red, 24 V DC

$$2 \text{ NO} + 2 \text{ NC}$$

B

3SE7 310-1AE00

1

1

1 unit

$$2 \text{ NO} + 2 \text{ NC}$$

B

3SE7 310-1AE04

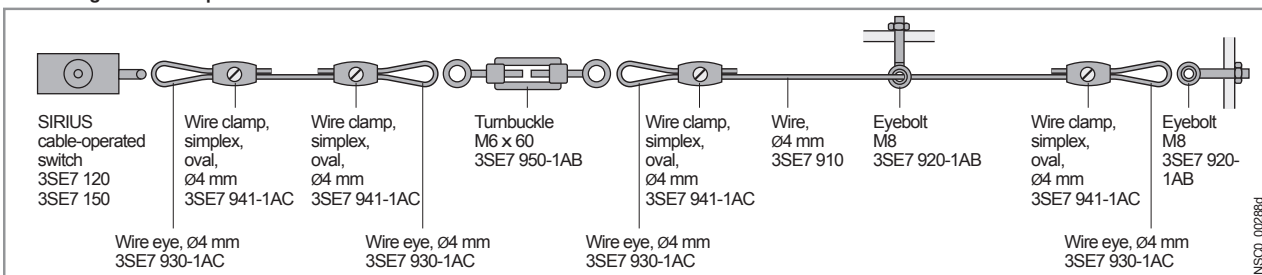
1

1

1 unit

Accessories

Short lengths of wire up to 25 m



The diagram illustrates the assembly of a cable-operated switch. The components and their part numbers are as follows:

- SIRIUS cable-operated switch** 3SE7 140
- Wire eye, Ø4 mm** 3SE7 930-1AD
- Wire clamp, simplex, oval, Ø4 mm** 3SE7 941-1AC
- Wire clamp, simplex, oval, Ø4 mm** 3SE7 941-1AC
- Wire eye, Ø4 mm** 3SE7 930-1AD
- Turnbuckle M6 x 60** 3SE7 950-1AB
- Wire eye, Ø4 mm** 3SE7 930-1AD
- Wire clamp, simplex, oval, Ø4 mm** 3SE7 941-1AC
- Wire, Ø4 mm** 3SE7 910
- Wire roller, rotatable** 3SE7 921-1AC
- Wire clamp, simplex, oval, Ø4 mm** 3SE7 941-1AC
- Wire eye, Ø4 mm** 3SE7 930-1AD
- Tension spring 35 N** 3SE7 931-1AD
- Eyebolt M10** 3SE7 920-1AC

Use of a tension spring is essential for lengths of wire ≥ 25 m.

Diagram illustrating the components and assembly of a cable-operated switch (SIGUARD cable-operated switch 3SE7 160) using various components:

- Tension spring** up to 2 x 50 m: 3SE7 931-1AD up to 2 x 75 m: 3SE7 931-1AE
- Wire clamp, simplex, oval, Ø4 mm** 3SE7 941-1AC
- Wire roller, rotatable** 3SE7 921-1AC
- Wire eye, Ø4 mm** 3SE7 930-1AD
- Turnbuckle M6 x 60** 3SE7 950-1AB
- Wire clamp, simplex, oval, Ø4 mm** 3SE7 941-1AC
- Wire roller, rotatable** 3SE7 921-1AC
- Wire eye, Ø4 mm** 3SE7 930-1AD
- SIGUARD cable-operated switch** 3SE7 160
- Wire clamp, simplex, oval, Ø4 mm** 3SE7 941-1AC
- Wire rollers, rotatable** 3SE7 921-1AC
- Wire clamp, simplex, oval, Ø4 mm** 3SE7 941-1AC
- Wire eye, Ø4 mm** 3SE7 930-1AD
- Tension spring** up to 2 x 50 m: 3SE7 931-1AD up to 2 x 75 m: 3SE7 931-1AE
- Wire, Ø4 mm** 3SE7 910

Use of a tension spring is essential for lengths of wire ≥ 25 m.

Large temperature fluctuations require corresponding compensation springs. For reliable connection the PVC sheath must be













removed from the clamping area of the steel trip-wire.
Wire supports must be used at the recommended intervals.

Mechanical Safety

SIRIUS 3SE7 Cable-Operated Switches

Accessories

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Version	Wire length/ diameter	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
Trip-wire with fixing						
	Steel wires , with red plastic sheath, Ø 4 mm ¹⁾	10 m	A	3SE7 910-3AA	1	1 unit
		15 m	A	3SE7 910-3AB	1	1 unit
		20 m	▶	3SE7 910-3AC	1	1 unit
		50 m	A	3SE7 910-3AH	1	1 unit
   	Wire clamps , galvanized white					
	• Oval	2 × Ø 4 mm	A	3SE7 941-1AC	1	1 unit
	• Simplex (1 set = 4 units)	2 × Ø 4 mm	▶	3SE7 943-1AC	1	4 units
	• Duplex (1 set = 4 units)	2 × Ø 4 mm	A	3SE7 944-1AC	1	4 units
	• Single (1 set = 4 units)	2 × Ø 4 mm	A	3SE7 942-1AA	1	4 units
	Tension springs (zinc-plated) to maintain the counter tension					
	• 13 N		A	3SE7 931-1AB	1	1 unit
	• 35 N, for trip-wires up to 50 m		▶	3SE7 931-1AD	1	1 unit
	• > 35 N, for trip-wires up to 2 × 75 m		▶	3SE7 931-1AE	1	1 unit
	Wire rollers for changing the direction of the wire, Ø 4 mm rotatable		A	3SE7 921-1AC	1	1 unit
	Fixtures for the wire rollers (incl. fixing nuts)		▶	3SE7 921-1AA	1	1 unit
	Wire eyes for changes in wire direction and improved power transmission at the fixing points (1 set = 4 units)	Ø 4 mm	▶	3SE7 930-1AD	1	4 units
	Eyebolts for fixing the wire					
	• Including M8 nut		A	3SE7 920-1AB	1	1 unit
	• Including M10 nut		▶	3SE7 920-1AC	1	1 unit
	Turnbuckles for precise adjustment of the pretension					
	• M6 x 60		A	3SE7 950-1AB	1	1 unit
	• M6 x 110		A	3SE7 950-1AD	1	1 unit
Spare parts						
	LED lamps , red 24 V DC 25 mm diameter; for M20 x 1.5 connection		D	3SX3 235	1	1 unit

¹⁾ Diameter including casing; the diameter of the steel wire is 3.2 mm.

3SE Mechanical Safety

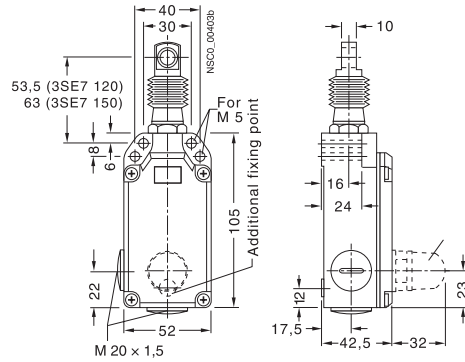
Cable-Operated Switches

3SE7, metal enclosures

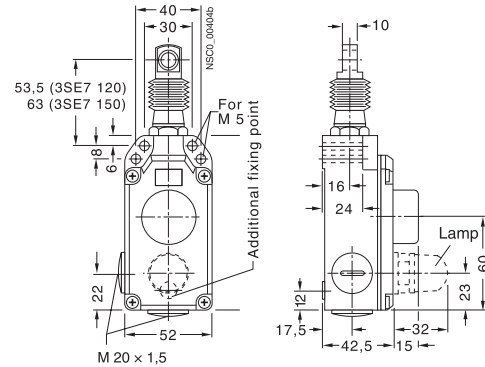
Dimension drawings

Metal enclosure

3SE7 120-2DD.., 3SE7 150-2DD..
without latching

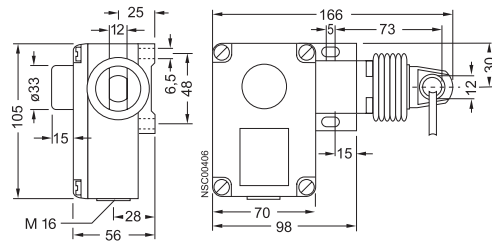


3SE7 120-1B..., 3SE7 150-1B...
with latching and button reset

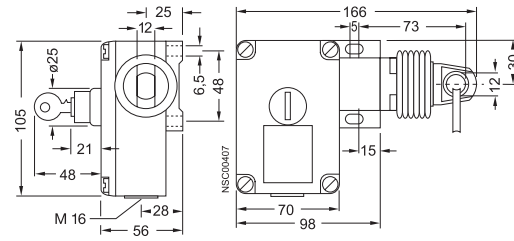


Metal enclosure

3SE7 140-1B...
with latching and button reset

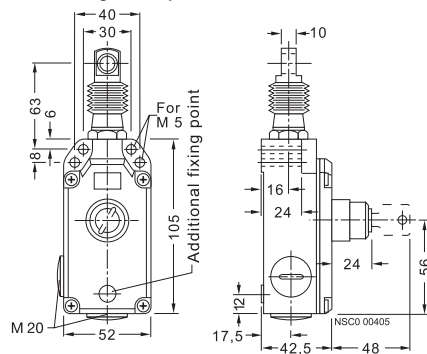


3SE7 140-1ECD.
with latching and key reset

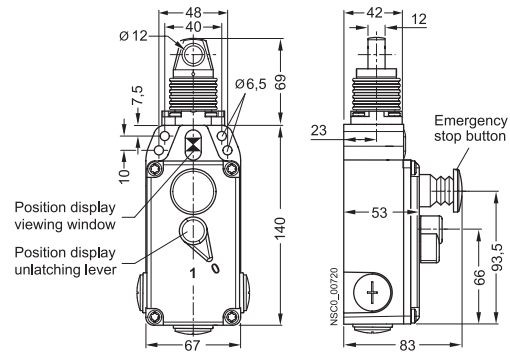


Metal enclosure

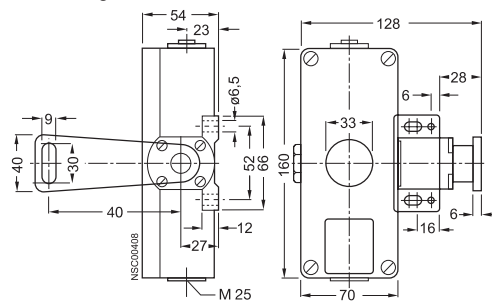
3SE7 150-1CD..
with latching and key reset



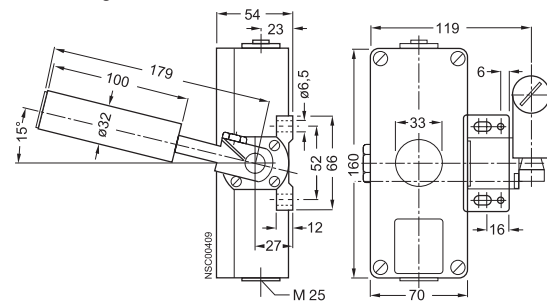
3SE7 141-1EG10.
with EMERGENCY STOP and Lockout release



3SE7 160-1AE..
with latching and button reset



3SE7 310-1AE.. conveyor belt unbalance protection device
with latching and button reset



Overview

Position switches with separate actuator are used where the position of doors, covers or protective grills must be monitored for safety reasons.

3SE5 position switches with separate actuator have the same enclosures as the standard switches (modular system).



Position switches with head for separate actuator

Design

Enclosure sizes

The 3SE5 switches are available in various enclosure sizes:

- Plastic enclosures according to EN 50047, 31 mm wide, IP65, 1 cable entry
 - Metal enclosures according to EN 50047, 31 mm wide, IP66/IP67, 1 cable entry
 - Plastic and metal enclosures according to EN 50041, 40 mm wide, IP66/IP67, 1 cable entry
 - Plastic enclosures, 50 mm wide, IP66/IP67, 2 cable entries
 - Metal enclosures, 56 mm wide, IP66/IP67, 3 cable entries
- Also available is a switch in the 3SE2 series which has arisen in this form according to general market requirements:
- Molded-plastic enclosures outside of the standards, enclosure width 52 mm, IP67

Enclosure versions

Various basic versions can be selected for the enclosures of the 3SE5 series:

- Available with two- or three-pole contact blocks designed as slow-action contacts
- Optional LED status display
- With mounted four- or five-pole M12 connector socket (available for the wide enclosures as an accessory for self-assembly)
- With 6-pole connector socket + PE on the metal enclosures
- Similarly with a combination of connector socket and LED indicators
- Metal enclosures for explosion protection (ATEX) ([see online](#))
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs ([see online](#))

For a description of the basic switches, [see page 13/6](#).

Operation

The actuator head is included in the scope of supply. For actuation from four directions it can be adjusted through $4 \times 90^\circ$. The switches can also be approached from above.

The twist actuators of the 3SE2 243 and 3SE2 257 switches with special enclosures cannot be changed. The switches can be approached from the two broad sides and from above.

The actuators are not included in the scope of supply of the position switch and must be ordered separately from various versions to suit the application ([see page 13/86](#)).

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

Radius actuators

The position switches with radius actuators are particularly suitable for rotatable protective devices. The movable actuation key allows even small radii to be approached. Damage to the switch and the actuator due to inaccurate approach is prevented.

Locking devices

A high-grade steel blocking insert for attaching up to eight padlocks is available for even more safety ([see page 13/86](#)).



Blocking insert with padlock

Dust protection

A rubber cap to protect the twist actuator from contamination is available for operation in dusty environments ([see page 13/86](#)).

Contact reliability

The new contact blocks ensure an extremely high contact stability. This applies even when the devices are switching low voltages and currents, e.g. 1 mA at 5 V DC.

Positive opening ➡

The NC contacts of the switch are forced open mechanically, positively-driven and reliably by the plunger. This is referred to as "positive opening".

Limit Switches





SIRIUS 3SE5 Interlock Switches

**3SE5, plastic enclosures
with separate actuator**

Selection and ordering data

Complete units

2 or 3 contacts · 5 directions of approach · Degree of protection IP65 or IP66/IP67 · Cable entry M20 × 1.5

Version ¹⁾	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
				Order No.	List Price \$ per PU			kg
Enclosure width 31 mm to EN 50047								
	5 directions of approach							
	Slow-action contacts	1 NO + 1 NC --	⊙ ▶	3SE5 232-0RV40		1	1 unit	102 0.150
	Slow-action contacts	1 NO + 2 NC --	⊙ ▶	3SE5 232-0QV40		1	1 unit	102 0.155
	With increased minimum pull-out force 30 N							
	Slow-action contacts	1 NO + 1 NC --	⊙ B	3SE5 232-0QV40-1AA1		1	1 unit	102 0.150
	With M12 connector socket, 4-pole (250 V, 4 A)							
	Slow-action contacts	1 NO + 1 NC --	⊙ B	3SE5 234-0RV40-1AC4		1	1 unit	102 0.165
	Slow-action contacts	1 NO + 2 NC --	⊙ B	3SE5 234-0QV40-1AE0		1	1 unit	102 0.170
	With 2 LEDs, yellow/green							
	Slow-action contacts	1 NO + 1 NC 24 V DC	⊙ B	3SE5 232-1RV40		1	1 unit	102 0.155
	Slow-action contacts	1 NO + 1 NC 230 V AC	⊙ B	3SE5 232-3RV40		1	1 unit	102 0.110
	With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs							
	Slow-action contacts	1 NO + 1 NC 24 V DC	⊙ C	3SE5 234-1RV40-1AF3		1	1 unit	102 0.175
	Enclosure width 50 mm							
	5 directions of approach							
	Slow-action contacts	1 NO + 2 NC --	⊙ B	3SE5 242-0QV40		1	1 unit	102 0.110
	With increased minimum pull-out force 30 N							
	Slow-action contacts	1 NO + 1 NC --	⊙ B	3SE5 242-0RV40-1AA1		1	1 unit	102 0.110
	With 2 LEDs, yellow/green							
	Slow-action contacts	1 NO + 2 NC 24 V DC	⊙ B	3SE5 242-1QV40		1	1 unit	102 0.120
	Slow-action contacts	1 NO + 2 NC 230 V AC	⊙ C	3SE5 242-3QV40		1	1 unit	102 0.120

⊙ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/86).

For 1/2" NPT adaptors and cable glands, see page 13/48.

Mechanical Safety

SIRIUS 3SE5 Interlock Switches

3SE5, plastic enclosures
Enclosure width 40 mm acc. to EN 50041

1
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13

Selection and ordering data

Complete units

2 or 3 contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version ¹⁾	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	

Enclosure width 40 mm acc. to EN 50041



With separate actuator



With 2 LEDs

5 directions of approach						
Slow-action contacts	1 NO + 2 NC	—	➞ B	3SE5 132-0QV20	1	1 unit
With 2 LEDs, yellow/green						
Slow-action contacts	1 NO + 2 NC	24 V DC	➞ C	3SE5 132-1QV20	1	1 unit
Slow-action contacts	1 NO + 2 NC	230 V AC	➞ C	3SE5 132-3QV20	1	1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators.

➞ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/86).

Limit Switches

SIRIUS 3SE5 Interlock Switches

3SE5, metal enclosures
Enclosure width 31 mm acc. to EN 50047

Selection and ordering data

Complete units

2 or 3 contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version ¹⁾	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*
				Configurator		
				Order No.	Price per PU	

Enclosure width 31 mm acc. to EN 50047



With separate actuator

5 directions of approach

Slow-action contacts	1 NO + 1 NC	—	→ A	3SE5 212-0RV40	1	1 unit
Slow-action contacts	1 NO + 2 NC	—	→ B	3SE5 212-0QV40	1	1 unit



With 2 LEDs

With 2 LEDs, yellow/green

Slow-action contacts	1 NO + 1 NC	24 V DC	→ B	3SE5 212-1RV40	1	1 unit
Slow-action contacts	1 NO + 1 NC	230 V AC	→ B	3SE5 212-3RV40	1	1 unit

⚙ For online configurator see www.siemens.com/sirius/configurators.






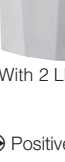



→ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/86).

Selection and ordering data

Complete units

2 or 3 contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version ¹⁾	Contacts	LEDs	DT	Complete units	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
				Order No.	List Price \$ per PU			kg
Enclosure width 40 mm to EN 50041								
 With separate actuator	5 directions of approach							
	Slow-action contacts	1 NO + 2 NC --	➡	3SE5 112-0QV10		1	1 unit	102 0.360
	With increased minimum pull-out force 30 N							
 With M12 socket	Slow-action contacts	1 NO + 2 NC --	➡ B	3SE5 112-0QV10-1AA7		1	1 unit	102 0.360
	With M12 connector socket, 5-pole (125 V, 4 A)							
	Slow-action contacts	1 NO + 1 NC --	➡ C	3SE5 114-0RV10-1AC5		1	1 unit	102 0.360
 With M12 socket	Slow-action contacts	2 NC --	➡ C	3SE5 114-0QV10-1AE1		1	1 unit	102 0.360
	With connector socket, 6-pole + PE (250 V, 10 A)							
	Slow-action contacts	1 NO + 2 NC --	➡ C	3SE5 115-0QV10-1AD1		1	1 unit	102 0.380
 With 2 LEDs	With 2 LEDs, yellow/green							
	Slow-action contacts	1 NO + 2 NC 24 V DC	➡ B	3SE5 112-1QV10		1	1 unit	102 0.370
	Slow-action contacts	1 NO + 2 NC 230 V AC	➡ C	3SE5 112-3QV10		1	1 unit	102 0.370
 With 2 LEDs	With M12 connector socket, 5-pole (125 V, 4 A) and 2 LEDs							
	Slow-action contacts	1 NO + 1 NC 24 V DC	➡ C	3SE5 114-1RV10-1AF3		1	1 unit	102 0.360
	With connector socket, 6-pole + PE (10 A) and 2 LEDs							
 With 2 LEDs	Slow-action contacts	1 NO + 1 NC 24 V DC	➡ C	3SE5 115-1RV10-1AF2		1	1 unit	102 0.380
Enclosure width 56 mm								
 With separate actuator	5 directions of approach							
	Slow-action contacts	1 NO + 2 NC --	➡	3SE5 122-0QV10		1	1 unit	102 0.360
	With increased minimum pull-out force 30 N							
 With 2 LEDs	Slow-action contacts	1 NO + 2 NC --	➡ B	3SE5 122-0QV10-1AA7		1	1 unit	102 0.360
	With 2 LEDs, yellow/green							
	Slow-action contacts	1 NO + 2 NC 24 V DC	➡	3SE5 122-1QV10		1	1 unit	102 0.370
 With 2 LEDs	Slow-action contacts	1 NO + 2 NC 230 V AC	➡ C	3SE5 122-3QV10		1	1 unit	102 0.370

➡ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/86).

For 1/2" NPT adaptors and cable glands, see page 13/48.

Limit Switches

SIRIUS 3SE5 Interlock Switches

3SE5, metal and plastic enclosures Accessories

Selection and ordering data

Version	DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Actuators for 3SE5							
 3SE5 000-0AV01		Standard actuators, length 75.6 mm	A	3SE5 000-0AV01	1	1 unit	102 0.040
 3SE5 000-0AV02		With vertical fixing, length 53 mm	▶	3SE5 000-0AV02	1	1 unit	102 0.070
 3SE5 000-0AV03		With transverse fixing, length 47 mm	▶	3SE5 000-0AV03	1	1 unit	102 0.070
 3SE5 000-0AV06		Radius actuators, length 51 mm	▶	3SE5 000-0AV04	1	1 unit	102 0.070
		• Direction of approach from the left	▶	3SE5 000-0AV06	1	1 unit	102 0.070
		• Direction of approach from the right	▶	3SE5 000-0AV05	1	1 unit	102 0.090
 3SE5 000-0AV05		Universal radius actuators, length 77 mm					
 3SE5 000-0AV07		Universal radius actuators, heavy-duty	A	3SE5 000-0AV07-1AK2	1	1 unit	102 0.120
		• Length 67 mm	A	3SE5 000-0AV07	1	1 unit	102 0.090
		• Length 77 mm					
Optional accessories for 3SE5							
 3SE5 000-0AV08-1AA2		Protective caps made of black rubber for the actuator head, to protect the actuator openings from contamination	B	3SE5 000-0AV08-1AA2	1	1 unit	102 0.010
		Not to be used for 3SE5 2.. plastic enclosures.					
 3SE5 000-0AV08-1AA3		Blocking inserts , high-grade steel, for actuator head, for up to 8 padlocks	B	3SE5 000-0AV08-1AA3	1	1 unit	102 0.065
Connections for 3SE5, 3SE2							
 3SY3 127		Connector sockets (4-pole), M12, fixed for M20 x 1.5 For max. 250 V, 4 A With 0.25 mm ² connecting cable, plastic, degree of protection IP67, ambient temperature -40 to +85 °C	B	3SY3 127	1	1 unit	102 0.010
 3RX8 000		Cable boxes (4-pole), M12 With terminal compartment, can be pre-assembled	A	3RX8 000-0CB45	1	1 unit	574 0.015
		Angular cable boxes (4-pole), M12 With terminal compartment, can be pre-assembled	A	3RX8 000-0CC45	1	1 unit	574 0.015
 3SX9 926		Connector sockets (5-pole), M12, fixed for M20 x 1.5 For max. 125 V, 4 A With 0.25 mm ² connecting cable, plastic, degree of protection IP67, ambient temperature -40 to +85 °C	B	3SY3 128	1	1 unit	102 0.010
		Cable boxes (5-pole), M12 With terminal compartment, can be pre-assembled	A	3RX8 000-0CB55	1	1 unit	574 0.016
		Angular cable boxes (5-pole), M12 With terminal compartment, can be pre-assembled	A	3RX8 000-0CC55	1	1 unit	574 0.016
		Cable glands M20 x 1.5 Plastic	A	3SX9 926	1	1 unit	102 0.010








Mechanical Safety

3SE2 Interlock Switches

3SE2, plastic enclosures
with separate actuator

Selection and ordering data

1 contact · 3 contacts · Moving double-break contacts^{1) 2)}

Actuation	Enclosure width	Length of actuator	DT	3SE. position switches with 3 slow-action contacts		3SE. position switches with 1 slow-action contact	Wght. approx.
				 Ident. No. 12 acc. to EN 50 013		 Ident. No. 01 acc. to EN 50 013	
				Order No.	List Price \$ 1 unit	Order No.	List Price \$ 1 unit
	mm	mm			kg		kg
Molded plastic enclosure IP 67							
3SE2 243-0XX Top and side entry¹⁾							
 M20 x 1.5 connecting thread				→ 3SE2 243-0XX40	0.140	→ 3SE2 257-6XX40	0.120
• Extraction force 5 N 52				→ 3SE2 243-0XX	0.140	→ 3SE2 257-6XX	0.120
• Extraction force 30 N 52				→ 3SE2 243-0XX30	0.140	→ 3SE2 257-6XX30	0.120
• With automatic ejection 52							
M16 x 1.5 connecting thread				→ 3SE2 243-0XX48	0.140	→ 3SE2 257-6XX48	0.140
• Extraction force 5 N 52				→ 3SE2 243-0XX18	0.140	→ 3SE2 257-6XX18	0.140
• Extraction force 30 N 52				→ 3SE2 243-0XX38	0.140	→ 3SE2 257-6XX38	0.140
• With automatic ejection 52							
Actuators							
• Standard actuator ($r_{min.} = 150 \text{ mm}$)				3SX3 218	0.020		
							
• Radius actuator (universal) ($r_{min.} = 45 \text{ mm}$)				3SX3 228	0.025		
							
• Ball catch (up to 100 N)				3SX3 217	0.035		
							
• Actuator with dust protector and slit cover (1 set)				3SX3 234	0.035		
							
• Radius actuator				3SX3 256	0.020		
Accessories							
• Slit cover only for 3SX3234 (1 set = 3 units)				3SX3 233	0.005		

For operation, operating speed and travel, see Page 13/92.

→ Positive opening acc. to IEC 60 947-5-1, Appendix K, and DIN VDE 0660 Part 200.

1) Supplied without actuator.

2) For conduit thread adaptors, see page 13/48.

Limit Switches

SIRIUS 3SE5 Interlock Switches

Technical data

Benefits

The 3SE5 position switches with separate actuator differ from the previous series through the following new characteristics:

- All enclosure sizes with increased corrosion protection
- All enclosure sizes are optionally available with a LED signaling indicator.
- The three-pole contact block 1 NO + 2 NC is available for all enclosure sizes.
- The plastic enclosure has simple and fast wiring equipment which makes it possible to save from approx. 20 to 25 % of the time when connecting.
- The ASIsafe electric component is integrated for the versions with the AS-Interface connection ([see online](#)); an adapter is not required.

Application

Position switches with separate actuator are used where the position of doors, covers or protective grills must be monitored for safety reasons.

The position switch can only be operated with the matching coded actuator. Simple overruling by hand or auxiliary devices is impossible.

Devices are available with enclosure versions to suit the particular ambient conditions. Different control tasks can be performed with the best contact blocks suited for the particular purpose. Dimensions, fixing points of the enclosure are in

accordance with EN 50041 or EN 50047 standards. The devices are suitable for use in any climate.

Standards

IEC 60947-5-1 or EN 60947-5-1.

The protective measure of "total insulation" by the molded-plastic enclosure is guaranteed by the use of molded-plastic screw-glands.

Safety position switches

For controls according to IEC 60204-1 or EN 60204-1 the devices can be used as a safety position switch. To secure position switches against changes in their position, keyed techniques must be employed on installation.

Safety circuits

IEC 60947-5-1 and EN 60947-5-1 require positive opening of the NC contacts, i.e. for the purposes of personal safety, the assured opening of NC contacts is expressly stipulated for the electrical equipment of machines in all safety circuits and marked according to the IEC standard 60947-5-1 with the symbol ☞.

Category 3 according to ISO 13849-1 (EN 954-1) can be attained with a position switch with a separate actuator if the corresponding failsafe evaluation units are selected and correctly installed, e.g. the 3TK28 safety relays or matching units from the ASIsafe, SIMATIC or SINUMERIK product ranges.





Category 4 can be achieved when using an additional position switch.

Technical specifications

Type		3SE5 1...-V.., 3SE5 2...-V..	3SE2 257-XX..	3SE2 243-XX..		
General data						
Standards		IEC 60947-5-1, EN 60947-5-1				
Rated insulation voltage U_i	V	400	500			
Pollution degree acc. to IEC 60664-1		Class 3	Class 3			
Rated impulse withstand voltage U_{imp}	kV	6				
Rated operational voltage U_e	V	400 AC; over 300 V AC only equal potential	500 AC; over 380 V AC only equal potential			
Conventional thermal current I_{th}	A	6	10			
Rated operational current I_e		2-pole	3-pole	1-pole		
• With alternating current 50/60 Hz		$I_e/AC-15$	$I_e/AC-15$	$I_e/AC-12$		
	- At 24 V	A	6	6	10	
	- At 120 V	A	6	3	10	
	- At 240 V	A	3	1.5	10	
	- At 400 V	A	—	—	10	
	- At 500 V	A	—	—	10	
	• For direct current		$I_e/DC-13$	$I_e/DC-13$	$I_e/DC-12$	
		- At 24 V	A	3	3	10
		- At 125 V	A	0.55	0.55	—
		- At 250 V	A	0.27	0.27	—
- At 110 V		A	—	—	4	
- At 220 V		A	—	—	1	
- At 440 V		A	—	—	0.5	
Short-circuit protection ¹⁾						
	• With DIAZED fuse links, gG operational class	A	6	6		
	• With fuse links, quick		—	10		
• With miniature circuit breaker, Char. C	A	1	2	—		
Mechanical endurance		1 ×10 ⁶ operating cycles				
Electrical endurance						
• With 3RH.1, 3RT contactors in size S00, S0		10 ×10 ⁶ operating cycles	> 1 ×10 ⁶ operating cycles			
• For utilization category AC-15 when switching off $I_e/AC-15$ at 240 V		0.1 ×10 ⁶ operating cycles	0.5 ×10 ⁶ operating cycles			
Switching frequency		6000 operating cycles/h				
With 3RH.1, 3RT contactors in size S00, S0						
Minimum pull-out force for positive opening	N	20	10	30		

Configuration

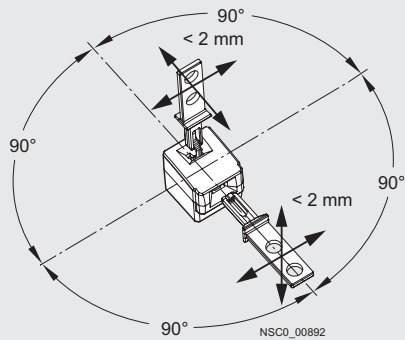
Operation and operating travel of actuators

Operation by a separate actuator  Positive opening acc. to EN 60947-5-1 v_{max} Max. actuating speed  Direction of operation	Contact blocks Terminal designation acc. to EN 50013	Nominal travel  Contact closed  Contact open Actuator in actuator head: NC is closed
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Separate actuators

Standard actuators

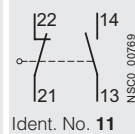
Axial and lateral actuation ($4 \times 90^\circ$)



Minimum force required in operating direction 30 N (on retraction)

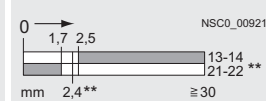
Slow-action contacts

1 NO + 1 NC



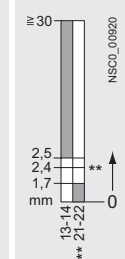
Lateral actuation

3SE5 ...-RV..

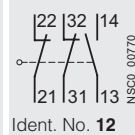


Axial actuation

3SE5 ...-RV..



1 NO + 2 NC



3SE5 ...-QV..

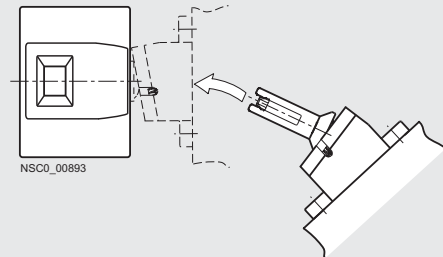


3SE5 ...-QV..



Radius actuators (all directions of approach)

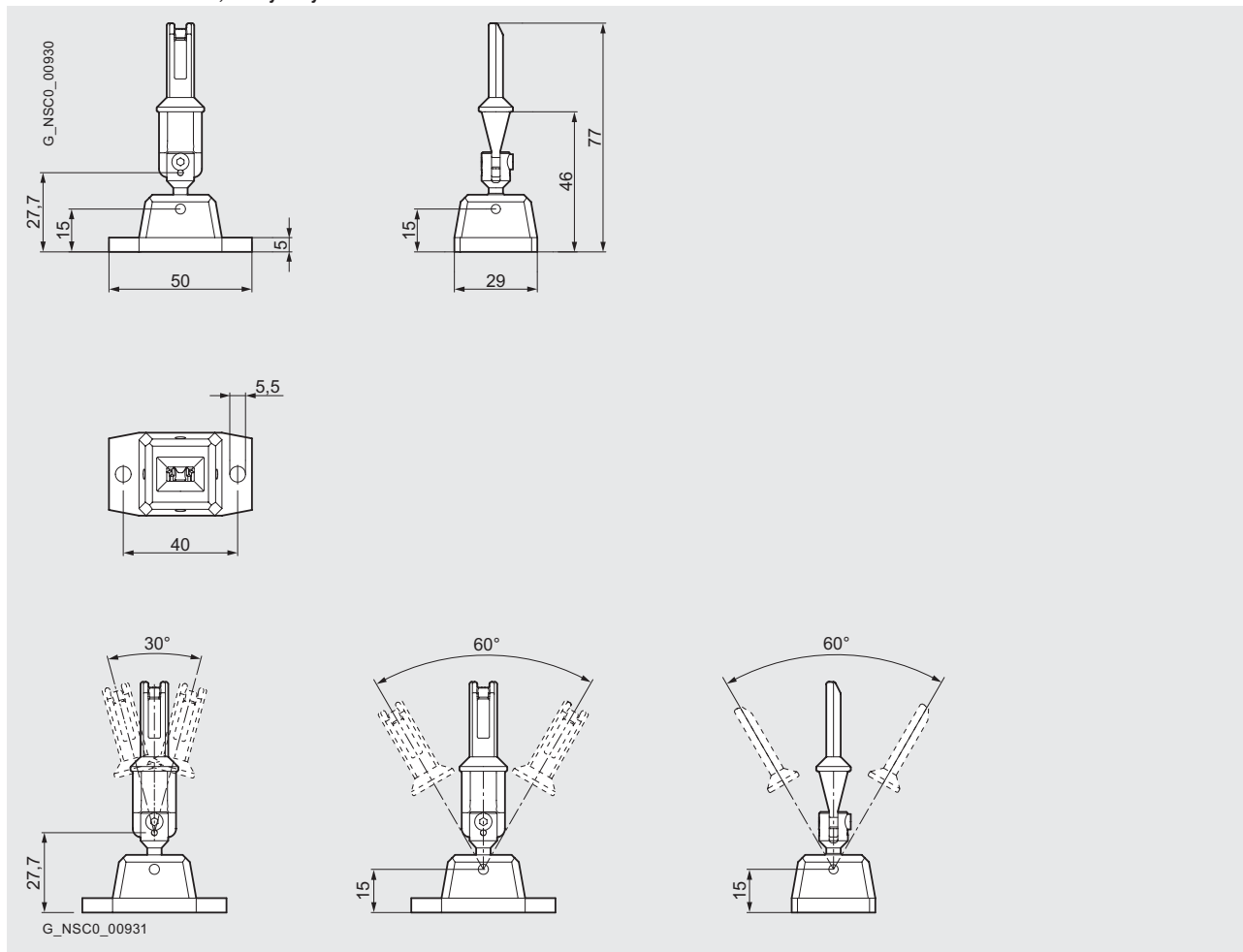
Example: direction of approach from the left



For connector assignment, see page 13/61.

3SE5 with separate actuator Metal and plastic enclosures

3SE5 000-0AV07
universal radius actuator, heavy duty




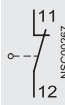
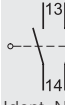
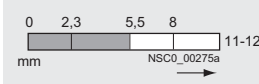
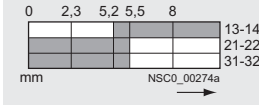
Limit Switches

SIRIUS 3SE5 Interlock Switches

3SE2 with separate actuator Plastic enclosures

Configuration

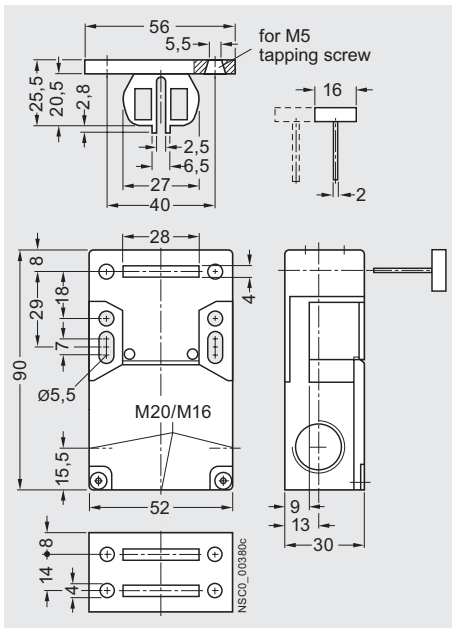
Operation and operating travel of actuators

Operation by a separate actuator	Contact blocks	Nominal travel	Minimum force required in operating direction on retraction
v_{max} Max. actuating speed \rightarrow Direction of operation Radius actuation: for all directions of approach	Terminal designation acc. to EN 50013	 Contact closed Contact open Actuator in actuator head: NC is closed	
Separate actuators			
Standard and radius actuators Axial and lateral actuation	Slow-action contacts 1 NC  Ident. No. 01 1 NO + 2 NC  Ident. No. 12	Lateral actuation 3SE2 257--XX..  3SE2 243--XX.. 	30 N or 5 N

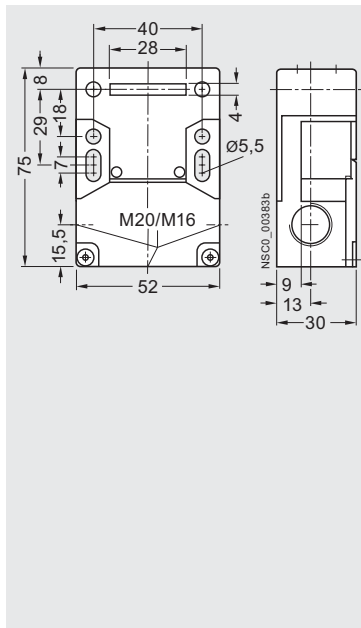
*) Radius actuator: $R_{min} > 38$ mm.

Dimensional drawings

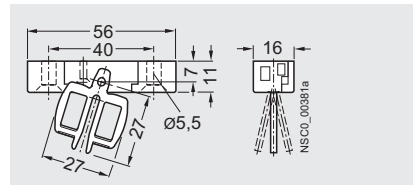
3SE2 243, lateral and front-end actuation,
with 3SX3 218 standard actuator



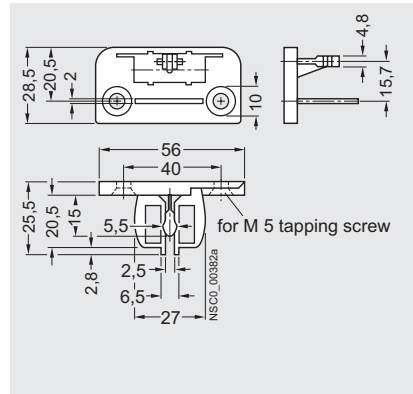
3SE2 257, lateral and front-end actuation



3SX3 228
universal radius actuator



3SX3 217
actuator with ball locating



Overview

The position switches with solenoid interlocking are exceptional, technically safe devices which restrict and prevent an unforeseen or intentional opening of protective doors, protective grilles or other covers as long as a dangerous situation is present (i.e. follow-on motion of the shutdown machine).



The safety position switches with solenoid interlocking are comprised of a switch part with electromechanical interlock and a mechanical actuator which has to be ordered separately.

They are rugged protective devices that enable the greatest possible safety for man and machine.

The position switches with solenoid interlocking are offered in plastic or metal enclosures.
Dimensions (W × H × D):

- 3SE5 3: 54 mm × 185 mm × 43.5 mm,
- 3SE2 8: 90 mm × 100 mm (+ head 41.3 mm) × 45 mm.

Operation

The actuator head is included in the scope of supply. For actuation from four directions it can be adjusted through 4 × 90°. The 3SE5 3 switches can also be approached from above.

The actuators are not included in the scope of supply of the position switch and must be ordered separately from a choice of six versions to suit the application (see page 13/97).

Actuation data:

- Maximum actuating speed $v_{\max} = 1.5 \text{ m/s}$
- Minimum actuating speed $v_{\min} = 0.4 \text{ mm/s}$
- Minimum force in the direction of actuation $F_{\min} = 30 \text{ N}$

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

Radius actuators

The position switches with radius actuators are particularly suitable for rotatable protective devices. The movable actuation key allows even small radii to be approached. Damage to the switch and the actuator due to inaccurate approach is prevented.

Locking devices

A high-grade steel locking device for attaching up to eight padlocks is available for even more safety (see page 13/97).

Dust protection

A rubber cap to protect the actuator head from contamination is available for operation in dusty environments (see page 13/97).

Solenoid interlocking

There are two versions for locking the actuator:

- Spring-actuated lock (closed-circuit principle) with various release mechanisms
- Magnetic field lock (open-circuit principle)

The spring-actuated switch is equipped with an auxiliary release for emergency situations or setup mode. Available as options:

- Escape release or
- Emergency release

Contact blocks

The position switches with solenoid interlocking have one contact block each for:





- Monitoring the actuator or the position of the protective door
- Monitoring the position of the solenoid

The mechanical design of the switch corresponds to the requirements of the failsafe principle according to EN 1088.

Optical signaling equipment

The position switches with solenoid interlocking are available with an optional optical signaling device.

The signaling device indicates the switch position of the lock and the protective device optically by means of 2 LEDs on the front.

Protective device	Interlock	Display	Meaning
Closed	Released	 ¹⁾  ²⁾	Actuator free to be pulled
Closed	Closed	 ²⁾	Actuator locked
Open	Open	 ¹⁾	Actuator pulled

Note:

The voltage of the LEDs at the monitored contacts must be the same as the operational voltage of the solenoid (same potential).

¹⁾ Yellow LED.

²⁾ Green LED.

Limit Switches

SIRIUS 3SE5 Interlock Switches

3SE5 / 3SE2 with solenoid locking

General data

Benefits

The new generation of 3SE5 3 position switches offers:

- More safety through higher locking forces:
 - 1300 N with plastic enclosure
 - 2600 N with metal enclosure
- Various release mechanisms: lock release, escape release and emergency release
- Two contact blocks each with three contacts as standard equipment, hence fewer versions needed
- Same dimensions for all enclosure variants: Plastic, metal or with integrated ASIsafe
- An extensive range of actuators
- An optional LED status display 24 V DC, 115 V AC or 230 V AC for all switch variants

Application

The position switches with solenoid interlocking are exceptional, technically safe devices which restrict and prevent an unforeseen or intentional opening of protective doors, protective grilles or other covers as long as a dangerous situation is present (i.e. follow-on motion of the shutdown machine).

The safety position switches with solenoid interlocking have the following functions:

- Enabling the machine or process with closed and locked protective device
- Locking the machine or process with opened protective device
- Position monitoring of the protective device and solenoid

Standards

The switches comply with the standards IEC 60947-1 (Low-Voltage Controlgear, General) and IEC 60947-5-1 (Electromechanical Control Devices).

The mechanical design of the switch corresponds to the requirements of the failsafe principle according to EN 1088.

Approvals

The switches are approved for use with locking devices according to EN 1088 and EN 292, Parts 1 and 2.

3SE5 3 position switches with solenoid interlocking bear the VDE test mark for tested according to GS-ET19 (Test Principles of the German Trade Association for Locking Devices with Electromagnetic Interlocks).

The 3SE2 8 metal-enclosed position switches with solenoid interlocking have been awarded a test certificate from the BIA (Berufsgenossenschaftliches Institut für Arbeitssicherheit).

Category 3 according to ISO 13849-1 (EN 954-1) can be attained with a position switch with solenoid interlocking if the corresponding failsafe evaluation units are selected and correctly installed, e. g. the 3TK28 safety relays or matching units from the ASIsafe, SIMATIC or SINUMERIK product ranges.

Category 4 can be achieved when using an additional position switch.

They are approved according to UL 508, UL 50 and UL 746-C.

Solenoid interlocking

The separate actuator operates in a similar way to the coding of a key and protects against manipulation. It transmits the locking force to the protective device and helps to monitor its position.

There are two versions of locking:

Spring-actuated lock (closed-circuit principle)

- In the standard version, the position switch locks by means of spring force and releases by means of electromagnetic force. In the case of voltage failure, it reliably prevents the protective device from opening when machine parts are still moving.
- The switch is equipped with an auxiliary release for emergency situations or setup mode.
- An auxiliary release which can be secured with a lock to prevent misuse is available as a version.

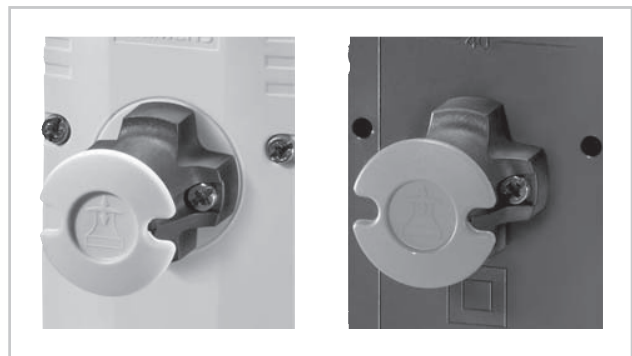


Auxiliary release

Auxiliary release with lock

The new 3SE5 3 position switches are also available with an escape release or an emergency release.

- Personnel working inside the hazard zone can use the escape release feature to manually release the interlock without tools from the escape side (hazardous area side) so that they can exit the hazard area. An intentional act (in this case pulling the gray actuator) is required to release the locking mechanism and restore the normal operating state.
- The emergency release enables someone in an emergency situation to manually release the interlock without tools from the access side (outside the hazardous area). Releasing the lock and restoring the normal operating state must require effort which is comparable to repair activity, in this case disassembly of the red actuator and resetting the mechanical lock.



Escape release from the front

Emergency release from the back

Magnetic field lock (open-circuit principle)

- The second version offers locking by means of electromagnetic force and release by means of spring force. This version has an advantage when it is necessary to quickly access the machine after a power failure occurs, or in the case of very short overtravel times.

Mechanical Safety

SIRIUS 3SE5 Interlock Switches

**3SE5, plastic enclosures
with locking force up to 1200 N**

Selection and ordering data

6 slow-action contacts · 5 directions of approach · Cable entry 3 × M20 × 1.5 · Degree of protection IP66/IP67
Locking force 1300 N (1000 N according to GS-ET 19)

Interlock ¹⁾	LEDs	Solenoid Rated opera- tional voltage	DT	Complete units Position monitoring: Actuators: 1 NO + 2 NC Solenoid: 1 NO + 2 NC	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.		
V				Order No.	Price \$ per PU			kg		
1300 N locking force · Enclosure width 54 mm										
	Spring-actuated locks									
	• With auxiliary release	--	24 DC	⊕ A	3SE5 322-0SD21	1	1 unit	102	0.590	
		--	115 AC	⊕ B	3SE5 322-0SD22	1	1 unit	102	0.590	
		--	230 AC	⊕ B	3SE5 322-0SD23	1	1 unit	102	0.590	
	Yellow/Green	24 DC	⊕ A	3SE5 322-1SD21	1	1 unit	102	0.590		
	Yellow/Green	115 AC	⊕ B	3SE5 322-2SD22	1	1 unit	102	0.590		
	Yellow/Green	230 AC	⊕ B	3SE5 322-3SD23	1	1 unit	102	0.590		
	• With auxiliary release	--	24 DC	⊕ ▶	3SE5 322-0SE21	1	1 unit	102	0.745	
	With lock	--	115 AC	⊕ B	3SE5 322-0SE22	1	1 unit	102	0.745	
		--	230 AC	⊕ B	3SE5 322-0SE23	1	1 unit	102	0.745	
	Yellow/Green	24 DC	⊕ B	3SE5 322-1SE21	1	1 unit	102	0.745		
	Yellow/Green	115 AC	⊕ B	3SE5 322-2SE22	1	1 unit	102	0.745		
	Yellow/Green	230 AC	⊕ B	3SE5 322-3SE23	1	1 unit	102	0.745		
		• With escape release	--	24 DC	⊕ B	3SE5 322-0SF21	1	1 unit	102	0.590
from the front		--	115 AC	⊕ B	3SE5 322-0SF22	1	1 unit	102	0.590	
		--	230 AC	⊕ B	3SE5 322-0SF23	1	1 unit	102	0.590	
Yellow/Green		24 DC	⊕ B	3SE5 322-1SF21	1	1 unit	102	0.590		
Yellow/Green		115 AC	⊕ B	3SE5 322-2SF22	1	1 unit	102	0.590		
Yellow/Green		230 AC	⊕ B	3SE5 322-3SF23	1	1 unit	102	0.590		
• With escape release		--	24 DC	⊕ B	3SE5 322-0SL21	1	1 unit	102	0.590	
from the front and emergency release from back										
	• For ambient temperature	--	24 DC	⊕ B	3SE5 322-0SL21-1AJ0	1	1 unit	102	0.590	
	up to to -40 °C									
	• With escape release	--	24 DC	⊕ B	3SE5 322-0SG21	1	1 unit	102	0.590	
	from the back	--	115 AC	⊕ B	3SE5 322-0SG22	1	1 unit	102	0.590	
	and auxiliary release	--	230 AC	⊕ B	3SE5 322-0SG23	1	1 unit	102	0.590	
	from the front	Yellow/Green	24 DC	⊕ ▶	3SE5 322-1SG21	1	1 unit	102	0.590	
		Yellow/Green	115 AC	⊕ B	3SE5 322-2SG22	1	1 unit	102	0.590	
	Yellow/Green	230 AC	⊕ B	3SE5 322-3SG23	1	1 unit	102	0.590		
	• With escape release	--	24 DC	⊕ B	3SE5 322-0SH21	1	1 unit	102	0.745	
	from the back and auxiliary release with lock from the front									
	• With emergency release	--	24 DC	⊕ B	3SE5 322-0SJ21	1	1 unit	102	0.745	
		from the back	--	115 AC	⊕ B	3SE5 322-0SJ22	1	1 unit	102	0.745
		and auxiliary release	--	230 AC	⊕ B	3SE5 322-0SJ23	1	1 unit	102	0.745
		from the front	Yellow/Green	24 DC	⊕ B	3SE5 322-1SJ21	1	1 unit	102	0.745
		Yellow/Green	115 AC	⊕ B	3SE5 322-2SJ22	1	1 unit	102	0.745	
	Yellow/Green	230 AC	⊕ B	3SE5 322-3SJ23	1	1 unit	102	0.745		
	Magnetic field locks									
		--	24 DC	⊕ ▶	3SE5 322-0SB21	1	1 unit	102	0.590	
		--	115 AC	⊕ B	3SE5 322-0SB22	1	1 unit	102	0.590	
		--	230 AC	⊕ B	3SE5 322-0SB23	1	1 unit	102	0.590	
	Yellow/Green	24 DC	⊕ A	3SE5 322-1SB21	1	1 unit	102	0.590		
	Yellow/Green	115 AC	⊕ B	3SE5 322-2SB22	1	1 unit	102	0.590		
	Yellow/Green	230 AC	⊕ B	3SE5 322-3SB23	1	1 unit	102	0.590		

⊙ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/97).

For 1/2" NPT adaptors and cable glands, see page 13/48.



Limit Switches

SIRIUS 3SE5 Interlock Switches

**3SE5, metal enclosures
with locking force up to 2000 N**

Selection and ordering data

6 slow-action contacts · 5 directions of approach · Cable entry 3 × M20 × 1.5 · Degree of protection IP66/IP67
Locking force 2600 N (2000 N according to GS-ET 19)

Interlock ¹⁾	LEDs	Solenoid Rated opera- tional voltage	DT	Complete units Position monitoring: <input type="checkbox"/> Actuators: 1 NO + 2 NC Solenoid: 1 NO + 2 NC	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.	
V				Order No.	Price \$ per PU			kg	
2600 N locking force · Enclosure width 54 mm									
 3SE5 312-0SD1.	Spring-actuated locks								
	• With auxiliary release	--	24 DC	⊕ ▶	3SE5 312-0SD11	1	1 unit	102	1.030
		--	115 AC	⊕ ▶	3SE5 312-0SD12	1	1 unit	102	1.030
		--	230 AC	⊕ B	3SE5 312-0SD13	1	1 unit	102	1.030
	Yellow/Green	24 DC	⊕ B	3SE5 312-1SD11	1	1 unit	102	1.040	
	Yellow/Green	115 AC	⊕ ▶	3SE5 312-2SD12	1	1 unit	102	1.040	
 3SE5 312-0SE1.	Yellow/Green	230 AC	⊕ B	3SE5 312-3SD13	1	1 unit	102	1.040	
	• With auxiliary release	--	24 DC	⊕ B	3SE5 312-0SE11	1	1 unit	102	1.180
	With lock	--	115 AC	⊕ B	3SE5 312-0SE12	1	1 unit	102	1.180
		--	230 AC	⊕ B	3SE5 312-0SE13	1	1 unit	102	1.180
		--	48 AC/DC	⊕ C	3SE5 312-0SE14	1	1 unit	102	1.180
	Yellow/Green	24 DC	⊕ B	3SE5 312-1SE11	1	1 unit	102	1.180	
 3SE5 312-0SF1.	Yellow/Green	115 AC	⊕ B	3SE5 312-2SE12	1	1 unit	102	1.180	
	Yellow/Green	230 AC	⊕ B	3SE5 312-3SE13	1	1 unit	102	1.180	
	• With escape release	--	24 DC	⊕ B	3SE5 312-0SF11	1	1 unit	102	1.180
	from the front	--	115 AC	⊕ B	3SE5 312-0SF12	1	1 unit	102	1.180
		--	230 AC	⊕ B	3SE5 312-0SF13	1	1 unit	102	1.180
	Yellow/Green	24 DC	⊕ B	3SE5 312-1SF11	1	1 unit	102	1.180	
 3SE5 312-0SG1.	Yellow/Green	115 AC	⊕ B	3SE5 312-2SF12	1	1 unit	102	1.180	
	Yellow/Green	230 AC	⊕ B	3SE5 312-3SF13	1	1 unit	102	1.180	
	• With escape release	--	24 DC	⊕ B	3SE5 312-0SG11	1	1 unit	102	1.175
	from the back	--	115 AC	⊕ B	3SE5 312-0SG12	1	1 unit	102	1.175
	and auxiliary release	--	230 AC	⊕ B	3SE5 312-0SG13	1	1 unit	102	1.175
	from the front	Yellow/Green	24 DC	⊕ ▶	3SE5 312-1SG11	1	1 unit	102	1.180
 3SE5 312-0SJ1.	Yellow/Green	115 AC	⊕ B	3SE5 312-2SG12	1	1 unit	102	1.180	
	Yellow/Green	230 AC	⊕ B	3SE5 312-3SG13	1	1 unit	102	1.180	
	• With escape release	--	24 DC	⊕ B	3SE5 312-0SH11	1	1 unit	102	1.180
	from the back	--	115 AC	⊕ B	3SE5 312-0SJ11	1	1 unit	102	1.180
	and auxiliary release	--	230 AC	⊕ B	3SE5 312-0SJ12	1	1 unit	102	1.180
	with lock from the front	--	230 AC	⊕ B	3SE5 312-0SJ13	1	1 unit	102	1.180
 3SE5 312-0SB1.	Yellow/Green	24 DC	⊕ B	3SE5 312-1SJ11	1	1 unit	102	1.180	
	Yellow/Green	115 AC	⊕ B	3SE5 312-2SJ12	1	1 unit	102	1.180	
	Yellow/Green	230 AC	⊕ B	3SE5 312-3SJ13	1	1 unit	102	1.180	
	Magnetic field locks	--	24 DC	⊕ ▶	3SE5 312-0SB11	1	1 unit	102	1.030
		--	115 AC	⊕ B	3SE5 312-0SB12	1	1 unit	102	1.030
		--	230 AC	⊕ B	3SE5 312-0SB13	1	1 unit	102	1.030
	Yellow/Green	24 DC	⊕ B	3SE5 312-1SB11	1	1 unit	102	1.040	
	Yellow/Green	115 AC	⊕ B	3SE5 312-2SB12	1	1 unit	102	1.040	
	Yellow/Green	230 AC	⊕ B	3SE5 312-3SB13	1	1 unit	102	1.040	

⊙ Positive opening according to IEC 60947-5-1, Appendix K.

1) Supplied without actuator. Please order separately (see page 13/97).

For 1/2" NPT adaptors and cable glands, see page 13/48.

Mechanical Safety

SIRIUS 3SE5 Interlock Switches

3SE5, metal and plastic enclosures Accessories

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Selection and ordering data

Version	DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Actuators for 3SE5 ¹⁾							
 3SE5 000-0AV01		Standard actuators, length 75.6 mm	A	3SE5 000-0AV01	1	1 unit	102 0.040
 3SE5 000-0AV02		With vertical fixing, length 53 mm	A	3SE5 000-0AV02	1	1 unit	102 0.070
 3SE5 000-0AV03		With transverse fixing, length 47 mm	A	3SE5 000-0AV03	1	1 unit	102 0.070
 3SE5 000-0AV04		Radius actuators, length 51 mm • Direction of approach from the left • Direction of approach from the right	A A	3SE5 000-0AV04 3SE5 000-0AV06	1 1	1 unit 1 unit	102 0.070 102 0.070
 3SE5 000-0AV05		Universal radius actuators, • Length 77 mm • Length 77 mm, tab rotated 90°	A A	3SE5 000-0AV05 3SE5 000-0AV05-1AA6	1 1	1 unit 1 unit	102 0.090 102 0.090
 3SE5 000-0AV07		Universal radius actuators, heavy-duty • Length 67 mm • Length 77 mm	A A	3SE5 000-0AV07-1AK2 3SE5 000-0AV07	1 1	1 unit 1 unit	102 0.120 102 0.090
Optional accessories for 3SE5							
 3SE5 000-0AV08-1AA2		Protective caps made of black rubber for the actuator head, to protect the actuator openings from contamination	B	3SE5 000-0AV08-1AA2	1	1 unit	102 0.010
 3SE5 000-0AV08-1AA3		Blocking inserts , high-grade steel, for actuator head, for up to 8 padlocks	B	3SE5 000-0AV08-1AA3	1	1 unit	102 0.065
Connections for 3SE5, 3SE2							
 3SY3 127		Connector sockets (4-pole), M12, fixed for M20 x 1.5 For max. 250 V, 4 A With 0.25 mm ² connecting cable, plastic, degree of protection IP67, ambient temperature -40 to +85 °C	B	3SY3 127	1	1 unit	102 0.010
 3RX8 000		Cable boxes (4-pole), M12, non-adjustable With terminal compartment, can be pre-assembled	A	3RX8 000-0CB45	1	1 unit	574 0.015
		Angular cable boxes (4-pole), M12 With terminal compartment, can be pre-assembled	A	3RX8 000-0CC45	1	1 unit	574 0.015
 3SX9 926		Connector sockets (5-pole), M12 for M20 x 1.5 For max. 125 V, 4 A With 0.25 mm ² connecting cable, plastic, degree of protection IP67, ambient temperature -40 to +85 °C	B	3SY3 128	1	1 unit	102 0.010
		Cable boxes (5-pole), M12 With terminal compartment, can be pre-assembled	A	3RX8 000-0CB55	1	1 unit	574 0.016
		Angular cable boxes (5-pole), M12 With terminal compartment, can be pre-assembled	A	3RX8 000-0CC55	1	1 unit	574 0.016
		Cable glands M20 x 1.5 Plastic	A	3SX9 926	1	1 unit	102 0.010

1) See page 13/90 for dimensions drawings.

Limit Switches

SIRIUS 3SE5 Interlock Switches

3SE5 / 3SE2 with solenoid locking

Technical specifications

Type		3SE5 322	3SE5 312	3SE2 83, 3SE2 84
General data				
Standards		IEC 60947-5-1, EN 60947-5-1		
Rated insulation voltage U_i	V	250		
Degree of pollution acc. to EN 60664-1		Class 3		
Rated impulse withstand voltage U_{imp}	kV	4		6
Rated operational voltage U_e				
• DC	V	24		24
• AC 50/60 Hz	V	230		110 ... 130 230
Conventional thermal current I_{th}	A	6		10
Rated operational current I_e				
• With alternating current 50/60 Hz		I_e / AC-15 or B300		I_e / AC-12 I_e / AC-15
- At 24 V	A	6		10 4
- At 120 V	A	3		10 4
- At 230 V	A	1.5		10 4
• For direct current		I_e / DC-13 or Q300		I_e / DC-12 I_e / DC-13
- At 24 V	A	3		10 3
- At 60 V		--		5 1.5
- At 110 V		--		2.5 0.7
- At 125 V	A	0.55		-- --
- At 220 V		--		1 0.3
- At 250 V	A	0.27		-- --
Magnet				
• Locking force, max.	N	1300	2600	1820
• Locking force acc. to GS-ET 19	N	1000	2000	1400
• Power consumption at U_c	W	3.5		5.2
Short-circuit protection¹⁾				
• With DIAZED fuse links, operational class gG	A	6		6
• Characteristic quick		--		10
• With miniature circuit breaker, Char. C	A	0.5		--
Mechanical endurance		1 × 10 ⁶ operating cycles		1 × 10 ⁶ operating cycles
Electrical endurance				
• With 3RH11, 3RT10 16 to 3RT10 26 contactors		1 × 10 ⁶ operating cycles		1 × 10 ⁶ operating cycles
• For AC-15 utilization category		1 × 10 ⁵ operating cycles, when interrupting I_e / AC-15 at 230 V		0.5 × 10 ⁶ operating cycles, when interrupting I_e / AC-15 at 230 V
• For DC-13 utilization category		With DC current the contact endurance depends not only on the breaking current but also on the voltage, the circuit inductance and the speed of switching. No generally valid information can be given.		
Switching frequency With 3RH11, 3RT10 16 to 3RT10 26 contactors		6 × 10 ³ operating cycles/h		
Shock resistance acc. to IEC 60068-2-27		30 g/11 ms		--

Type		3SE5 322	3SE5 312	3SE2 83, 3SE2 84
Enclosure				
Enclosure material		Ultramid A3X2G7	Zinc diecasting GD Zn Al4 Cu1	Aluminum (GD - AlSi 12)
Degree of protection	acc. to EN 60529	IP66/IP67		IP67
Ambient temperature				
• During operation	°C	-25 ... +60		-30 ... +70
• During storage, transport	°C	-40 ... +80		--
Mounting position		Any		
Connection				
Cable entry		M 20 × 1.5		M 20 × 1.5
Conductor cross-sections				
• Solid	mm²	1 × (0.5 ... 1.5)		2 × 2.5
• Finely stranded with end sleeve	mm²	2 × (0.5 ... 0.75)		2 × 1.5
Protective conductor connection		--	M3.5	
Inside enclosure				

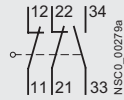
¹⁾ Without any welds according to IEC 60947-5-1.

Schematics

3SE5

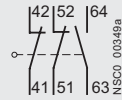
Monitoring the actuator:

Slow-action contacts 1 NO + 2 NC



Monitoring the solenoid:

Slow-action contacts 1 NO + 2 NC



Configuration

Operation and operating travel of actuators

Operation by a separate actuator

- ⊕ Positive opening acc. to EN 60947-5-1
- V_{max} Max. actuating speed
- Direction of operation

Contact blocks

Terminal designation acc. to EN 50013

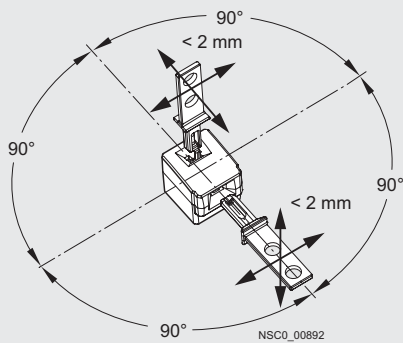
Nominal travel

- Contact closed
- Contact open
- Actuator in actuator head: NC is closed

Separate actuators with solenoid interlocking

Standard actuators

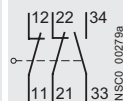
Axial and lateral actuation ($4 \times 90^\circ$)



Minimum force required in operating direction 30 N (on retraction)

Slow-action contacts

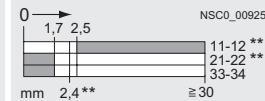
1 NO + 2 NC



Ident. No. 12

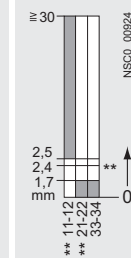
Lateral actuation

3SE5 3...-S...



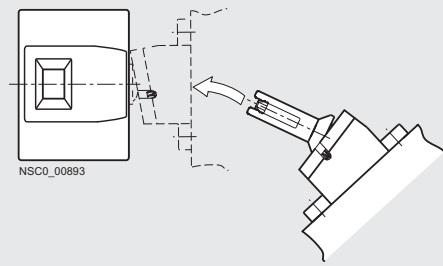
Axial actuation

3SE5 3...-S...



Radius actuators (all directions of approach)

Example: Direction of approach from the left



For connector socket assignment, see page 13/61.

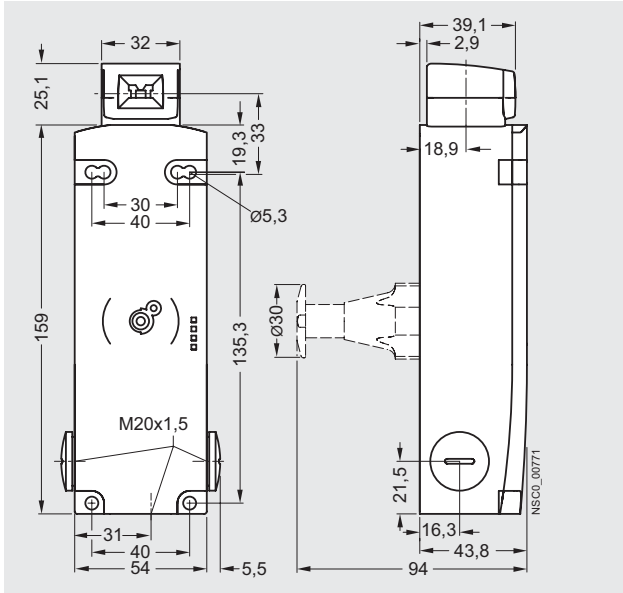
Limit Switches

SIRIUS 3SE5 Interlock Switches

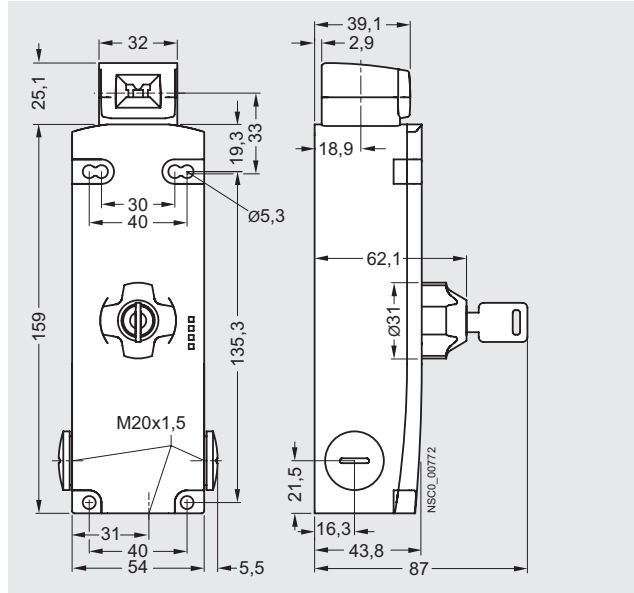
3SE5 with solenoid locking
Metal and plastic enclosures

Dimensional drawings

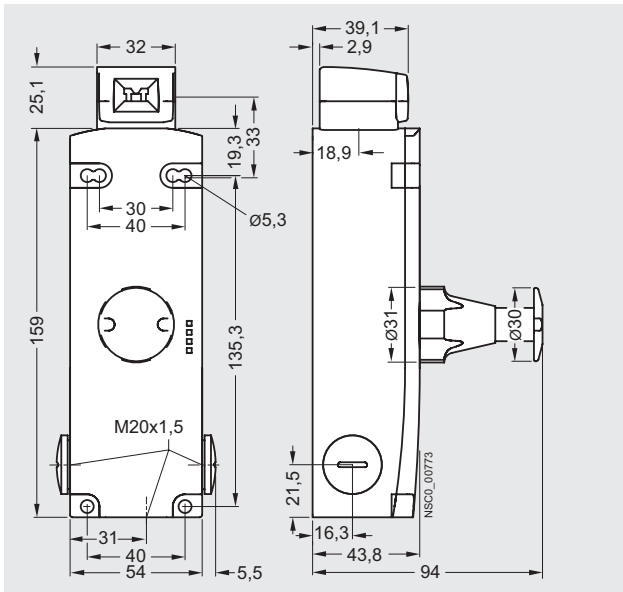
Spring-actuated lock, with auxiliary release
3SE5 322-SD2., 3SE5 322-SG2., 3SE5 322-SJ2.,
3SE5 312-SD1., 3SE5 312-SG1., 3SE5 312-SJ1.,



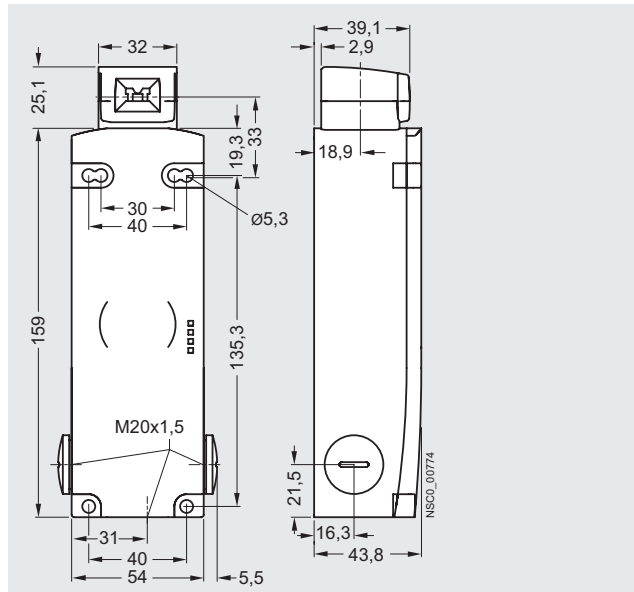
Spring-actuated lock, with auxiliary release with lock
3SE5 322-SE2.,
3SE5 312-SE1.



Spring-actuated lock, with escape release
3SE5 322-SF2.,
3SE5 312-SF1.



Magnetic field lock
3SE5 322-SB2.,
3SE5 312-SB1.



The plastic enclosures have knock-out openings behind the connecting thread; they are delivered therefore without protective caps.

For actuators see page 13/90.

Overview

3SE5 hinge switches have the same enclosures as the standard switches (modular system).



Hinge switches

Design

Enclosure sizes

The 3SE5 switches are available as complete units in two enclosure sizes:

- Plastic enclosures according to EN 50047, 31 mm wide, IP65, 1 cable entry
- Metal enclosures according to EN 50047, 31 mm wide, IP66/IP67, 1 cable entry
- Plastic and metal enclosures according to EN 50041, 40 mm wide, IP66/IP67, 1 cable entry

Enclosure versions

Various basic versions can be selected for the enclosures:

- Available with two or three-pole contact blocks designed as snap-action contacts
- Metal enclosures for explosion protection (ATEX) ([see online](#))
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs ([see online](#))

For a description of the basic switches, [see page 13/6](#).

Operating mechanism

The hinge switches are provided for mounting on hinges. The actuator head is included in the scope of supply. There are two versions:

- Operating mechanism with hollow shaft, inner diameter 8 mm, outer 12 mm
- Operating mechanism with solid shaft, diameter 10 mm

Benefits

The 3SE5 hinge switches differ from the previous series through the following new characteristics:

- All actuators can be turned around the axis in increments of 22.5° ([see picture on page 13/6](#)).
- The new three-pole contact block 1 NO + 2 NC is available for all enclosure sizes ([see picture on page 13/7](#)).
- The plastic enclosure with a width of 31 mm has simple and fast wiring equipment which makes it possible to save from approx. 20 to 25 % of the time when connecting ([see picture on page 13/7](#)).
- The ASIsafe electric component is integrated for the versions with the AS-Interface connection ([see online](#)); an additional adapter is not required.

Application

The hinge switches are used in those areas where the position of swiveling protective devices such as doors or flaps must be monitored. With these switches, the position of the doors and hinge switches is converted into electric signals. The switches allow shutdown and signaling without delay in the event of a small opening angle through the snap-action contacts with an operating angle of 10°.

Devices are available with enclosure versions to suit the particular ambient conditions. Different control tasks can be performed with the best contact blocks suited for the particular purpose. Dimensions and fixing points of the enclosures are in accordance with EN 50041 or EN 50047 standards.

The devices are suitable for use in any climate.

Standards


IEC 60947-5-1 or EN 60947-5-1.


The protective measure of "total insulation" by the molded-plastic enclosure is guaranteed by the use of molded-plastic screw-glands.

Safety position switches

For controls according to IEC 60204-1 or EN 60204-1 the devices can be used as a safety position switch. To secure position switches against changes in their position, keyed techniques must be employed on installation.

Safety circuits

IEC 60947-5-1 and EN 60947-5-1 require positive opening of the NC contacts, i.e. for the purposes of personal safety, the assured opening of NC contacts is expressly stipulated for the electrical equipment of machines in all safety circuits and marked according to IEC 60947-5-1 with the symbol .

Category 4 according to EN 954-1 can be attained with the 3SE5 hinge switches with  if the corresponding failsafe evaluation units are selected and correctly installed, e.g. the 3TK28 safety relays or matching devices from the ASIsafe, SIMATIC or SINUMERIK product ranges.

Mechanical Safety

SIRIUS 3SE5 Hinge Switches

3SE5, plastic enclosures
Enclosure width 31 mm / 40 mm

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP65 (31 mm) or IP67/IP68 (40 mm) · Cable entry M20 × 1.5

Version	Snap-action contacts	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*
			Configurator			
			Order No.	Price per PU		

Plastic enclosures · Enclosure width 31 mm acc. to EN 50047



With hollow shaft

With hollow shaft

Operating angle 10°

1 NO + 1 NC



B

3SE5 232-0HU21

1

1 unit

Operating angle 10°

1 NO + 2 NC



B

3SE5 232-0LU21

1

1 unit



With solid shaft

With solid shaft

Operating angle 10°

1 NO + 1 NC



B

3SE5 232-0HU22

1

1 unit

Operating angle 10°

1 NO + 2 NC



B

3SE5 232-0LU22

1

1 unit

Plastic enclosures · Enclosure width 40 mm acc. to EN 50041



With hollow shaft

With hollow shaft

Operating angle 10°

1 NO + 2 NC



B

3SE5 132-0LU21

1

1 unit



With solid shaft

With solid shaft

Operating angle 10°

1 NO + 2 NC



B

3SE5 132-0LU22

1

1 unit

For online configurator see www.siemens.com/sirius/configurators.

Positive opening according to IEC 60947-5-1, Appendix K.

Spare parts

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
---------	----	-----------	-----------------	-------------------------	-----

Actuator heads



With hollow shaft

With hollow shaft

Operating angle 10°

B

3SE5 000-0AU21

1

1 unit



With solid shaft

With solid shaft

Operating angle 10°

B

3SE5 000-0AU22

1

1 unit

Note:

The respective actuators are included in the scope of supply for the complete units.

Mechanical Safety

SIRIUS 3SE5 Hinge Switches

3SE5, metal enclosures
Enclosure width 31 mm / 40 mm

Selection and ordering data

Complete units

3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Snap-action contacts	DT	Complete units	PU (UNIT, SET, M)
			Configurator	
			Order No.	Price per PU

Metal enclosures · Enclosure width 31 mm acc. to EN 50047



With hollow shaft

With hollow shaft

Operating angle 10°

1 NO + 2 NC

⊕ B

3SE5 212-0LU21

1



With solid shaft

With solid shaft

Operating angle 10°

1 NO + 2 NC

⊕ B

3SE5 212-0LU22

1

Metal enclosures · Enclosure width 40 mm acc. to EN 50041



With hollow shaft

With hollow shaft

Operating angle 10°

1 NO + 2 NC

⊕ B

3SE5 112-0LU21

1



With solid shaft

With solid shaft

Operating angle 10°

1 NO + 2 NC

⊕ B

3SE5 112-0LU22

1

For online configurator see www.siemens.com/sirius/configurators.

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

Spare parts

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
---------	----	-----------	--------------	-------------------	-----

Actuator heads



With hollow shaft

With hollow shaft

Operating angle 10°

B

3SE5 000-0AU21

1

1 unit



With solid shaft

With solid shaft

Operating angle 10°

B

3SE5 000-0AU22

1

1 unit

Note:

The respective actuators are included in the scope of supply for the complete units.

3SE2 Hinge Switches

3SE2, plastic enclosures with integrated hinge

Overview

The 3SE2 283 hinge switches are particularly suitable for use in doors and flaps of machines that must be closed to ensure the safety of operating personnel. Their thin profile and compact design allow them to be directly mounted on a hinged protective cover and the stable frame.

Benefits

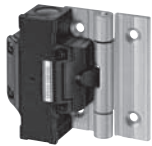
- Easy mounting through use of versions with integrated hinge
- Versions with small operating angle of 4°
- Protection against personal injury provided by positively driven NC contacts according to IEC 60947-5-1
- Simultaneous shutdown and reporting by 1 NO + 2 NC contacts

Selection and ordering data

3 contacts · Degree of protection IP65 · Cable entry 2 × (M20 × 1.5)

Version	Slow-action contacts	DT	Complete units	<input type="checkbox"/>	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
			Order No.	List Price \$ per PU				kg

Plastic enclosures with integrated hinge



3SE2 283

With mounted hinges
(delivered with additional hinge and fixing accessories)

- Aluminum hinge

- Operating angle 4°	1 NO + 2 NC	⊙ A
- Operating angle 4°	3 NC	⊙ A
- Operating angle 8°	1 NO + 2 NC	⊙ D
- Operating angle 8°	3 NC	⊙ C

- High-grade steel hinge

- Operating angle 4°	1 NO + 2 NC	⊙ A
- Operating angle 4°	3 NC	⊙ C

3SE2 283-0GA43	1	1 unit	102	0.425
3SE2 283-6GA43	1	1 unit	102	0.425
3SE2 283-0GA53	1	1 unit	102	0.420
3SE2 283-6GA53	1	1 unit	102	0.420
3SE2 283-0GA44	1	1 unit	102	0.800
3SE2 283-6GA44	1	1 unit	102	0.800

⊙ Positive opening according to IEC 60947-5-1, Appendix K.

Accessories/spare parts

Version	DT	Order No.	List Price \$ per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
							kg

Accessories



3SX3 225

Additional hinges
(delivered with fixing accessories)

- Made of aluminum
- Made of high-grade steel

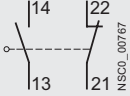
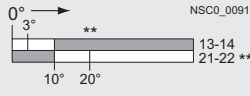
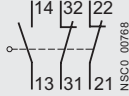
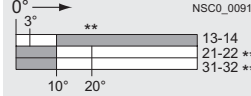
⊙ D	3SX3 225
⊙ D	3SX3 231

1	1 unit	102	0.160
1	1 unit	102	0.330

For 1/2" NPT adaptors and cable glands, see page 13/48.

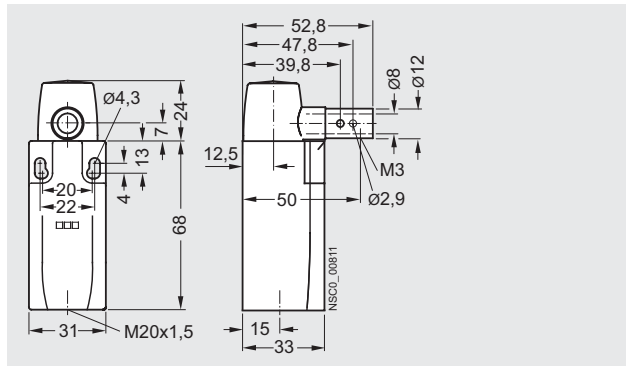
Configuration

Contact blocks and operating travel of actuators

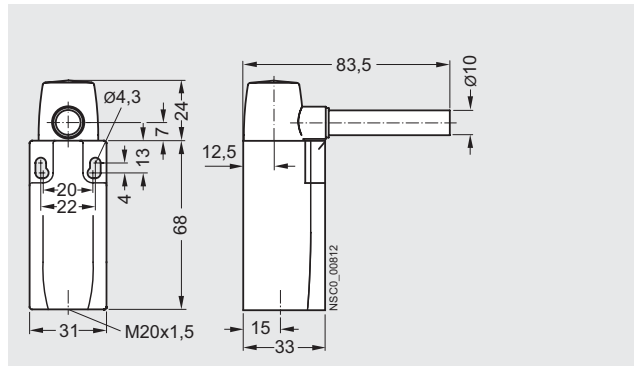
Contact blocks	Nominal travel	Contact blocks	Nominal travel
Terminal designation acc. to EN 50013	<div style="display: flex; align-items: center;"> <div style="width: 10px; height: 10px; background-color: gray; margin-right: 5px;"></div> <div> Contact closed <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> Contact open </div> </div>	Terminal designation acc. to EN 50013	
Hinge switches		Snap-action contacts	
1 NO + 1 NC  Ident. No. 11	3SE5 ...-0HU2. 	1 NO + 2 NC  Ident. No. 12	3SE5 ...-0LU2. 

Dimensional drawings

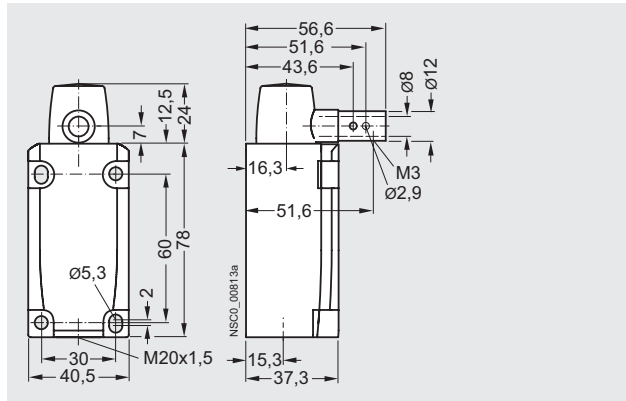
Enclosure width 31 mm
with hollow shaft
3SE5 212-0.U21, 3SE5 232-0.U21



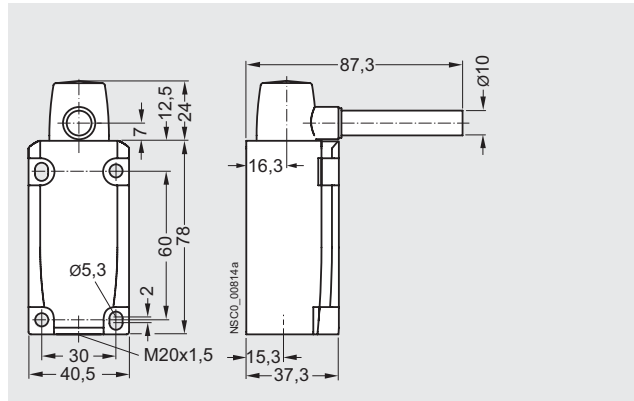
Enclosure width 31 mm
with solid shaft
3SE5 212-0.U22, 3SE5 232-0.U22



Enclosure width 40 mm
with hollow shaft
3SE5 112-0.U21, 3SE5 132-0.U21



Enclosure width 40 mm
with solid shaft
3SE5 112-0.U22, 3SE5 132-0.U22



3SE2 Hinge Switches

3SE2, plastic enclosures
with integrated hinge

Overview

The hinge switches are used for monitoring and protecting hinged protective devices such as doors and flaps.

Characteristics

- Special design, with 2 × M20 × 1.5 connecting thread
- Degree of protection IP65
- 3 contacts
- Operating angle of 4° or 8°

Design

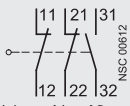
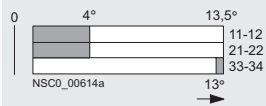
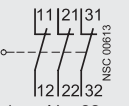
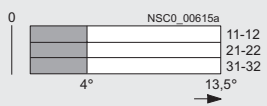
The 3SE2 283 hinge switch has an integrated electromechanical contact block that is actuated when the hinged protective cover is opened. If the cover is opened by 4° or 8°, the NC contact is positively opened by a direct (not spring-action) mechanism. These positively driven contacts guarantee interruption of the electric circuit and stopping of the machine. The NO contact is closed when the cover is moved by 13.5°.

Technical specifications

Type		3SE2 283
Rated insulation voltage U_i	V	250
Conventional thermal current I_{th}	A	2.5
Rated operational current I_e		
• At AC-15, 120 V	A	4.2
• At AC-15, 250 V	A	2
• At DC-13, 24 V	A	1
Min. make-break capacity		> 5 V/1 mA
Short-circuit protection		
• Operational class gG	A	2
Mechanical endurance		> 1 × 10 ⁶ operating cycles
Switching frequency		1200 operating cycles/hour
Positive opening		2 mm after opening point
Enclosure material		Plastic
Degree of protection		IP65
Ambient temperature	°C	-25 ... +65
Shock resistance		30 g/18 ms
Resistance to vibrations		20 g/10 ... 200 Hz
Cable entry		2 × (M20 × 1.5)
Screw terminals		0.5 ... 1.5 mm ² /AWG 15

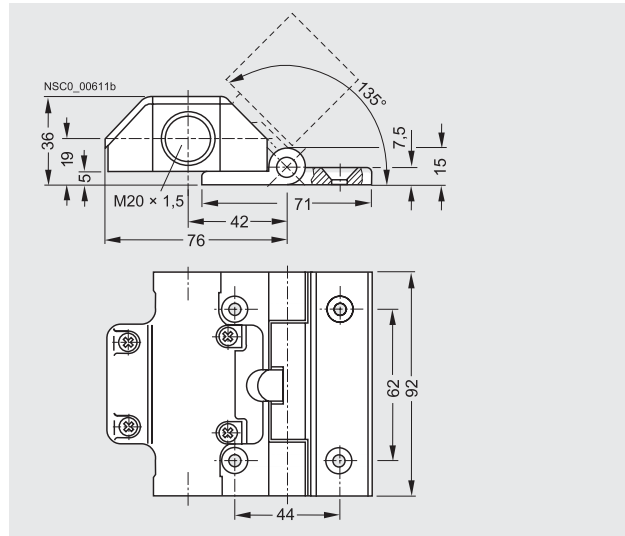
Configuration

Contact blocks and operating travel of actuators (operating angle 4°)

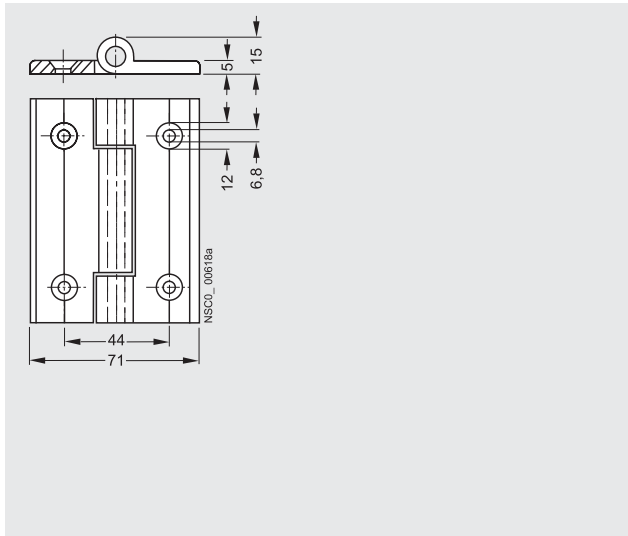
Contact blocks	Nominal travel	Contact blocks	Nominal travel
Terminal designation acc. to EN 50013	<div style="display: flex; align-items: center;"> <div style="width: 10px; height: 10px; background-color: gray; margin-right: 5px;"></div> Contact closed <div style="width: 10px; height: 10px; border: 1px solid gray; margin-left: 10px; margin-right: 5px;"></div> Contact open </div>	Terminal designation acc. to EN 50013	
Hinge switches		Slow-action contacts	
1 NO + 2 NC  Ident. No. 12	3SE2 283-0GA4.  NSC0_00614a	3 NC  Ident. No. 03	3SE2 283-6GA4.  NSC0_00615a

Dimensional drawings

3SE2 283-.GA.3 hinge switch with hinge



3SX3 225 additional hinge



Overview



Non-contact RFID safety switches with maximum tamper resistance

3SE63 RFID contactless safety switches meet the highest safety requirements, SIL3 or Cat. 4, for monitoring the positions of movable protective devices.

An RFID safety switch consists of a coded RFID switch with an 8-pole M12 connector plug and an identical RFID actuator.

The switch is available in several versions:

- Family coded with M12 plug or with additional 18 N magnetic catch as an option
- Individually coded, programmable once, with M12 plug or with additional 18 N magnetic catch as an option
- Individually coded, programmable more than once (an unlimited number of times), with M12 plug or version with additional 18 N magnetic catch

The actuator is therefore available in two versions:

- Standard
- With 18 N magnetic catch

The magnetic catch keeps doors and hinge switches closed with permanent magnets.

Optional accessories

- Covers for sealing mounting holes, also suitable for tamper-proofing screw fixings
- Spacers (approx. 3 mm high) to facilitate cleaning under the installation surface when using pressure washers, for example

Mounting and maintenance

Reduction in the number of versions, because

- switches can be mounted on right or left sides
- the actuator can be mounted on all sides

Quick and easy mounting by thanks to universal mounting holes

- Standard gauge/holes for 3SE6 magnetically operated switch
- Fine adjustment thanks to slotted holes

Little adjustment or maintenance required

- Threshold indication by LED on the switch for quick and easy adjustment during installation and maintenance
- Molded switch allows it to be used as an end stop for small and medium-sized doors

Note:

Keep metal parts and cuttings away from the vicinity of the switch

Minimum distance between two switches 100 mm

Coding

Family coded

These safety switches are delivered ready to use, i.e. no programming is necessary.

Individually coded, programmable once

The assignment of safety switch and actuator thus created is irreversible.

The actuator is programmed simply by routine during startup, thus permanently preventing any form of tampering by means of a replacement actuator.

Individually coded, programmable several times

The procedure for programming a new actuator can be repeated an unlimited number of times. When a new actuator is programmed the previous code becomes invalid. A protected coding process allows new actuators to be programmed for service purposes.

After this, a ten-minute lockout provides enhanced tamper protection. The green LED flashes until the lockout time has ended and the new actuator has been detected. If the operational voltage is interrupted during this time, the ten-minute guard time is restarted.

Programming procedure for individual coding

1. Apply operational voltage to safety sensor
2. Move actuator into detecting range: red LED lights up, yellow LED flashes (1 Hz)
3. After 10 s it changes to a shorter flashing frequency (3 Hz). In this state switch off operational voltage.
4. After the next time the operational voltage is switched on, the actuator is detected again to activate the programmed actuator code. The activated code is thus stored permanently.

Diagnostics

The RFID safety switch indicates its operating state including faults by means of the LED indicator in the switch and the short-circuit resistant diagnostic output. The signals can then be used for central displays or non-safety-related control tasks.

There are two diagnostics functions:

- Crossover monitoring
- Open-circuit monitoring
- External voltage monitoring
- Ambient temperature too high
- Wrong or defective actuator
- Switching interval threshold identification with LED indication

The signal combination "diagnostics output switched off" and "safety outputs still switched on" can be used to move the machine into a controlled stop position.

Any crossover or a fault that is not currently compromising the safe operation of a safety switch results in the disconnection of the safety channels after a 30 minute delay. However, the diagnostics output switches off instantaneously.

Mechanical Safety

SIRIUS 3SE6 RFID Non-Contact Safety Switches

General data

Mode of operation of the diagnostics LEDs

The safety switch indicates not only its operating state, but also faults by means of LEDs in three colors at the ends of the RFID switch.

- The green LED indicates readiness for operation when the control supply voltage is connected.
- The yellow LED indicates that there is an actuator in detecting range. If the actuator is in the switching interval threshold, this is indicated by flashing. This flashing can be used to identify a change in the distance between sensor and actuator at an early stage (e.g. as a result of the sagging of a protective door). The installation should be tested before the distance increases further, the safety outputs switch off and the machine stops.
- The red LED indicates the individual causes of the fault by means of defined flashing frequencies.

Benefits

- Maximum tamper resistance by means of individual coding of switches and actuators at the highest safety level
- Plastic enclosure with integrated connector
- 2 electronic short-circuit proof safety outputs, each 250 mA
- Integrated crossover, open circuit and external voltage monitoring, with series circuit as far as the control cabinet
- Safety and diagnostics signals can be connected in series
- Series connection of safety circuits in Cat. 4 / PL e / SIL 3
- LED status indication including switching interval threshold indication for quick and easy adjustment during installation and maintenance
- Short-circuit proof conventional diagnostics output
- Optional version with magnetic catch for interlocking hatches or small doors even when de-energized

- Highly rugged thanks to the use of tested enclosure materials, resistant to aggressive cleaning products, with a degree of protection of up to IP69K
- Fine adjustment thanks to slotted holes
- Little adjustment or maintenance required
- Molded switch allows it to be used as an end stop for small and medium-sized doors

Application

RFID contactless safety switches are designed for use in safety circuits, and are used to monitor the positions of movable protective devices. They monitor the positions of rotating, laterally sliding or removable protective devices using the coded electronic actuator.

Their high degree of protection (IP69K) and the use of cleaning product-resistant materials means that these switches are optimized for use under extreme environmental conditions.

Their electronic operating principle makes these switches ideal for metalworking machinery.

The switches have a larger switching interval and switching displacement than mechanical switches, improve the mounting tolerance of the protective door, and offer a wide range of diagnostics options.

The RFID switches can be connected to all standard evaluation units, e. g. a PLC, 3TK28 safety evaluation units (in which the built-in crossover monitoring function can be deactivated), or the 3RK3 modular safety system.

The following safety categories can be achieved in safety circuits:

- Category 4 according to EN ISO 13849-1 (EN 954-1)
- PL e according to EN ISO 13849-1
- SIL 3 according to IEC 61508

Technical specifications

Type	3SE6 3	
General data		
Standards	IEC 60947-5-3, IEC 61508, EN ISO 13849-1	
Enclosure material	Fiber-glass strengthened ther- moplast, self-extin- guishing	
Degree of protection	IP69K	
Ambient temperature		
• During operation	°C	-25 ... +70
• During storage, transport	°C	-25 ... +85
Shock resistance	30 g/11 ms	
Vibration resistance	10 ... 55 Hz amplitude 1 mm	
Electrical specifications		
Rated insulation voltage U_i	V	32
Pollution degree acc. to IEC 60664-1		3
Rated impulse withstand voltage U_{imp}	V	800
Rated conditional short-circuit current	A	100
Rated operational voltage U_e (PELV acc. to IEC 60204-1)	V DC	24 –15/+10 %
Protection class	II	
Overvoltage category	III	
Rated operational current I_e	A	0.6
Smallest operational current I_m	mA	0.5
No-load supply current I_0	mA	35

Type	3SE6 3	
Inputs/outputs		
Safety inputs X1/X2		
• Input voltage	V DC	24 – 15/+10 %
• Power consumption per input	mA	5
Safety outputs OSSD1/OSSD2		
		p operation
• Max. rated operational current I_e	A	0.25
• Rated operational current I_e /DC-12/DC-13 at U_e	A	0.25
• Voltage drop U_e	V	< 1
• Switching frequency	Hz	1
• Response time, max.	ms	100
• Risk time, max.	ms	200
• Recovery, max.	s	5
Diagnostics output		
		p operation
• Max. rated operational current $I_{e2\ max}$	A	0.05
• Rated operational current I_e /DC-12/DC-13 at U_e	A	0.05
• Voltage drop U_e	V	< 2
• Operational current	mA	150
• Conductor capacity, max.	nF	50

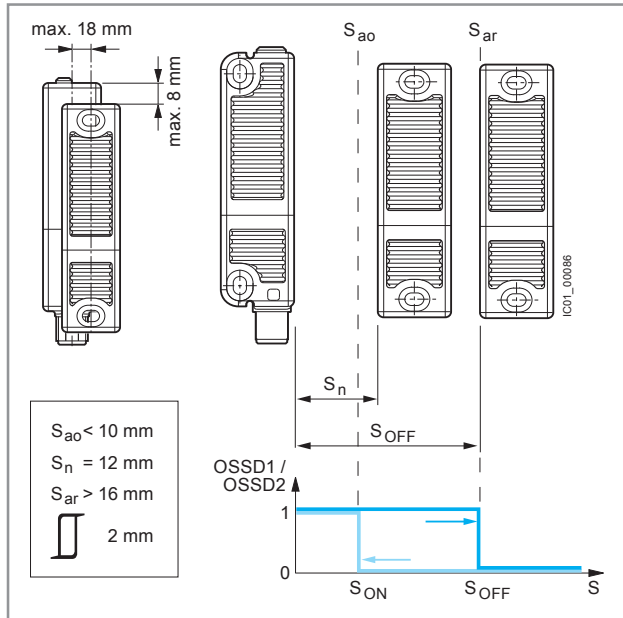
Mechanical Safety

SIRIUS 3SE6 RFID Non-Contact Safety Switches

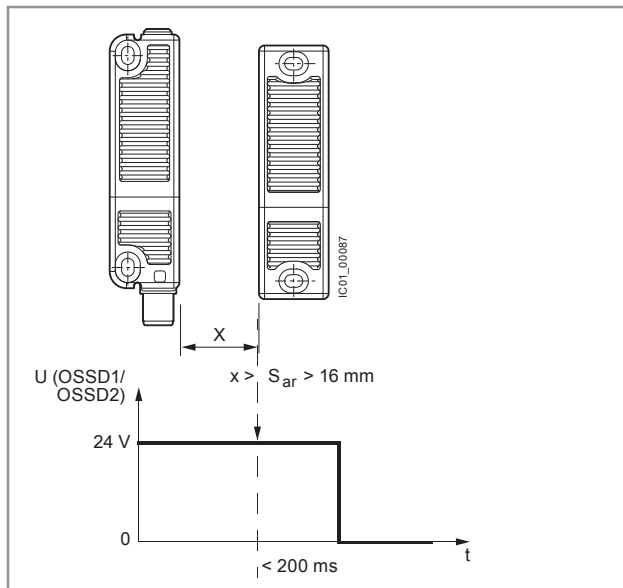
Technical data

Directions of approach and switching interval

The side area permits a maximum height offset of the switch and actuator of ± 8 mm (e.g. mounting tolerance or due to sagging of the protective door). The transverse offset also equals max. ± 8 mm.

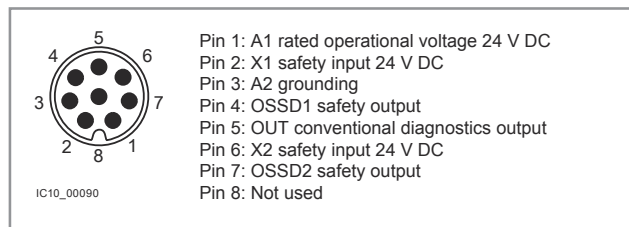


Switching interval: output signal with hysteresis



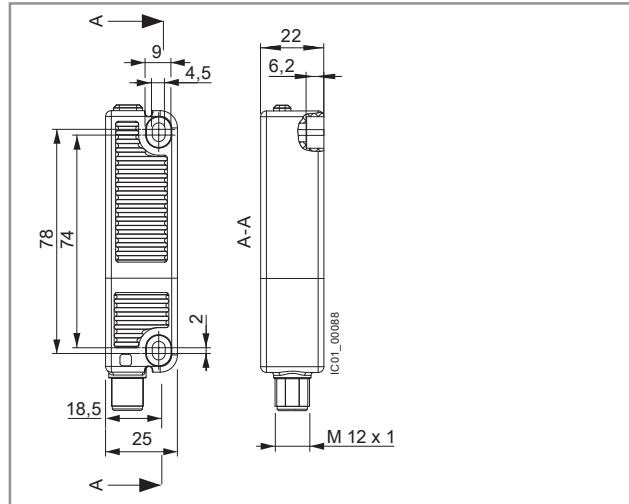
Switching interval: Output signal

Connector assignment

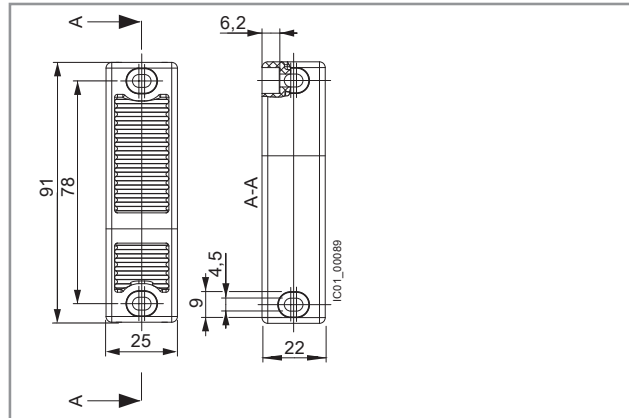


Dimensional drawings

RFID switches 3SE6 315



RFID actuator 3SE6 310





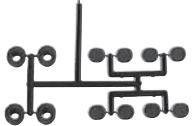

Mechanical Safety

SIRIUS 3SE6 RFID Non-Contact Safety Switches

Selection

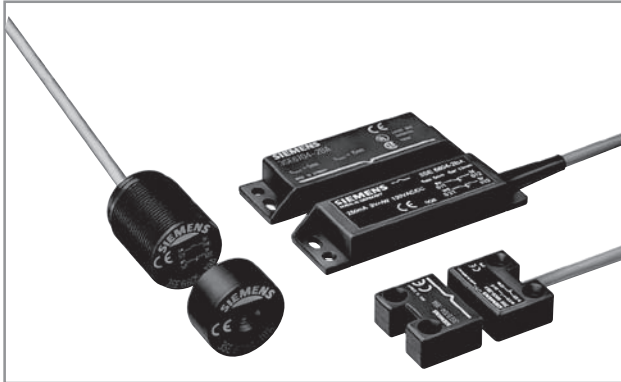
Selection and ordering data

With M12 connector, 8-pole

Version/coding	Latching / length	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
Rectangular safety switches 91 mm x 25 mm						
 3SE6 315	RFID safety switches					
	• Family coded	None	▶ 3SE6 315-0BB01		1	1 unit
		With 18 N magnetic catch	▶ 3SE6 315-1BB01		1	1 unit
	• Individually coded, programmable several times	None	▶ 3SE6 315-0BB02		1	1 unit
		With 18 N magnetic catch	▶ 3SE6 315-1BB02		1	1 unit
	• Individually coded, programmable once	None	▶ 3SE6 315-0BB03		1	1 unit
		With 18 N magnetic catch	▶ 3SE6 315-1BB03		1	1 unit
 3SE6 310	RFID actuators					
	• Standard	None	▶ 3SE6 310-0BC01		1	1 unit
		With 18 N magnetic catch	▶ 3SE6 310-1BC01		1	1 unit
Optional accessories						
 3SX5 600-1G	Covers and spacers		A	3SX5 600-1G	1	1 unit
	One pack (1 unit) contains 8 covers and 4 spacers					
 3SX5 601-2GA	Connecting cables, 8-pole, with 1 straight M12 socket		A	3SX5 601-2GA03	1	1 unit
		Length 3 m				
		Length 5 m	A	3SX5 601-2GA05	1	1 unit
		Length 10 m	A	3SX5 601-2GA10	1	1 unit
	Rated voltage 30 V Rated current 2 A					

For monitoring units see Chapter 14, "Industrial Communication"

Overview

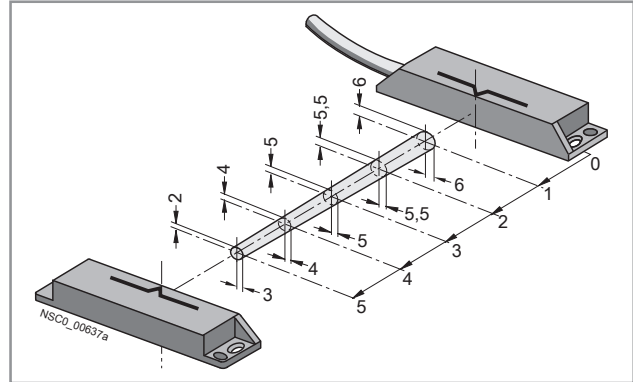


Switching magnets and contact blocks

A magnetically operated switch is comprised of a coded switching magnet and a contact block (sensor unit). Evaluation requires a safety relay or connection to a bus system.

3SE6 806 safety relays

Up to six protective devices (sensors) can be connected to the safety relay.



Enabling range (example)

The device has six current-sourcing semiconductor outputs (Y1 ... Y6) which signal the state of the connected protective devices.

The 3SE6 806 safety relay has two floating enabling circuits (safe circuits) as NO contact circuits and one floating signaling circuit as a NC circuit. The number of enabling circuits can be increased by adding one or more 3TK28 30 expansion modules.

Application

SIRIUS 3SE6 magnetically operated switches are designed for mounting on movable protective guards (hoods, hinge switches, doors, etc.). Evaluation can be performed by means of a safety relay or through connection to a bus system.

The 3SE6 6 non-contact, magnetically operated safety switches stand out due to their enclosed design with degree of protection IP67. They are particularly suitable therefore for areas exposed to contamination, cleaning or disinfecting.

A magnetic monitoring system comprises one or more magnetically operated switches and an evaluation unit, e.g. a safety relay. When contact blocks 1 NO + 1 NC are used the 3SE6 806 safety relay provides a high degree of protection against manipulation and can be installed in safety circuits up to Category 3 according to ISO 13849-1 (EN 954-1).

Combination of monitoring units and magnetically operated switches

Monitoring units		Magnetically operated switches (contact block + switching magnet)					Achievable category (EN 954-1)/ Performance level (EN ISO 13849-1)
		1 NO + 1 NC	2 NC	1 NO + 2 NC			
		3SE6 605-1BA	3SE6 605-2BA	3SE6 605-3BA	3SE6 604-2BA	3SE6 606-3BA	
		3SE6 704-1BA	3SE6 704-2BA	3SE6 704-3BA	3SE6 704-2BA	3SE6 704-3BA	
Relay outputs							
SIRIUS safety relays, 6-fold	3SE6 806-2CD00						Cat. 3
SIRIUS safety relays	3TK28 20 3TK28 26	— ✓	— ✓	— ✓	✓ ✓	— ✓	Cat. 4/e Cat. 4/e
Solid-state outputs							
SIRIUS safety relays	3TK28 40 3TK28 41, 3TK28 42, 3TK28 45	— —	— —	— —	✓ ✓	— —	Cat. 3/d Cat. 4/e
SIRIUS safety relays with contactor relay	3TK28 50, 3TK28 51, 3TK28 52 3TK28 53	— —	— —	— —	✓ ✓	— —	Cat. 3/d Cat. 4/e
ASIsafe compact safety modules	3RK1 205, 3RK1 405	—	—	—	✓	—	Cat. 4
SIMATIC S7-31xF-2 DP or SIMATIC ET 200M	SM 326 F, 24 DI, 24 V DC, SM 326 F, 8 DI, NAMUR	✓	✓	✓	✓	✓	Cat. 4
SIMATIC ET 200S PROFIsafe	4/8 F-DI / 3 F-DO, 24 V DC 4/8 F DI, 24 V DC	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	Cat. 3 Cat. 4
SIMATIC ET 200eco	4/8 F DI, 24 V DC	✓	✓	✓	✓	✓	Cat. 4
SIMATIC ET 200pro	8/16 F-DI, 24 V DC, 4/8 F-DI / 4 F-DO 2 A, 24 V DC, F-Switch	✓	✓	✓	✓	✓	Cat. 4
Modular Safety System	3RK3	✓	✓	✓	✓	✓	Cat. 4/e








✓ Suitable magnetically operated switch

Mechanical Safety

3SE6 Magnetic Monitoring Systems

Selection

Selection and ordering data

		Design	Size	S _{an} ... S _{ab}	Contacts	DT	Order No.	List Price \$ 1 unit	Weight approx. kg
			mm	mm					
Round sensor unit. IP67									
		Switching magnet (coded)	M 30				3SE6 704-1BA		0.035
		Switch block with 3 m cable	M 30	5 to 15	1 NO + 1 NC		3SE6 605-1BA		0.166
		Switch block with M12, 4-pole male receptacle ¹⁾	M 30	5 to 15	1 NO + 1 NC	▶	3SE6 605-1BA02		0.130
Rectangular sensor unit. IP67									
		Switching magnet (coded)	25 × 88			▶	3SE6 704-2BA		0.027
		Switch block with 1 m cable	25 × 88	5 to 15	1 NO + 1 NC 2 NC	▶	3SE6 605-2BA 3SE6 604-2BA		0.165 0.165
		Switch block with M8 male receptacle	25 × 88	5 to 15	1 NO + 1 NC 2 NC		3SE6 605-2BA01 3SE6 604-2BA01		0.040 0.130
		Switching magnet (coded)	25 × 33				3SE6 704-3BA		0.014
		Switch block with 3 m cable	25 × 33	4 to 14	1 NO + 1 NC		3SE6 605-3BA		0.151
		Switch block with 3 m cable	25 × 33	4 to 14	1 NO + 2 NC		3SE6 606-3BA		0.151
Accessories									
		Spacer for rectangular sensor unit	25 × 88				3SX3 260		0.015
		Spacer for rectangular sensor unit	25 × 33				3SX3 261		0.010
							Order No.	List Price \$ 1 unit	Weight approx. kg
							DC V	mm	
Monitoring units									
	3SE6 806-2CD00		24		2 NO / 1 NC	6 1 NO + 1 NC	3SE6 806-2CD00		0.200

1) Pin 1 (S21) + Pin 2 (S22) = Normally Closed; Pin 3 (S13) + Pin 4 (S14) = Normally Open
Typical 4-pole Female Plugs with black 5 meter cable include: 3RX1542 (right-angle) or 3RX1513 (straight plug).

Technical specifications

Magnet Switches

Type	3SE6 60.-1BA 3SE6 60.-2BA	3SE6 60.-3BA
Form	M30, 25 mm x 88 mm	25 mm x 33 mm
Standards	DIN EN 50947-5-3 ³⁾	
Sensing type	Magnetic	
Rated voltage	AC/DC 100 V, 120 V	DC 24 V
Rated current	400 mA	100 mA
Performance	10 VA/W	1 W
Max. switching frequency	5 Hz	
Max. sensing distance $S_{an} \dots S_{ab}$	5 ... 15 mm	4 ... 14 mm
Housing material	Fiber-glass strengthened with glass fiber	
Degree of protection acc. to IEC 60529	IP67	
Permissible ambient temperature	<ul style="list-style-type: none"> Operating Storage 	
Shock resistance	10 g/11ms	
Vibration resistance	10 ... 55 Hz, 1 mm amplitude	
Conductor	Cable LiYY 4 x 0.25 mm ² 3 m length	
Receptacle, male	M12, M8	-
Cable length (max for connecting to monitoring unit)	1000 m	100 m

Magnet Switch Monitoring Unit

Type	3SE6 806-2CD00
Standards	EN ISO 13849-1, EN 1088
Rated control supply voltage U_c	DC 24 V
Rated control supply voltage tolerance	0.85 ... 1.2 x U_s
Rated power (without signal outputs Y1 ... Y6)	3 W
Maximum load current	<ul style="list-style-type: none"> Signaling circuit Y1 ... Y6 Signaling circuit 31, 32
Inputs	6 sensors (1 NO or 1 NC)
Outputs	6 signaling outputs 1 relay output 2 enabling circuits
Response time	<ul style="list-style-type: none"> Automatic start Manual start
Release time	20 ms max.
Recovery time	350 ms
Degree of protection to IEC 60529	IP20
Switching capacity ¹⁾	Release circuits (13, 14 and 23, 24) Continuous current, I_{th} Rated operational current, I_e ²⁾
Short circuit protection	<ul style="list-style-type: none"> Fuse type Duty class - gL(gC) - Quick response
Permissible ambient temperature, T_u	<ul style="list-style-type: none"> Operating Storage

1) Utilization category per DIN VDE 0660, Part 200, IEC 60947-5-1
2) With all release circuits loaded

3) In combination with monitoring unit or AS-Interface.

Mechanical Safety

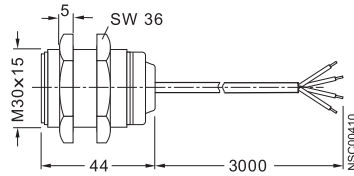
3SE6 Magnetic Monitoring Systems

Dimensional drawings

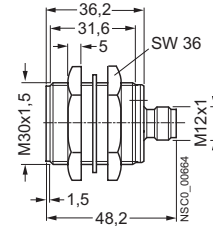
Dimension drawings

Round sensor units

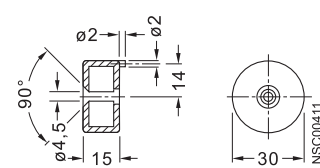
Switch block 3SE6 605-1BA



Switch block 3SE6 605-1BA02

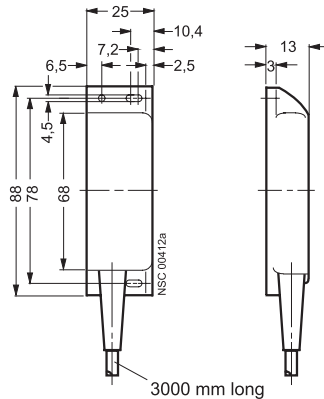


Coded switching magnet 3SE6 704-1BA



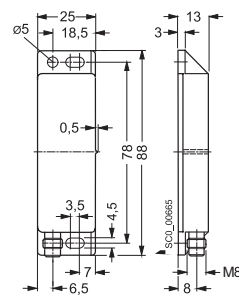
Rectangular sensor units

Switch block 3SE6 605-2BA

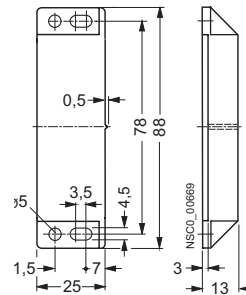


Switching magnet without lead

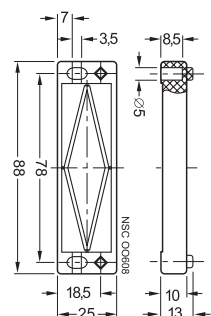
Switch block 3SE6 60-2BA0.



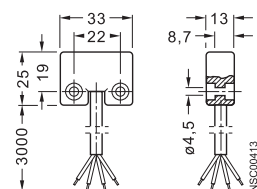
Switch block 3SE7 704-2BA



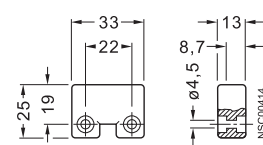
3SX3 260 spacer



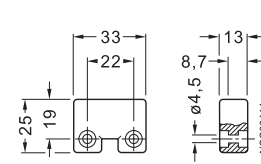
Switch block 3SE6 605-3BA



Coded switching magnet 3SE6 704-3BA

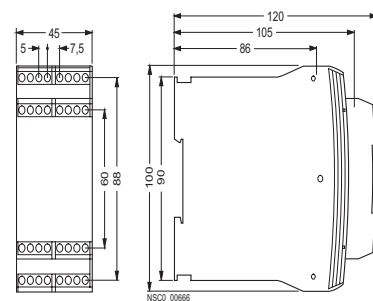


3SX3 261 spacer



Monitoring unit

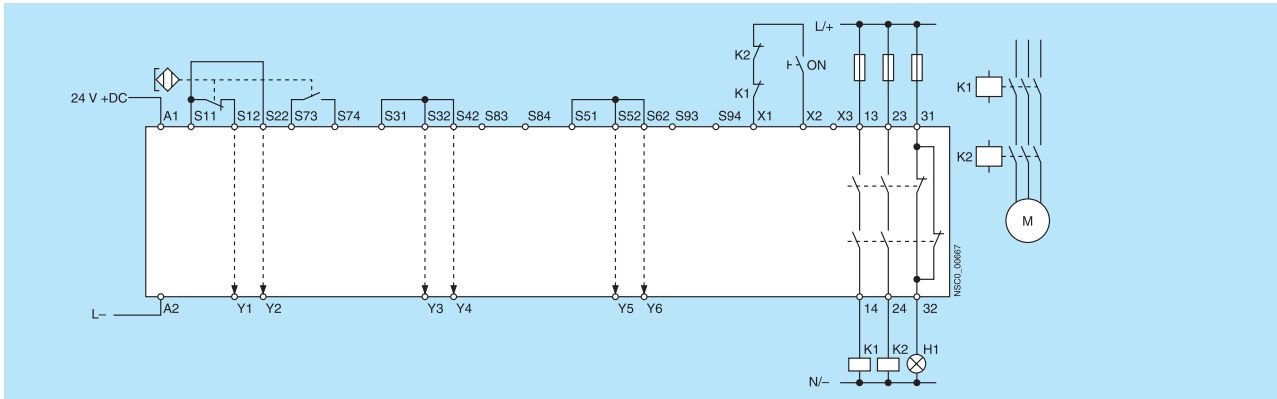
Magnet Switch Monitor 3SE6 806-2CD00



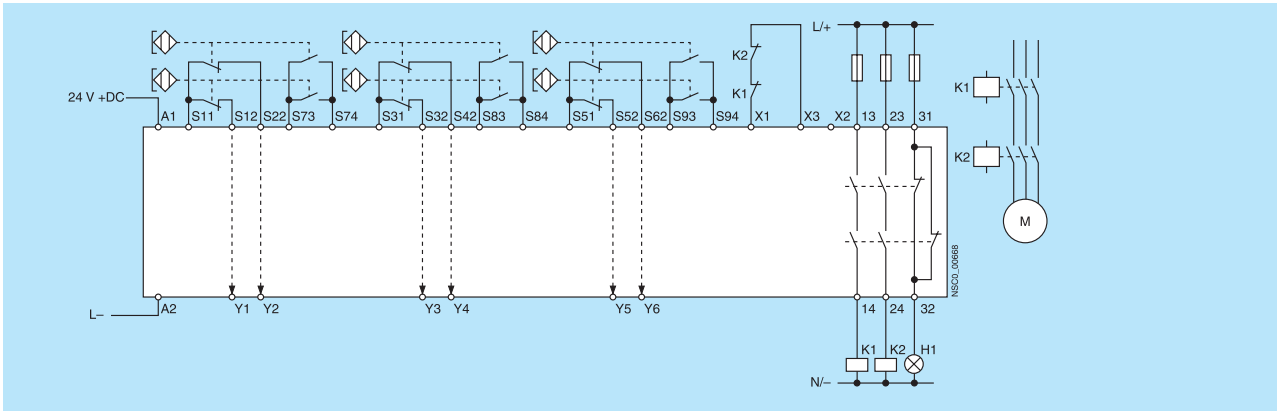
Circuit diagrams

Connection example

Single Channel Control, Manual Start, Category 3 to EN ISO 13849-1



Six Channel Control. Automatic Start, Category 3 to EN ISO 13849-1

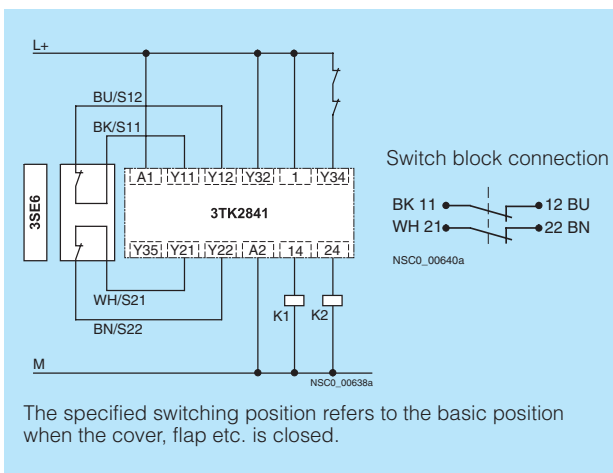


Terminal Assignments

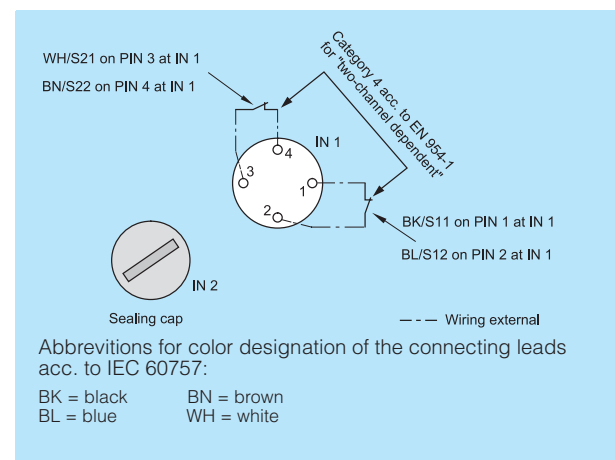
Power	A1+, L+	U _s
	A2-, L-	24 V DC
Sensors	S11, S12	Channel 1, NC contact
	S11, S22	Channel 2, NC contact
	S31, S32	Channel 3, NC contact
	S31, S42	Channel 4, NC contact
	S51, S52	Channel 5, NC contact
	S51, S62	Channel 6, NC contact

Sensors	S73, S74	Channel 1+2, NO contact (parallel)
(Cont.)	S83, S84	Channel 3+4, NO contact (parallel)
	S93, S94	Channel 5+6, NO contact (parallel)
Outputs	13, 14	Release circuit 1 (safety NO contact)
	23, 24	Release circuit 2 (safety NO contact)
	31, 32	Floating signaling circuit
	Y1 to Y6	Status of Channels 1 through 6

3SE6 604-2BA magnetically operated switch with 3TK28 safety relay, Category 4 to EN ISO 13849-1



3SE6 604-2BA magnetically operated switch on AS-Interface Safety at Work, safe K45F or K60F compact module, Category 4 to EN ISO 13849-1



Mechanical Safety

3SB3 Two-Hand Control

Selection

Application

Two-hand operation consoles are required for use with machines and systems that have hazardous areas, in order to direct both hands of the operator to one position.

Operation consoles are primarily used on presses, stamping machines, printing presses and paper converting machines, in the chemical industry and in the rubber and plastics industries.

Specifications

Two-hand operation consoles fulfill the requirements laid down in DIN 24 980 and EN 574.

Construction

Equipment

All consoles are pre-equipped with SIGNUM 3SB3 control devices. The metal version is also available as an unequipped empty enclosure.

The plastic version can be retrofitted with up to 8 command points, in line with the customer's requirements. The surface of the console has premachined breaking points for this purpose.

Installation



The two-hand operation consoles can be mounted either on the stand available or directly on the machine by means of the holes in the rear panel.

Principle of operation

The control command is given by pressing the two operating elements simultaneously (within

0.5 s of each other) and must be maintained for as long as a hazard exists.

Selection and ordering data

	Design	DT	Order No.	List Price \$ 1 unit	Weight approx. kg
	SIGUARD two-hand operation console Degree of protection IP 65, acc. to DIN 24 980 (EN 574), Standard equipment with 2 black operating elements (mushroom button 3SB30 00-1GA11, Ø 40 mm, 1 NO + 1 NC) and a red EMERGENCY-STOP mushroom button 3SB30 00-1HA20, latching Ø 40 mm, 2 NC				
	• Metal version				
	- with standard equipment		3SB38 63-4BB		4.800
	- with standard equipment and 4 additional holes for control devices 22.5 mm		3SB38 63-4BA		4.800
	- empty enclosure, unequipped		3SB38 63-4BC		4.800
	• Plastic version				
	- with standard equipment and predetermined breaking points for 8 further command points 22.5 mm				
	- with cable inlet holes for metric screwed cable glands		3SB38 63-1BB3		2.300
	Stand for SIGUARD two-hand operation consoles				
	• with cable inlet holes for metric screwed cable glands		3SB39 01-0AQ3		4.500

3SB38 63-4BB

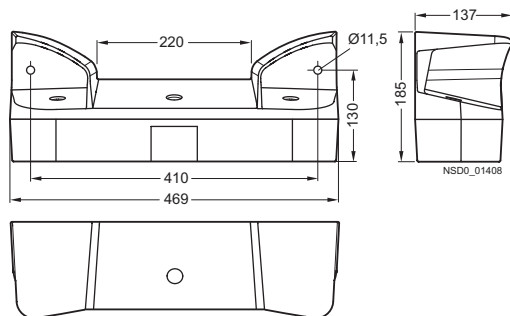


3SB39 01-0AQ

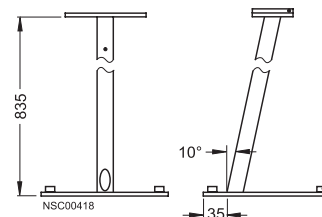


Dimension drawings

3SB38 63-4 operator panel with metal enclosure



3SB39 01-0AQ stand



Note:

Also available with AS-Interface connection, contact your local Siemens representative.

Overview



SIRIUS 3SK1 safety relays

SIRIUS 3SK1 safety relays are the key components of a consistent, cost-effective safety chain. Whether you need EMERGENCY-STOP, protective door monitoring, light arrays, laser scanners or the protection of presses or punches – with the 22.5 mm wide SIRIUS safety relays every safety application can be implemented to optimum effect in terms of engineering and price.

The following safety-oriented functions are available:

- Monitoring the safety functions of sensors
- Monitoring the sensor leads
- Monitoring correct functioning of safety relays
- Monitoring the actuators in the shutdown circuit
- Safety-oriented disconnection when dangers arise

SIRIUS 3SK1 safety relays satisfy the most stringent requirements of IEC 61508/IEC 62061 (SIL 3) and EN ISO 13849-1 (PL e).

SIRIUS 3SK1 safety relays stand out due to their flexibility in both parameterization and system configurations with several evaluation units. Optimized solutions when selecting components are facilitated by a clearly structured component range:

- Standard basic units
- Advanced basic units
- Output expansions
- Input expansions
- Accessories

The 3SK1 Standard basic units are characterized by the following features:

- Compact design
- Simple operation
- Relay and semiconductor outputs
- Economical solution

However, the 3SK1 Advanced basic units also offer the following:

- Universal application options thanks to multi-functionality
- Time-delayed outputs
- Expansion of inputs and outputs

In the case of Advanced basic units, the 3ZY1 device connector allows safety functions involving several sensors and actuators to be constructed very quickly.

The 3SK1 Standard and Advanced series are a high-quality replacement for the 3TK28 safety relays. In their slimmer design, and equipped with greater functionality, they can replace every 3TK28 device. The only exceptions are devices with special functions, such as 3TK28 26, 3TK28 45 and the 3TK28 10 devices. For a code conversion table from 3TK28 to 3SK1 [see page 13/127](#)

Safety Relays

SIRIUS 3SK1

General Data

Function overview of the 3SK1 series

Type	Standard basic units		Advanced basic units	
	Relay enabling circuits	Solid-state enabling circuits	Relay enabling circuits	Solid-state enabling circuits
Sensors				
• Mechanical	✓	✓	✓	✓
• Non-floating	✓	✓	✓	✓
• Antivalent	--	--	✓	✓
• Expandable	--	✓ by means of cascading	✓	✓
Parameters				
• Start (auto/monitored)	✓	✓	✓	✓
• Sensor connection 2 x 1-channel/ 1 x 2-channel	--	✓	✓	✓
• Cross-circuit detection	✓ by means of wiring	✓	✓	✓
• Start-up test ON/OFF	--	✓	✓	✓
• Monitoring of two-hand operation consoles	--	--	✓	✓
Enabling circuits				
• Instantaneous	✓	✓	✓	✓
• Delayed	--	--	✓	✓
• Expandable with relay enabling circuits	✓ by means of wiring	✓ by means of wiring	✓	✓
• Device connectors	--	--	✓	✓
Rated control supply voltage				
• 24 V DC	✓	✓	✓ ¹⁾	✓ ¹⁾
• 115 ... 240 V AC/DC	✓	--	✓ ¹⁾	✓ ¹⁾

✓ Available

-- Not available

¹⁾ Possible using 3SK1 230 power supply via device connector.

3SK1 12 and 3SK1 112 safety relays with DIP switch

The 3SK1 12 and 3SK1 112 safety relays are configurable safety relays. They are used as evaluation units for the typical safety chain (detecting, evaluating, disconnecting). DIP switches on the front can be used to set many different functions. Thus the 3SK1 12 and 3SK1 112 can be used universally.

OFF	Diagram	DIP switch No.	ON
Autostart sensor input		1	Monitored start sensor input
Without cross-circuit detection		2	With cross-circuit detection
2 x single-channel sensor connection		3	1 x two-channel sensor connection
With start-up test		4	Without start-up test

Number of safe outputs

	Relay enabling circuits		Solid-state enabling circuits		3ZY1 device connectors
	Instantaneous	Delayed	Instantaneous	Delayed	
3SK1 Standard basic units					
3SK1 111	3	--	--	--	--
3SK1 112	--	--	2	--	--
3SK1 Advanced basic units					
3SK1 120	--	--	1	--	✓
3SK1 121-.AB40	3	--	--	--	✓
3SK1 121-.CB4.	2	2	--	--	✓
3SK1 122-.AB40	--	--	3	--	✓
3SK1 122-.CB4.	--	--	2	2	✓
3SK1 expansion units					
3SK1 211	4	--	--	--	✓
3SK1 213	3	--	--	--	✓

✓ Available

-- Not available

Order No. scheme

Digit of the Order No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	
	□□□	□	□	□	□	–	□	A	□	□	□
Safety relays	3SK										
Generation		□									
Device version			□								
Device series				□							
Type of outputs					□						
Connection type						□					
Rated control supply voltage								□			
Type of rated control supply voltage									□		
Time delay										□	
Example	3SK	1	1	2	1	–	1	A	B	4	0

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quoted in the catalog in the selection and ordering data.

Benefits

General

- Suitable for all safety applications because of its compliance with the highest safety requirements (SIL 3 PL e)
- Universal use thanks to adjustable parameters
- Worldwide use thanks to globally valid certificates
- Compact SIRIUS design
- Device connectors with standard rail mounting for flexible interconnectability and expandability
- Removable terminals for greater plant availability
- Yellow terminal covers clearly identify the device as a safety component.
- Sensor cable up to 2 000 m long allows it to be used in large-scale plants.

Relay outputs

- Different voltages can be switched through the floating contacts
- Higher currents can be switched with relay contacts

Solid-state outputs

- Wear-free
- Suitable for operation in fast switching applications
- Insensitive to vibrations and dirt
- Good electrical endurance

Power outputs (3SK1 213 output expansion)

- Different voltages can be switched through the floating contacts
- The power relay contacts allow currents of up to 10 A AC-15/DC-13 to be connected
- High mechanical and electrical endurance
- Protective separation between enabling circuits and between enabling circuits and electronics

3ZY1 device connectors

Using 3ZY1 device connectors to combine devices reduces the time required to configure and wire the components. At the same time errors are avoided during wiring, and this considerably reduces the testing required for the fully-configured application.

Microprocessor systems

- Flexible use thanks to many different integrated functions
- Easy parameterization using DIP switches on the front
- High functional reliability based on extensive monitoring functions
- Operated by the machine control system
- Also connection of non-contact sensors (light arrays, light barriers etc.)

Configuration and stock keeping

Variable setting options by means of DIP switches, a wide voltage range and a special power supply unit reduce the cost of keeping stocks and the considerations involved in configuration where the evaluation units to be selected are concerned.

Spring-type terminal with push-in functionality

Push-in connections are a form of spring-type terminals allowing fast wiring without tools for rigid conductors or conductors equipped with end sleeves.

As with other spring-type terminals, a screwdriver (with 3.0 mm x 0.5 mm blade) is required to disconnect the conductor. The same tool can also be used to wire finely-stranded or stranded conductors with no end finishing.

The advantages of the push-in terminals are found, as with all spring-type terminals, in speed of assembly and disassembly and vibration-proof connection. There is no need for the checking and tightening required with screw terminals.

Safety Relays

SIRIUS 3SK1

Standard basic units

Overview



3SK1 11 Standard basic units

The 3SK1 11 Standard basic units are characterized by simple, variable functionality. These devices are recommended for safety functions requiring only a few sensors and a small number of outputs on the safety relay.

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 unit



3SK1 111-1AB30



3SK1 112-1BB40

Rated control supply voltage U_s			DT		DT	
At 60 Hz At AC V		At DC V	Screw terminals		Spring-type terminals (push-in)	
			Order No.	Price per PU	Order No.	Price per PU
Standard basic units with 3 relay enabling circuits						
24	24	A	3SK1 111-1AB30	A	3SK1 111-2AB30	
110 ... 240	110 ... 240	A	3SK1 111-1AW20	A	3SK1 111-2AW20	
Standard basic units with 2 safety-oriented semiconductor outputs						
--	24	A	3SK1 112-1BB40	A	3SK1 112-2BB40	

Overview



3SK1 12 Advanced basic units

The 3SK1 12 Advanced basic units form an innovative system landscape which allows even complex safety functions with large numbers of sensors and outputs to be configured using the device connectors. It is possible to increase both the number of inputs for sensors and the number of enabling circuits of the basic unit without the need for wiring between the devices.

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 unit



3SK1 121-1AB40



3SK1 122-1AB40



3SK1 122-1CB41

Rated control supply voltage U_s at DC	Adjustable off-delay time	Number of outputs		Semiconductor outputs		DT	Screw terminals		DT	Spring-type terminals (push-in)	
		Relay contacts					Order No.	Price per PU		Order No.	Price per PU
V	s	Instantaneous	Delayed	Instantaneous	Delayed						
Advanced basic units with relay outputs											
24	--	3	--	--	--	A	3SK1 121-1AB40	A		3SK1 121-2AB40	
24	0.05 ... 3	2	2	--	--	A	3SK1 121-1CB41	B		3SK1 121-2CB41	
24	0.5 ... 30	2	2	--	--	A	3SK1 121-1CB42	A		3SK1 121-2CB42	
24	5 ... 300	2	2	--	--	B	3SK1 121-1CB44	B		3SK1 121-2CB44	
Advanced basic units with semiconductor outputs											
24	--	--	--	1	--	A	3SK1 120-1AB40	A		3SK1 120-2AB40	
24	--	--	--	3	--	A	3SK1 122-1AB40	A		3SK1 122-2AB40	
24	0.05 ... 3	--	--	2	2	B	3SK1 122-1CB41	B		3SK1 122-2CB41	
24	0.5 ... 30	--	--	2	2	A	3SK1 122-1CB42	A		3SK1 122-2CB42	
24	5 ... 300	--	--	2	2	B	3SK1 122-1CB44	B		3SK1 122-2CB44	

Output expansion units

Overview



3SK1 21 output expansion

The 3SK1 21 output expansions can be used for Standard and Advanced basic units.

3SK1 211 output expansion

The 3SK1 211 output expansion is used to expand the enabling circuits of a basic unit by adding another four enabling circuits. These enabling circuits have a switching capacity of AC-15 4 A at a switching voltage of 230 V. The devices can be connected to any 3SK1 basic unit by means of wiring. In addition the devices with a 24 V DC control supply voltage can also be connected to 3SK1 Advanced basic units by means of the 3ZY1 2 device connector.

3SK1 213 output expansion

The 3SK1 213 output expansion is used to expand the enabling circuits of a basic unit by adding three enabling circuits with high switching capacity. These enabling circuits have a switching capacity of AC-15 10 A at a switching voltage of 230 V. The devices can be connected to any 3SK1 basic unit by means of wiring. As with 3SK1 211, it is also possible to use the version with a control supply voltage of 24 V DC on the 3ZY1 2 device connector.

Note:

It is only possible to expand the Standard basic units by means of wiring. Advanced basic units can be expanded using the 3ZY1 2 device connector.

Benefits

- Perfect adaptation of the number of outputs
- Simple expansion of instantaneous and time-delayed outputs of Advanced basic units by means of device connector and slide switch on expansion module
- Expansion with power contacts for high AC-15/DC-13 currents in the control circuit
- No enabling circuit required in the evaluation unit to control the expansion modules
- No wiring of the feedback circuit to the expansion units
- Shorter installation times
- Less configuring and testing required

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 unit



3SK1 211-1BB00



3SK1 213-1AB40

Rated control supply voltage U_s		Number of outputs, switching instantaneously	Rated operational current ¹⁾		Suitability for use of 3ZY1 2 device connector	DT	Screw terminals		DT	Spring-type terminals (push-in)	
At 60 Hz At AC	at DC		AC	DC			Order No.	Price per PU		Order No.	Price per PU
V	V		A	A							
4RO output expansions											
24	--	4	B300	R300	--	B	3SK1 211-1BB00	A		3SK1 211-2BB00	
--	24	4	B300	R300	✓	A	3SK1 211-1BB40	A		3SK1 211-2BB40	
110 ... 240	110 ... 240	4	B300	R300	--	A	3SK1 211-1BW20	B		3SK1 211-2BW20	
3RO output expansions											
--	24	3	A300	P300	✓	A	3SK1 213-1AB40	A		3SK1 213-2AB40	
115	--	3	A300	P300	--	B	3SK1 213-1AJ20	B		3SK1 213-2AJ20	
230	--	3	A300	P300	--	B	3SK1 213-1AL20	B		3SK1 213-2AL20	

✓ Available
-- Not available

¹⁾ For a detailed description of the NEMA Control Circuit Rating see page 19/7

Overview



3SK1 220 sensor expansion

With the input expansions

- 3SK1 220 sensor expansion
- 3SK1 230 power supply

the Advanced basic units can be made more flexible.

3SK1 220 input expansion

The 3SK1 220 input expansion allows additional sensors to be integrated easily and flexibly. The device monitors two 1-channel sensors or one 2-channel sensor, whatever their output technology (floating/single-ended).

3SK1 230 power supply

The 3SK1 230 power supply makes the 3SK1 devices universally usable, whatever control supply voltage is to be used.

Both devices can be combined with the 3SK1 12 basic units in the Advanced series without the need for wiring.

Note:

The 3SK1 220 sensor expansion can only be connected to the Advanced basic units by means of the 3ZY1 2 device connector.

Alongside the 3ZY1 2 device connector, the 3SK1 230 power supply can also be wired to act as a power supply for 3SK1 devices.

Benefits

- A wide voltage range of 110 ... 240 V AC/DC allows the devices to be used worldwide
- Low stock keeping due to low variance
- Flexible expansion of the number of sensors without the need for additional wiring between the devices
- Perfect adaptation of the number of inputs to suit the application
- Universally usable thanks to the wide range of adjustable parameters for sensor expansion (parameters as for Advanced basic units)

Selection and ordering data



PU (UNIT, SET, M) = 1
PS* = 1 unit



3SK1 220-1AB40



3SK1 230-1AW20

Version		DT	Screw terminals		DT	Spring-type terminals (push-in)	
			Order No.	Price per PU		Order No.	Price per PU
3SK1 220 input expansions							
Sensor expansions		A	3SK1 220-1AB40	A	3SK1 220-2AB40		
For safety-oriented expansion of the Advanced basic units by adding a further two-channel sensor or two single-channel sensors							
Note:							
Can only be used in conjunction with 3ZY1 2 device connectors, see page 13/124.							
3SK1 230 power supplies							
Power supplies		A	3SK1 230-1AW20	A	3SK1 230-2AW20		
For supplying Advanced basic units via 3ZY1 2 device connectors at voltages of 110 ... 240 V AC/DC							

Accessories

Overview

The following accessories are available for SIRIUS 3SK1 safety relays:

- Device connectors
- Terminals
- Sealable covers
- Push-in lugs
- Adapters
- Connection cables
- Inscription labels
- Tools

Device connectors for 3SK1 12. and 3SK1 2..




The device connector allows several safety relays to be interconnected. The last device in a row is placed on a device termination connector. This closes the circuits that were configured with the connectors.

Device connectors are available in various versions specifically for the 3SK1 safety relays:

For type	Device connectors		Device termination connectors	
	3ZY1 212-1BA00 (type 1, width 17.5 mm)	3ZY1 212-2BA00 (type 1, width 22.5 mm)	3ZY1 212-2DA00 (type 1, width 22.5 mm)	3ZY1 212-0FA01 (type 2, set for enclosure 45 mm)
3SK1 Advanced basic units				
3SK1 120	✓	--	--	--
3SK1 121	--	✓	✓	--
3SK1 122	--	✓	✓	--
Output expansions				
3SK1 211	--	✓	✓	--
3SK1 213	--	--	--	✓
Input expansions				
3SK1 220	✓	--	--	--
3SK1 230	--	✓	--	--

✓ Available
-- Not available

Selection and ordering data

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
Device connectors for the electrical connection of SIRIUS devices in the industrial enclosure for fixing on TH 35 standard mounting rail					
 3ZY1 212-1BA00	Device connectors				
	• Type 1, 7-pole, 17.5 mm wide	A	3ZY1 212-1BA00	1	1 unit
	• Type 1, 7-pole, 22.5 mm wide	A	3ZY1 212-2BA00	1	1 unit
	• No function, width 22.5 mm	X	3ZY1 210-2AA00	1	1 unit
 3ZY1 212-2DA00	Device termination connectors				
	• Type 1, 7-pole, 22.5 mm wide	A	3ZY1 212-2DA00	1	1 unit
	• Type 2, 7-pole, 22.5 mm wide	▶	3ZY1 212-2FA00	1	1 unit
	Device termination connector set Type 2, 7-pole, width > 45 mm, comprising 3ZY1 212-2FA00 and 3ZY1 210-2AA00	A	3ZY1 212-0FA01	1	1 unit
Terminals for SIRIUS devices in the industrial enclosure for fixing on TH 35 standard mounting rail					
 3ZY1 121-1BA00	Removable terminals				
	• 2-pole, screw terminals up to 2 x 1.5 mm ² or 1 x 2.5 mm ²	A	3ZY1 121-1BA00	1	6 units
	• 2-pole, screw terminals up to max. 2 x 2.5 mm ² or 1 x 4 mm ²	▶	3ZY1 122-1BA00	1	6 units
	• 3-pole, screw terminals up to max. 2 x 1.5 mm ² or 1 x 2.5 mm ²	▶	3ZY1 131-1BA00	1	6 units
	• 2-pole, push-in terminals up to max. 2 x 1.5 mm ²	▶	3ZY1 121-2BA00	1	6 units
	• 2-pole, push-in terminals up to max. 2 x 2.5 mm ² or 1 x 4 mm ²	▶	3ZY1 122-2BA00	1	6 units
	• 3-pole, push-in terminals up to max. 2 x 1.5 mm ²	▶	3ZY1 131-2BA00	1	6 units

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
Enclosure accessories					
 3ZY1 321-2AA00	Sealable covers				
	• 17.5 mm (for 3SK1 120 and 3SK1 220)	▶ 3ZY1 321-1AA00		1	5 units
	• 22.5 mm (for all 3SK1 devices other than 3SK1 120 and 3SK1 220)	▶ 3ZY1 321-2AA00		1	5 units
 3ZY 1311-0AA00	Push-in lugs for wall mounting	▶ 3ZY1 311-0AA00		1	10 units
Adapters and connection cables					
 3TK28 10-1A  3TK28 10-1B	Adapters for connecting encoders of type Siemens/Heidenhain				
	• 15-pole	A 3TK28 10-1A		1	1 unit
	• 25-pole	A 3TK28 10-1B		1	1 unit
 3TK28 10-0A	Connection cables for connecting the safety relay to the 3TK28 10-1A or 3TK28 10-1B adapter	C 3TK28 10-0A		1	1 unit
Blank inscription labels					
 3RT29 00-1SB20	Unit labeling plates for SIRIUS devices 20 mm x 7 mm, titanium gray	D 3RT29 00-1SB20		100	340 units
Tools for opening spring-type terminals					
 3RA29 08-1A	Screwdrivers for all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm; titanium gray/black, partially insulated				
	▶	Spring-type terminals 3RA29 08-1A		1	1 unit

Safety Relays

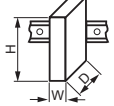
SIRIUS 3SK1

Technical Data

Application

SIRIUS 3SK1 safety relays are used mainly in autonomous safety applications which are not connected to a safety-oriented bus system. Their function here is to evaluate the sensors and the safety-oriented shutdown of hazards. Also they check and monitor the sensors, actuators and safety-oriented functions of the safety relay.

Technical specifications

Type Dimensions <ul style="list-style-type: none"> • Width • Height • Depth 		 mm mm mm		3SK1 safety relays	
				22.5	
				100	
				120	
General technical specifications					
Ambient temperature					
• During operation	°C			-25 ... +60	
• During storage	°C			-40 ... +80	
Installation altitude above sea level, maximum		m		2 000	
Air pressure according to SN 31205		hPa		900 ... 1 060	
Shock resistance				8 g / 11 ms	
Vibration resistance according to IEC 60068-2-6				5 ... 500 Hz: 0.75 mm	
IP degree of protection of the enclosure				IP20	
Touch protection against electric shock				Finger-safe	
Rated insulation voltage		V		300	
Rated impulse withstand voltage		V		4 000	
Safety integrity level (SIL) for time-delayed enabling circuit according to IEC 61508				SIL 3	
Performance level (PL) for time-delayed enabling circuit according to ISO 13849-1				e	
Electromagnetic compatibility (EMC) EMC emitted interference Certificate of suitability				IEC 60947-5-1, class B Available soon	

Code conversion table

The table below lists the existing 3TK28 order numbers with the corresponding 3SK1 order numbers.

Order number 3TK28 basic units	Order number 3SK1 Standard basic units	Order number 3SK1 Advanced basic units
3TK28 20		
3TK28 20-1AJ20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20
3TK28 20-1AL20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20
3TK28 20-1CB30	3SK1 111-1AB30	3SK1 121-1AB40
3TK28 20-2AJ20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20
3TK28 20-2AL20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20
3TK28 20-2CB30	3SK1 111-2AB30	3SK1 121-2AB40
3TK28 21		
3TK28 21-1CB30	3SK1 111-1AB30	3SK1 121-1AB40
3TK28 21-2CB30	3SK1 111-2AB30	3SK1 121-2AB40
3TK28 22		
3TK28 22-1CB30	3SK1 111-1AB30	3SK1 121-1AB40
3TK28 22-2CB30	3SK1 111-2AB30	3SK1 121-2AB40
3TK28 23		
3TK28 23-1CB30	3SK1 111-1AB30	3SK1 121-1AB40
3TK28 23-2CB30	3SK1 111-2AB30	3SK1 121-2AB40
3TK28 24		
3TK28 24-1AJ20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20
3TK28 24-1AL20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20
3TK28 24-1BB40	3SK1 111-1AB30	3SK1 121-1AB40
3TK28 24-1CB30	3SK1 111-1AB30	3SK1 121-1AB40
3TK28 24-2AJ20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20
3TK28 24-2AL20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20
3TK28 24-2BB40	3SK1 111-2AB30	3SK1 121-2AB40
3TK28 24-2CB30	3SK1 111-2AB30	3SK1 121-2AB40
3TK28 25		
3TK28 25-1AB20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20
3TK28 25-1AJ20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20
3TK28 25-1AL20	3SK1 111-1AW20	3SK1 121-1AB40 + 3SK1 230-1AW20
3TK28 25-1BB40	3SK1 111-1AB30	3SK1 121-1AB40
3TK28 25-2AB20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20
3TK28 25-2AJ20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20
3TK28 25-2AL20	3SK1 111-2AW20	3SK1 121-2AB40 + 3SK1 230-2AW20
3TK28 25-2BB40	3SK1 111-2AB30	3SK1 121-2AB40
3TK28 27		
3TK28 27-1AB20	--	--
3TK28 27-1AB21	--	--
3TK28 27-1AJ20	--	3SK1 121-1CB42 + 3SK1 230-1AW20
3TK28 27-1AJ21	--	3SK1 121-1CB41 + 3SK1 230-1AW20
3TK28 27-1AL20	--	3SK1 121-1CB42 + 3SK1 230-1AW20
3TK28 27-1AL21	--	3SK1 121-1CB41 + 3SK1 230-1AW20
3TK28 27-1BB40	--	3SK1 121-1CB42
3TK28 27-1BB41	--	3SK1 121-1CB41
3TK28 27-2AB20	--	--
3TK28 27-2AB21	--	--
3TK28 27-2AJ20	--	3SK1 121-2CB42 + 3SK1 230-2AW20
3TK28 27-2AJ21	--	3SK1 121-2CB41 + 3SK1 230-2AW20
3TK28 27-2AL20	--	3SK1 121-2CB42 + 3SK1 230-2AW20
3TK28 27-2AL21	--	3SK1 121-2CB41 + 3SK1 230-2AW20
3TK28 27-2BB40	--	3SK1 121-2CB42
3TK28 27-2BB41	--	3SK1 121-2CB41

Order number 3TK28 basic units	Order number 3SK1 Standard basic units	Order number 3SK1 Advanced basic units
3TK28 28		
3TK28 28-1AB20	--	--
3TK28 28-1AB21	--	--
3TK28 28-1AJ20	--	3SK1 121-1CB42 + 3SK1 230-1AW20
3TK28 28-1AJ21	--	3SK1 121-1CB41 + 3SK1 230-1AW20
3TK28 28-1AL20	--	3SK1 121-1CB42 + 3SK1 230-1AW20
3TK28 28-1AL21	--	3SK1 121-1CB41 + 3SK1 230-1AW20
3TK28 28-1BB40	--	3SK1 121-1CB42
3TK28 28-1BB41	--	3SK1 121-1CB41
3TK28 28-2AB20	--	--
3TK28 28-2AB21	--	--
3TK28 28-2AJ20	--	3SK1 121-2CB42 + 3SK1 230-2AW20
3TK28 28-2AJ21	--	3SK1 121-2CB41 + 3SK1 230-2AW20
3TK28 28-2AL20	--	3SK1 121-2CB42 + 3SK1 230-2AW20
3TK28 28-2AL21	--	3SK1 121-2CB41 + 3SK1 230-2AW20
3TK28 28-2BB40	--	3SK1 121-2CB42
3TK28 30		
3TK28 30-1AJ20	3SK1 211-1BW20	3SK1 211-1BB40
3TK28 30-1AL20	3SK1 211-1BW20	3SK1 211-1BB40
3TK28 30-1CB30	3SK1 211-1BB40	3SK1 211-1BB40
3TK28 30-2AJ20	3SK1 211-2BW20	3SK1 211-2BB40
3TK28 30-2AL20	3SK1 211-2BW20	3SK1 211-2BB40
3TK28 30-2CB30	3SK1 211-2BB40	3SK1 211-2BB40
3TK28 34		
3TK28 34-1AB20	--	--
3TK28 34-1AJ20	--	3SK1 121-1AB40 + 3SK1 230-1AW20
3TK28 34-1AL20	--	3SK1 121-1AB40 + 3SK1 230-1AW20
3TK28 34-1BB40	--	3SK1 121-1AB40
3TK28 34-2AB20	--	--
3TK28 34-2AJ20	--	3SK1 121-2AB40 + 3SK1 230-2AW20
3TK28 34-2AL20	--	3SK1 121-2AB40 + 3SK1 230-2AW20
3TK28 34-2BB40	--	3SK1 121-2AB40
3TK28 40		
3TK28 40-1BB40	3SK1 112-1BB40	3SK1 122-1AB40
3TK28 40-2BB40	3SK1 112-2BB40	3SK1 122-2AB40
3TK28 41		
3TK28 41-1BB40	3SK1 112-1BB40	3SK1 122-1AB40
3TK28 41-2BB40	3SK1 112-2BB40	3SK1 122-2AB40
3TK28 42		
3TK28 42-1BB41	--	3SK1 122-1CB41
3TK28 42-1BB42	--	3SK1 122-1CB42
3TK28 42-1BB44	--	3SK1 122-1CB44
3TK28 42-2BB41	--	3SK1 122-2CB41
3TK28 42-2BB42	--	3SK1 122-2CB42
3TK28 42-2BB44	--	3SK1 122-2CB44
3TK28 50		
3TK28 50-1AJ20	3SK1 111-1AW20 + 3SK1 213-1AJ20	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 50-1AL20	3SK1 111-1AW20 + 3SK1 213-1AL20	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 50-1BB40	3SK1 111-1AB30 + 3SK1 213-1AB40	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 50-2AJ20	3SK1 111-2AW20 + 3SK1 213-2AJ20	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 50-2AL20	3SK1 111-2AW20 + 3SK1 213-2AL20	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 50-2BB40	3SK1 111-2AB30 + 3SK1 213-2AB40	3SK1 120-2AB40 + 3SK1 213-2AB40

Safety Relays

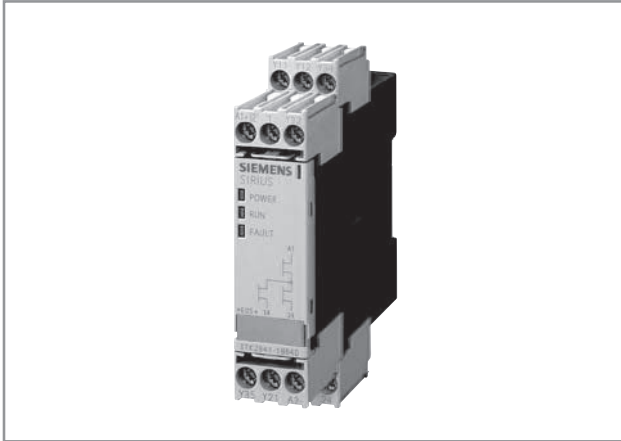
SIRIUS 3SK1

Cross reference

Order number 3TK28 basic units	Order number 3SK1 Standard basic units	Order number 3SK1 Advanced basic units
3TK28 51		
3TK28 51-1AJ20	3SK1 111-1AW20 + 3SK1 213-1AJ20	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 51-1AL20	3SK1 111-1AW20 + 3SK1 213-1AL20	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 51-1BB40	3SK1 111-1AB30 + 3SK1 213-1AB40	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 51-2AJ20	3SK1 111-2AW20 + 3SK1 213-2AJ20	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 51-2AL20	3SK1 111-2AW20 + 3SK1 213-2AL20	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 51-2BB40	3SK1 111-2AB30 + 3SK1 213-2AB40	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 52		
3TK28 52-1AL20	3SK1 111-1AW20 + 3SK1 213-1AL20	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 52-1BB40	3SK1 111-1AB30 + 3SK1 213-1AB40	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 52-2AL20	3SK1 111-2AW20 + 3SK1 213-2AL20	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 52-2BB40	3SK1 111-2AB30 + 3SK1 213-2AB40	3SK1 120-2AB40 + 3SK1 213-2AB40

Order number 3TK28 basic units	Order number 3SK1 Standard basic units	Order number 3SK1 Advanced basic units
3TK28 53		
3TK28 53-1BB40	3SK1 111-1AB30 + 3SK1 213-1AB40	3SK1 120-1AB40 + 3SK1 213-1AB40
3TK28 53-2BB40	3SK1 111-2AB30 + 3SK1 213-2AB40	3SK1 120-2AB40 + 3SK1 213-2AB40
3TK28 56		
3TK28 56-1BB40	3SK1 213-1AB40	3SK1 213-1AB40
3TK28 56-2BB40	3SK1 213-2AB40	3SK1 213-2AB40
3TK28 57		
3TK28 57-1BB41	--	3SK1 213-1AB40 (delay as for basic unit)
3TK28 57-1BB42	--	3SK1 213-1AB40 (delay as for basic unit)
3TK28 57-1BB44	--	3SK1 213-1AB40 (delay as for basic unit)
3TK28 57-2BB41	--	3SK1 213-2AB40 (delay as for basic unit)
3TK28 57-2BB42	--	3SK1 213-2AB40 (delay as for basic unit)
3TK28 57-2BB44	--	3SK1 213-2AB40 (delay as for basic unit)

Overview



SIRIUS 3TK28 safety relay

SIRIUS safety relays are the key modules of a consistent and cost-effective safety chain. Be it EMERGENCY-STOP disconnection, protective door monitoring or the protection of presses or punches – with SIRIUS safety relays every safety application can be implemented to optimum effect in terms of engineering and price.

SIRIUS safety relays provide numerous safety-related functions:

- Monitoring the safety functions of sensors
- Monitoring the sensor leads
- Monitoring the correct operation of the safety relay
- Monitoring actuators for standstill
- Safety-oriented disconnection when dangers arise

Depending on the version of the device, SIRIUS safety relays satisfy the most stringent requirements (PL e) according to ISO 13849-1 and achieve the highest Safety Integrity Level (SIL 3) acc. to IEC 61508.

3TK28 Safety Relays

With relay enabling circuits

Basic units

3TK28 26

[See page 13/134](#)

Basic units T_v

3TK28 26

With electronic enabling circuits

Multifunction units

3TK28 45

[See page 13/134](#)

With special functions

Standstill monitors

3TK28 10-0

[See page 13/134](#)

Overspeed monitors

3TK28 10-1

Benefits

General

- Can be used for all safety applications thanks to compliance with the highest safety requirements (PL e according to ISO 13849-1 or SIL 3 according to IEC 61508)
- Suitable for use all over the world through compliance with all globally established certifications
- Compact, service-proven SIRIUS design creates more space in the control cabinet
- Flexible connectability and expandability make subsequent changes easy
- Removable terminal for greater plant availability
- Yellow front plate clearly identifies the device as an item of safety technology
- Sensor cable up to 2000 m long enables use in large-scale plants

Relay outputs

- Different voltages can be switched through the floating contacts
- Higher currents can be switched with relay contacts

Solid-state outputs

- Wear-free
- Suitable for operation in fast switching applications
- Insensitive to vibrations and dirt
- Good electrical endurance

Microprocessor systems

- Flexible use thanks to many different integrated functions
- Easy parameterization using DIP switches on the front
- High functional reliability based on extensive monitoring functions
- Operated by the machine control system
- Also connection of non-contact sensors (light arrays, light barriers etc.)

Application

SIRIUS safety relays are used mainly in autonomous safety applications which are not connected to a safety-oriented bus system.

Their function here is to evaluate the sensors and the safety-oriented shutdown of hazards. Also they check and monitor the sensors, actuators and safety-oriented functions of the safety relay.

Safety Relays

SIRIUS 3TK28

General data

Overview



SIRIUS 3TK28 2. safety relay

Safety relays with relay enabling circuits – safety with floating contacts

SIRIUS safety relays with relay enabling circuits not only save a great deal of space thanks to their compact design but also offer extra safety in the form of positively driven pairs of make and break contacts. If one of the contacts becomes welded, the other will disconnect the circuit. A positively driven break contact (NC) then performs the fault detection of the faulty make contact (NO).

3TK28 26 safety relays

The 3TK28 26 is a parameterizable safety relay. It is used as an evaluation unit for typical safety chains (detection, evaluation, disconnection). DIP switches on the front can be used to set many different functions. The 3TK28 26 is therefore universally applicable.

Safety sensors (e.g. EMERGENCY-STOP pushbuttons) are connected at the input side while contactors or valves for disconnecting the "hazardous function" are connected at the output side. The 3TK28 26 performs the monitoring of the sensor and actuator functions as well as the safe disconnection of the outputs (enabling circuits).

3TK28 26 with DIP switch:

OFF	Schematic	DIP switch No.	ON
Without crossover monitoring	→ ON	1	Switching mat operation
NC/NO evaluation:	1 <input type="checkbox"/>	2	NC/NC contact evaluation
2 x 1-channel	2 <input type="checkbox"/>	3	1 x 2-channel
Debounce time for sensor inputs 50 ms	3 <input type="checkbox"/>	4	Debounce time for sensor inputs 10 ms
Sensor input autostart	4 <input type="checkbox"/>	5	Sensor input monitored start
Cascading input autostart	5 <input type="checkbox"/>	6	Cascading input monitored start
With start test	6 <input type="checkbox"/>	7	Without start test
Automatic start after mains failure (not permitted in connection with a start test)	7 <input type="checkbox"/>	8	Without automatic start after mains failure
	8 <input type="checkbox"/>		

Benefits

3TK28 26 safety relays

- Compact design
- Connection of all standard sensor types
- Many functions available in a single unit
- Status indications
- Expanded diagnostics options
- Approvals (EN 13849-1, IEC 61508, UL/CSA)
- Signaling of disconnect faults in the actuator circuit
- Floating outputs
- Units with wide voltage range
- Saving of the sensor status in the event of voltage failure
- Can be used up to an ambient temperature of max. 70 °C

Overview

3TK28 45 multi-function units

Evaluation units with solid-state components are being used increasingly in safety applications because their permanent checking of functions and largely wear-free operation results in a far higher switching frequency and electrical endurance of equipment. The compact and lightweight units also permit series connection or normal switching duty, e.g. by a PLC.

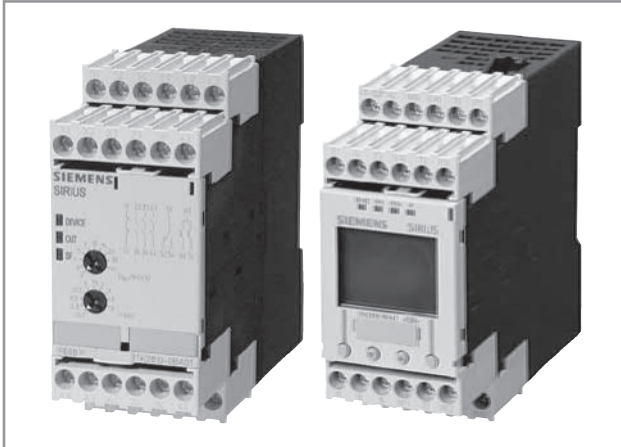
Up to now, standard combinations of safety applications such as EMERGENCY-STOP and protective door monitoring were possible only by using several individual safety relays. 3TK28 45 combines several functions in a single unit. Two solid-state and two relay enabling circuits ensure safe disconnection – in just a few actions, quickly and cheaply.

Benefits

3TK28 45 safety relays

- 2 sensor inputs (e.g. EMERGENCY-STOP, protective door)
- Also suitable for protective door interlocking and OK buttons
- 2 solid-state enabling circuits and 2 relay enabling circuits
- Permanent function checking
- No wear because switched electronically
- High switching frequency
- Long electrical endurance
- Evaluation of solid-state sensors
- Sensor lead up to max. 2 000 m
- Cascading possible
- Insensitive to vibrations and dirt
- Compact design, low weight

Overview



SIRIUS 3TK28 10 safety relays

3TK28 10-0 standstill monitor

The standstill monitor increases safety in hazardous areas. Without a sensor, it detects motor stoppage from the residual magnetization of the rotating motor. When an adjustable threshold value is undershot, it uses its outputs to allow access to hazardous areas for example by unlocking a protective door.

3TK28 10-1 overspeed monitors

The overspeed monitor combines two safety functions in one unit by continuously monitoring machines and plants for standstill and speed.

Through simple parameterization and permanent diagnosis on the display, faults can be quickly remedied at any time – often before they cause plant downtimes.

In addition to standstill and speed monitoring the unit also features integrated monitoring of a protective door with spring-type interlocking. An additional evaluation unit is not needed therefore.

Benefits

3TK28 10-0 standstill monitor

- No additional sensors required
- Signaling of faults with diagnostics display
- Standstill time can be set
- Unit can be used with frequency converters

3TK28 10-1 overspeed monitors

- Menu-prompted, easy parameterization
- Direct diagnosis on the display means shorter downtimes thanks to early fault detection
- Integrated protective door monitoring means greater safety because access to the plant is allowed only in the safe state
- Suitable for all standard sensors, i.e. high flexibility

Safety Relays

SIRIUS 3TK28

General data

Type	Basic units				Standstill monitors 3TK28 10-0	Overspeed monitors 3TK28 10-1
	3TK28 26 24 V DC	Wide voltage range	24 V DC t_V	Wide voltage range t_V		
Sensors						
• Inputs	1	1	1	1	3	4
• Electronic	✓	--	✓	--	--	3
• With contacts	✓	✓	✓	✓	--	1
• Without sensors (measuring inputs)					3	--
• Magnetically operated switch (Reed contacts)	✓	✓	✓	✓	--	--
Safety mats	✓	✓	✓	✓	--	--
Start						
• Auto	✓	✓	✓	✓	✓	✓
• Monitored	✓	✓	✓	✓	--	✓
Cascading input 24 V DC	✓	✓	✓	✓	--	--
Key-operated switch	--	--	--	--	--	--
Enabling circuit, floating						
• Stop category 0	4 NO	4 NO	2 NO	2 NO	3 NO + 1 NC	2
• Stop category 1	--	--	2 NO	2 NO	--	--
Enabling circuit, solid-state						
• Stop category 0	--	--	--	--	--	--
• Stop category 1	--	--	--	--	--	--
Signaling outputs						
• Floating	1 NC	1 NO + 1 NC	2 NC	1 NO + 2 NC	1 CO	--
• Electronic	2	--	2	--	2	2
Standards	EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508	EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508	EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508	EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508	EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508	IEC 60947-5-1, EN ISO 13849-1, EN 60204-1, IEC 61508
Compliance to standards	TÜV, UL, CSA	TÜV, UL, CSA	TÜV, UL, CSA	TÜV, UL, CSA	TÜV, UL, CSA	TÜV
Category according to EN 954-1 max	4	4	4	4	4	4
SIL level max. according to IEC 61508	3	3	3	3	3	3
Performance level PL according to ISO 13849-1	e	e	e	e	e	e
Probability of a dangerous failure per hour (PFH_d)	7.8×10^{-9} 1/h	7.8×10^{-9} 1/h	7.8×10^{-9} 1/h	7.8×10^{-9} 1/h	1.5×10^{-8} 1/h	3.38×10^{-9} 1/h
Rated control supply voltage						
• 24 V DC	✓	--	✓	--	✓	✓
• 24 V AC/DC	--	--	--	--	--	--
• 24 V AC	--	--	--	--	--	--
• 115 V AC	--	--	--	--	--	--
• 230 V AC	--	--	--	--	✓	--
• 400 V AC	--	--	--	--	✓	--
• 24 ... 240 V AC/DC	--	✓	--	✓	--	✓

✓ Available

-- Not available

¹⁾ Only possible for instantaneous enabling contacts, otherwise Category 3.

²⁾ For expansion of Siemens safety products.

³⁾ Only possible for instantaneous enabling contacts, otherwise SIL 2 or Performance Level PL d.

Selection and ordering data

Type	Multi-function units 3TK28 45							
	"Automatic and monitored start"	"Automatic and monitored start"	"Monitored start"	"Monitored start"	OK button	OK button	"Spring-type interlocking"	"Magnet-locked interlocking"
		t_v		t_v		t_v	t_v	t_v
Sensors								
• Inputs	2	2	2	2	2	2	2	2
• Electronic	✓	✓	✓	✓	✓	✓	✓	✓
• With contacts	✓	✓	✓	✓	✓	✓	✓	✓
• Magnetically operated switch (Reed contacts)	✓	✓	✓	✓	✓	✓	✓	✓
Safety mats	✓	✓	✓	✓	--	--	--	--
Start								
• Auto	1	1	--	--	1	1	--	--
• Monitored	1	1	2	2	1	1	2	2
Cascading input 24 V DC	✓	✓	✓	✓	✓	✓	✓	✓
Key-operated switch	✓	✓	✓	✓	✓	✓	✓	✓
Enabling circuit, floating								
• Stop category 0	2 NO	1 NO	2 NO	1 NO	2 NO	1 NO	1 NO	1 NO
• Stop category 1	--	1 NO	--	1 NO	--	1 NO	1 NO	1 NO
Enabling circuit, solid-state								
• Stop category 0	2	1	2	1	2	1	1	1
• Stop category 1	--	1	--	1	--	1	1	1
Signaling outputs								
• Floating	--	--	--	--	--	--	--	--
• Electronic	1	1	1	1	1	1	1	1
Standards	EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508							
Test certificates								
Category according to EN 954-1 max	4	4	4	4	4	4	4	4
SIL level max. according to IEC 61508	3	3	3	3	3	3	3	3
Performance level PL according to ISO 13849-1	e	e	e	e	e	e	e	e
Probability of a dangerous failure per hour (PFH_d)	6.9 x 10 ⁻⁹ 1/h	6.9 x 10 ⁻⁹ 1/h	6.9 x 10 ⁻⁹ 1/h	6.9 x 10 ⁻⁹ 1/h	6.9 x 10 ⁻⁹ 1/h	6.9 x 10 ⁻⁹ 1/h	6.9 x 10 ⁻⁹ 1/h	6.9 x 10 ⁻⁹ 1/h
Rated control supply voltage 24 V DC	✓	✓	✓	✓	✓	✓	✓	✓

✓ Available
-- Not available

¹⁾ The outputs are only safe when an external contactor is used.

Safety Relays

SIRIUS 3TK28

Safety relays

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41L



3TK28 26-2BB4



3TK28 45-1HB40



3TK28 45-1HB41



3TK28 45-2DB40



3TK28 10-0BA01



3TK28 10-1BA41

Rated control supply voltage U_s	Start	OFF-delay t_v	DT	Screw terminals	DT	Spring-type terminals
V		s		Order No.	Price per PU	Order No. Price per PU

Basic units

With floating enabling circuits

3TK28 26

• 24 DC	Auto/monitored	--		3TK28 26-1BB40	A	3TK28 26-2BB40
• 24 ... 240 AC/DC	Auto/monitored	--	}	3TK28 26-1CW30	A	3TK28 26-2CW30

With time-delay enabling circuits

3TK28 26 t_v

• 24 DC	Auto/monitored	0.05 ... 3	A	3TK28 26-1BB41	A	3TK28 26-2BB41
• 24 ... 240 AC/DC	Auto/monitored	0.05 ... 3	A	3TK28 26-1CW31	A	3TK28 26-2CW31
• 24 DC	Auto/monitored	0.5 ... 30	A	3TK28 26-1BB42	A	3TK28 26-2BB42
• 24 ... 240 AC/DC	Auto/monitored	0.5 ... 30	A	3TK28 26-1CW32	A	3TK28 26-2CW32
• 24 DC	Auto/monitored	5 ... 300	A	3TK28 26-1BB44	A	3TK28 26-2BB44
• 24 ... 240 AC/DC	Auto/monitored	5 ... 300	A	3TK28 26-1CW34	A	3TK28 26-2CW34

Multi-function units with electronic enabling circuits

3TK28 45 "Automatic and monitored start"

• 24 DC	1/1	--	A	3TK28 45-1HB40	B	3TK28 45-2HB40
---------	-----	----	---	----------------	---	----------------

3TK28 45 t_v "Automatic and monitored start"

• 24 DC	1/1	0.05 ... 3	A	3TK28 45-1HB41	B	3TK28 45-2HB41
	1/1	0.5 ... 30	A	3TK28 45-1HB42	B	3TK28 45-2HB42
	1/1	5 ... 300	A	3TK28 45-1HB44	B	3TK28 45-2HB44

3TK28 45 "Monitored start"

• 24 DC	--/2	--	A	3TK28 45-1DB40	B	3TK28 45-2DB40
---------	------	----	---	----------------	---	----------------

3TK28 45 t_v "Monitored start"

• 24 DC	--/2	0.05 ... 3	A	3TK28 45-1DB41	B	3TK28 45-2DB41
	--/2	0.5 ... 30	A	3TK28 45-1DB42	B	3TK28 45-2DB42
	--/2	5 ... 300	C	3TK28 45-1DB44	B	3TK28 45-2DB44

3TK28 45 "OK button"

• 24 DC	1/1	--	A	3TK28 45-1EB40	B	3TK28 45-2EB40
---------	-----	----	---	----------------	---	----------------

3TK28 45 t_v "OK button"

• 24 DC	1/1	0.05 ... 3	A	3TK28 45-1EB41	B	3TK28 45-2EB41
	1/1	0.5 ... 30	A	3TK28 45-1EB42	B	3TK28 45-2EB42

3TK28 45 t_v "Spring-type interlocking"

• 24 DC	--/2	0.05 ... 3	A	3TK28 45-1FB41	B	3TK28 45-2FB41
	--/2	0.5 ... 30	A	3TK28 45-1FB42	B	3TK28 45-2FB42
	--/2	5 ... 300	B	3TK28 45-1FB44	B	3TK28 45-2FB44

3TK28 45 t_v "Solenoid interlocking"

• 24 DC	--/2	0.05 ... 3	A	3TK28 45-1GB41	B	3TK28 45-2GB41
	--/2	0.5 ... 30	A	3TK28 45-1GB42	B	3TK28 45-2GB42
	--/2	5 ... 300	C	3TK28 45-1GB44	B	3TK28 45-2GB44

Standstill monitors

3TK28 10-0

• 24 DC	0.2... 6	A	3TK28 10-0BA01	A	3TK28 10-0BA02
• 230 AC	0.2... 6	A	3TK28 10-0GA01	A	3TK28 10-0GA02
• 400 AC	0.2... 6	A	3TK28 10-0JA01	B	3TK28 10-0JA02

Overspeed monitors

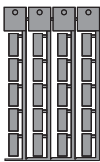







3TK28 10-1 for NPN/PNP proximity switches and encoders

• 24 DC	0 ... 600	A	3TK28 10-1BA41	A	3TK28 10-1BA42
• 120 ... 240 AC/DC	0 ... 600	A	3TK28 10-1KA41	A	3TK28 10-1KA42

3TK28 10-1 for NAMUR proximity switches and encoders

• 24 DC	0 ... 600	A	3TK28 10-1BA41-0AA0	A	3TK28 10-1BA42-0AA0
• 120 ... 240 AC/DC	0 ... 600	A	3TK28 10-1KA41-0AA0	A	3TK28 10-1KA42-0AA0

Accessories



Use	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Blank labels							
 3RT19 00-1SB20	For 3TK28		Unit labeling plates for SIRIUS devices 20 mm x 7 mm, pastel turquoise	▶	3RT19 00-1SB20	100	340 units 41B
	For 3TK28		Inscription labels for sticking for SIRIUS devices				
		• 19 mm x 6 mm, pastel turquoise	C	3RT19 00-1SB60	100	3 060 units	41B
		• 19 mm x 6 mm zinc yellow	C	3RT19 00-1SD60	100	3 060 units	41B
Push-in lugs and covers							
 3RP19 03	For 3TK28		Push-in lugs For screw fixing, 2 units are required for each device	▶	3RP19 03	1	10 units 41H
 3RP19 02	For 3TK28 26		Sealable covers for securing against unauthorized adjustment of setting knobs	B	3TK28 26-0DA00-0HA0	1	5 units 41L
Adapters and connection cables for overspeed monitors							
 3TK28 10-1A	For 3TK28 10-1		Adapters for connecting encoders of type Siemens/Heidenhain				
		• 15-pole	A	3TK28 10-1A	1	1 unit	41L
		• 25-pole	A	3TK28 10-1B	1	1 unit	41L
 3TK28 10-1B							
 3TK28 10-0A	For 3TK28 10-1		Connection cables for connecting the overspeed monitor to the 3TK28 10-1A or 3TK28 10-1B adapter	A	3TK28 10-0A	1	1 unit 41L
Tools for opening spring-type terminals							
 3RA29 08-1A	For auxiliary circuit connections		Screwdrivers For all SIRIUS devices with spring-type terminals 3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	▶	3RA29 08-1A	1	1 unit 41B
					Spring-type terminals		

Safety Relays

SIRIUS 3TK28

3TK2826 with relay enabling circuits

Technical specifications

Type		3TK28 26-.BB40	3TK28 26-.CW30	3TK28 26-.BB41 3TK28 26-.BB42 3TK28 26-.BB44	3TK28 26-.CW31 3TK28 26-.CW32 3TK28 26-.CW44	
General data						
Standards		EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508				
Test certificates		TÜV, UL, CSA				
Safety-oriented output contacts						
• Instantaneous FK_{rel}		4		2		
• Time-delayed $FK_{rel}(tv)$		--		2		
Safety-oriented semiconductor outputs						
• Instantaneous FK_{el}		--				
• Time-delay $FK_{el}(tv)$		--				
Signaling contacts MK_{rel}		1	2		3	
Semiconductor signaling outputs MK_{rel}		2	--	2	--	
Sensor inputs S		1				
Cascading inputs KAS/BS		1				
Degree of protection acc. to EN 60529						
• Enclosure		IP40				
• Terminals		IP20				
Shock resistance sine wave		g/ms	8/10			
Permissible mounting positions		Any				
Touch protection acc. to EN 61140 or EN 60900		Finger-safe				
Height		mm	106: screw terminals; 108: spring-type terminals			
Width		mm	45			
Depth		mm	116			
Weight		kg	0.350			
Connection type		 Screw terminals				
• Terminal screw			M 3 (standard screwdriver, size 2 and Pozidriv 2)			
• Solid		mm ²	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve		mm ²	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5)			
• AWG cables, solid or stranded		AWG	2 x (24 ... 16)			
• Tightening torque		Nm	0.8 ... 1.2			
Connection type		 Spring-type terminals				
• Solid		mm ²	2 x (0.25 ... 1.5)			
• Finely stranded, with end sleeves acc. to DIN 4622		mm ²	2 x (0.25 ... 1.0)			
• Finely stranded		mm ²	2 x (0.25 ... 1.5)			
• Stripped length		mm	10			
Electrical specifications						
Rated control supply voltage U_s		V	24 DC	24 ... 240 AC/DC	24 DC	24 ... 240 AC/DC
Operating rangec						
• AC operation		V	--	0.9 ... 1.1 x U_s	--	0.9 ... 1.1 x U_s
• DC operation			0.85 ... 1.2 x U_s	0.9 ... 1.1 x U_s	0.85 ... 1.2 x U_s	0.9 ... 1.1 x U_s
Measurement voltage		V	--			
Response value U_{resp}		mV	--			
Rated insulation voltage U_i						
• For control circuit		V	--			
• For outputs		V	300			
Rated impulse withstand voltage U_{imp}						
• For control circuit		V	--			
• For outputs		V	4000			
Rated power		W	3			
Frequency ranges		Hz	50/60			
Rated operational current I_e (relay outputs) at						
• AC-15 at 115 V		A	13/14, 23/24, 33/34, 43/44: 4 51/52: 3	13/14, 23/24, 33/34, 43/44: 4 51/52: 3	13/14, 23/24, 33/34, 43/44: 4 51/52: 3	13/14, 23/24, 33/34, 43/44: 4 51/52: 3
• AC-15 at 230 V		A	13/14, 23/24, 33/34, 43/44: 4 51/52: 3	13/14, 23/24, 33/34, 43/44: 4 51/52: 3	13/14, 23/24, 47/48, 57/58: 4 31/32, 61/62: 3	13/14, 23/24, 33/34, 43/44: 4 51/52: 3
• DC-13 at 24 V		A	13/14, 23/24, 33/34, 43/44: 4 51/52: 2	13/14, 23/24, 33/34, 43/44: 4 51/52: 2, 63/64: 1	13/14, 23/24, 47/48, 57/58: 4 31/32, 61/62: 2	13/14, 23/24, 47/48, 57/58: 4 31/32, 61/62: 2 73/74: 1
• DC-13 at 115 V		A	0.2	0.2	0.2	0.2
• DC-13 at 230 V		A	0.1	0.1	0.1	0.1
Rated operational current I_e (semiconductor outputs) at						
• DC-13 at 24 V		A	64, 75: 0.5	--	74, 84: 0.5	--
• DC-13 at 230 V		A	--	--	--	--

3TK2826 with relay enabling circuits

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Type		3TK28 26-.BB40	3TK28 26-.CW30	3TK28 26-.BB41 3TK28 26-.BB42 3TK28 26-.BB44	3TK28 26-.CW31 3TK28 26-.CW32 3TK28 26-.CW44
Electrical specifications (continued)					
Electrical endurance	Oper. cycles	--			
Mechanical endurance	Oper. cycles	10 ⁷			
Switching frequency z	1/h	2000			
Conventional thermal current I_{th}	A	Summation current max. 12			
Conventional thermal current I_{th}					
• 1 contact	A	4			
• 2 contacts	A	4			
• 3 contacts	A	4			
• 4 contacts	A	3			
Fusing for output contacts Fuse links LV HRC Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE, gL/gG operational class					
• gL/gG	A	4			
• Quick	A	6			
Maximum line resistance	Ω	1000			
Cable length from terminal to terminal With Cu 1.5 mm ² and 150 nF/km	m	2000			
Times					
Bridging of voltage dips, supply voltage (only internal, no outputs)	ms	Min. 10			
Make-time t_E					
• For automatic start typ.	ms	50 + debounce time			
• For automatic start max.	ms	50 + debounce time			
• For automatic start after mains failure typ	ms	Approx. 8000 starting time			
• For automatic start after mains failure max	ms	Approx. 8000 starting time			
• For monitored start typ.	ms	50 + debounce time			
• For monitored start max.	ms	50 + debounce time			
Release time t_R					
• For sensor typ.	ms	50 + deb. time	50 + deb. time	--	--
• For sensor max.	ms	--	--	50+ deb. time	50+ deb. time
• For mains failure typ.	ms	75	75	75	75
• For mains failure max.	ms	125	300	125	320
Recovery time t_W					
• After sensor	ms	Min. 250		Min. 250	Min. 250
• After mains failure	s	Min. 200		Min. 600	Min. 200
Minimum command duration t_B					
• Sensor input	ms	30			
• ON button	s	0.2 ... 5			
• Cascading input	s	--			
Simultaneity t_G	ms	∞			
Temperatures					
Permissible ambient temperature					
• During operation	°C	-25 ... +60			
• During storage	°C	-40 ... +80			
Safety specifications					
Safety integrity level SIL CL acc. to IEC 61508		3			
Performance level PL acc. to ISO 13849-1		e			
Safety category CAT acc. to EN 954-1		4			
Type acc. to EN 574		--			
Probability of a dangerous failure					
• Per hour (PFH _D)	1/h	7.8 x 10 ⁻⁹	7.8 x 10 ⁻⁹	7.8 x 10 ⁻⁹	7.8 x 10 ⁻⁹
• On demand (PFD)		--	--	--	--
Proof-test interval T1	a	20			
Environmental data					
EMC		EN 60947-5-1			
Vibrations acc. to EN 60068-2-6					
• Frequency	Hz	5 ... 500			
• Amplitude	mm	0.075			
Climatic withstand capability		EN 60068-2-1, EN 60068-2-2, EN 60068-2-14, EN 60068-2-30			
Clearances in air and creepage distances		EN 60947-1			



¹⁾ Time-delayed enabling circuit: ≤ 300 ms adjustable.

Safety Relays

SIRIUS 3TK28

3TK2845 with electronic enabling circuits

Technical specifications

Type		3TK28 45-..B40	3TK28 45-..B41 3TK28 45-..B42 3TK28 45-..B44
General data			
Standards		EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508	
Test certificates		TÜV, UL, CSA	
Safety-oriented output contacts			
• Instantaneous FK _{rel}		2	1
• Time-delayed FK _{rel} (tv)		--	1
Safety-oriented semiconductor outputs			
• Instantaneous FK _{el}		2	1
• Time-delay FK _{el} (tv)		--	1
Signaling contacts MK _{rel}			
Semiconductor signaling outputs MK _{rel}		1	
Sensor inputs S		2	
Cascading inputs KAS/BS		1	
Degree of protection acc. to EN 60529			
• Enclosure		IP40	
• Terminals		IP20	
Shock resistance sine wave		g/ms	8/10 and 15/5
Permissible mounting positions		Any	
Touch protection acc. to EN 61140 or EN 60900		Finger-safe	
Height	mm	102: Screw terminals; 104: Spring-type terminals	
Width	mm	45	
Depth	mm	120	
Weight	kg	0.400	
Connection type			Screw terminals
• Terminal screw		M 3 (standard screwdriver, size 2 and Pozidriv 2)	
• Solid	mm ²	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve	mm ²	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)	
• Tightening torque	Nm	0.8 ... 1.2	
Connection type			Spring-type terminals
• Solid	mm ²	2 x (0.25 ... 1.5)	
• Finely stranded, with end sleeves acc. to DIN 46228	mm ²	2 x (0.25 ... 1.5)	
• Finely stranded	mm ²	2 x (0.25 ... 1.5)	
Electrical specifications			
Rated control supply voltage U _s	V	24 DC	
Operating range DC operation	V	0.85 ... 1.15 × U _s	
Rated insulation voltage U _i			
• For control circuit	V	50	
• For outputs	V	50/300	
Rated impulse withstand voltage U _{imp}			
• For control circuit	V	500	
• For outputs	V	500/4000	
Rated power at U _s	W	2.5	
Frequency ranges	Hz	--	
Rated operational current I _e (relay outputs) at			
• AC-15 at 115 V	A	--	
• AC-15 at 230 V	A	3	
• DC-13 at 24 V	A	1	
• DC-13 at 115 V	A	--	
• DC-13 at 230 V	A	0.1	
Rated operational current I _e (semiconductor outputs) at			
• DC-13 at 115 V	A	0.5	
• DC-13 at 230 V	A	--	
Electrical endurance	Operat- ing cycles	Unlimited	
Mechanical endurance	Operat- ing cycles	10 ⁵	
Switching frequency z	1/h	2000	

Technical specifications



Type		3TK28 45-..B40	3TK28 45-..B41 3TK28 45-..B42 3TK28 45-..B44
Electrical specifications (continued)			
Conventional thermal current I_{th}		--	
Conventional thermal current I_{th}			
• 1 contact	A	--	
• 2 contacts	A	--	
• 3 contacts	A	--	
• 4 contacts	A	--	
Fusing for output contacts			
Fuse links LV HRC Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE, gL/gG operational class		Not required	
• gL/gG		Not required	
• Quick			
Maximum line resistance	Ω	1000	
Cable length from terminal to terminal	m	1000	
With Cu 1.5 mm ² and 150 nF/km			
Times			
Bridging of voltage dips, supply voltage (only internal, no outputs) (only internal, no outputs)	ms	25	
Make-time t_E			
• For automatic start typ.	ms	60	
• For automatic start max.	ms	100	
• For automatic start after mains failure typ.	ms	--	
• For automatic start after mains failure max.	ms	--	
• For monitored start typ.	ms	60	
• For monitored start max.	ms	100	
Release time t_R			
• For sensor typ.	ms	45	--
• For sensor max.	ms	--	0.05 ... 300
			Adjustable
• For mains failure typ.	ms	25	25
• For mains failure max.	ms	30	30
Recovery time t_W			
• After sensor	ms	400	
• After mains failure	s	Max. 8	
Minimum command duration t_B			
• Sensor input	ms	45	
• ON button input	ms	200 ... 5000	
• Cascading input	ms	45	
Simultaneity t_G	ms	∞	
Temperatures			
Permissible ambient temperature			
• During operation	°C	-25 ... +60	
• During storage	°C	-40 ... +80	
Safety specifications			
Safety integrity level SIL CL acc. to IEC 61508		3	
Performance level PL acc. to ISO 13849-1		e	
Safety category CAT acc. to EN 954-1		4	
Type acc. to EN 574			
Probability of a dangerous failure			
• Per hour (PFH _D)	1/h	6.86 x 10 ⁻⁹	
• On demand (PFD)		--	
Proof-test interval T1	a	20	
Environmental data			
EMC			
			IEC 60947-5-1, IEC 60000-4-3, IEC 60000-4-5, IEC 60000-4-6
Vibrations acc. to EN 60068-2-6			
• Frequency	Hz	5 ... 500	
• Amplitude	mm	0.075	
Climatic withstand capability		EN 60068-2-78	
Clearances in air and creepage distances		EN 60947-1	

Safety Relays

SIRIUS 3TK28

3TK2810 with special functions

Technical specifications

Type		3TK28 10
General data		
Standards		EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508
Test certificates		TÜV, UL, CSA
Safety-oriented output contacts		
• Instantaneous FK_{rel}		4
• Time-delayed $FK_{rel}(tv)$		--
Safety-oriented semiconductor outputs		
• Instantaneous FK_{el}		--
• Time-delay $FK_{el}(tv)$		--
Signaling contacts MK_{rel}		1
Semiconductor signaling outputs MK_{rel}		2
Sensor inputs S		1
Cascading inputs KAS/BS		--
Degree of protection acc. to EN 60529		
• Enclosure		IP40
• Terminals		IP20
Shock resistance sine wave	g/ms	8/10
Permissible mounting positions		Any
Touch protection acc. to EN 61140 or EN 60900		Finger-safe
Height	mm	106: screw terminals; 108: spring-type terminals
Width	mm	45
Depth	mm	116
Weight	kg	0.500
Connection type		 Screw terminals
• Terminal screw		M 3 (standard screwdriver, size 2 and Pozidriv 2)
• Solid	mm ²	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm ²	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5)
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)
• Tightening torque	Nm	0.8 ... 1.2
Connection type		 Spring-type terminals
• Solid	mm ²	2 x (0.25 ... 1.5)
• Finely stranded, with end sleeves acc. to DIN 46228	mm ²	2 x (0.25 ... 1.0)
• Finely stranded	mm ²	2 x (0.25 ... 1.5)
Electrical specifications		
Rated control supply voltage U_s	V	24 DC, 230/400 AC
Operating range		
• AC operation	V	0.8 ... 1.1 x U_s
• DC operation	V	0.9 ... 1.15 x U_s
Measurement voltage	V	Max. 690
Response value U_{resp}	V	20 ... 400 adjustable
Rated insulation voltage U_i		
• For control circuit	V	300
• For outputs	V	690
Rated impulse withstand voltage U_{imp}		
• For control circuit	V	6/4
• For outputs	V	6
Rated power at U_s	W	3
Frequency ranges	Hz	50/60
Rated operational current I_e (relay outputs) at		
• AC-15 at 115 V	A	--
• AC-15 at 230 V	A	3 (NO contacts); 2 (NC contacts)
• DC-13 at 24 V	A	2
• DC-13 at 115 V	A	--
• DC-13 at 230 V	A	--
Rated operational current I_e (semiconductor outputs) at		
• DC-13 at 115 V	A	0.1
• DC-13 at 230 V	A	--
Electrical endurance	Operating cycles	2×10^5
Mechanical endurance	Operating cycles	5×10^7
Switching frequency z	1/h	1200

Technical specifications

Type	3TK28 10	
Electrical specifications (continued)		
Conventional thermal current I_{th}	A	5, summation current max. 8
Conventional thermal current I_{th}		
• 1 contact	A	5
• 2 contacts	A	5
• 3 contacts	A	5
• 4 contacts	A	--
Fusing for output contacts		
Fuse links LV HRC Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE, gL/gG operational class		
• gL/gG		--
• Quick	A	5
Maximum line resistance	Ω	--
Cable length from terminal to terminal	m	--
With Cu 1.5 mm ² and 150 nF/km		
Times		
Release time t_R		
• For sensor typ.	ms	--
• For sensor max.	ms	6 adjustable
• For mains failure typ.	ms	--
• For mains failure max.	ms	--
Simultaneity t_G	ms	∞
Temperatures		
Permissible ambient temperature		
• During operation	°C	-25 ... +60
• During storage	°C	-40 ... +75
Safety specifications		
Safety integrity level SIL CL		3
acc. to IEC 61508		
Performance level PL		e
acc. to ISO 13849-1		
Safety category CAT		4
acc. to EN 954-1		
Probability of a dangerous failure		
• Per hour (PFH _D)	1/h	1.49 x 10 ⁻⁹
• On demand (PFD)		--
Proof-test interval T1	a	20

Safety Relays

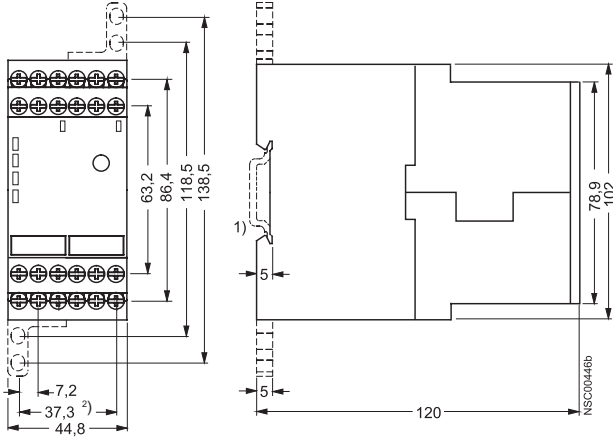
SIRIUS 3TK28

Dimensional drawings

Dimension drawings ¹⁾

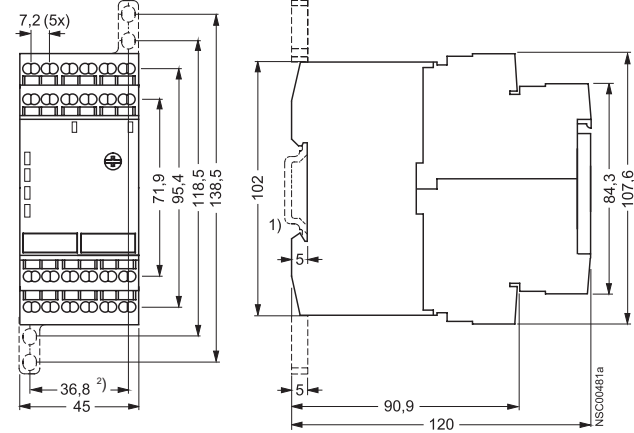
3TK28 safety relays with screw terminals

3TK28 26 with screw terminals



3TK28 safety relays with Spring Loaded terminals

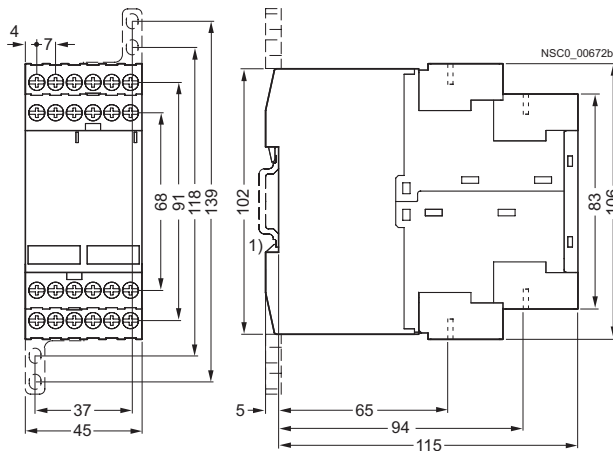
3TK28 with spring loaded terminals



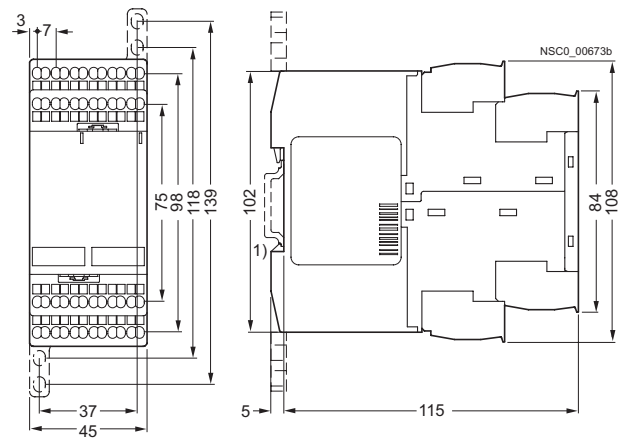
1) For 35 mm standard rail to EN 50 022.

2) Dimension for screw mounting. Screw mounting with 2 plug-in tabs 3RP19 03 per 3TK28 unit.

3TK28 10 with screw terminals

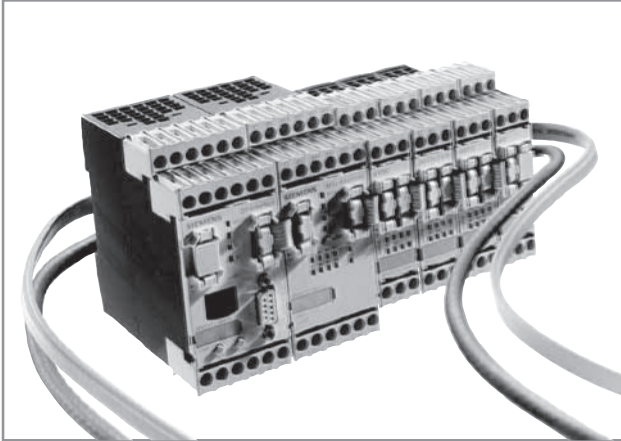


3TK28 10 with spring loaded terminals



1) For standard mounting rail TH 35 according to EN 60715.

Overview



SIRIUS 3RK3 Modular Safety System

The 3RK3 Modular Safety System (MSS) is a freely parameterizable modular safety relay. Depending on the external circuit version, safety-oriented applications up to Performance Level e according to EN ISO 13849-1 or SIL 3 according to IEC 62061 can be realized.

The modular safety relay enables the interconnection of several safety applications.

The comprehensive error and status diagnostics provides the possibility of finding errors in the system and localizing signals from sensors. Plant downtimes can be reduced as the result.

The MSS comprises the following system components:

- Central units
- Expansion modules
- Interface modules
- Diagnostics modules
- Parameterization software
- Accessories

Central units

MSS Basic

The 3RK3 Basic central unit is used wherever more than three safety functions need to be evaluated and the wiring parameterization of safety relays would involve great cost and effort. It reads in inputs, controls outputs and communicates through an interface module with higher-level control systems. An application's entire safety program is processed in the central unit. The 3RK3 Basic central unit is the lowest expansion level and fully functional on its own, without the optional expansion modules.

MSS Advanced

The 3RK3 Advanced central unit is the consistent expansion of the Basic central unit with the functionality of an AS-i safety monitor. In addition to having a larger volume of project data and scope of functionality, it can be integrated into AS-Interface and therefore makes use of the many different possibilities offered by this bus system. The function can be optionally activated in the central unit.

The service-proven insulation piercing method of AS-Interface enables not only the distributed expansion of the project data volume using safe AS-i outputs, safe AS-i sensors and other MSS Advanced or safety monitors (F cross traffic) but also a highly flexible adaptation of the application, e.g. very fast connection of AS-i outputs, LV HRC command devices, position switches with and without interlocking, or light arrays.

Safety-oriented disconnection using MSS or by distributed means using safe AS-i outputs and the formation of switch-off groups can be implemented very easily. The same applies for any subsequent modifications. They are now easily possible by re-addressing, i.e. re-wiring is no longer necessary.

The AS-i bus is connected directly to the central unit.

MSS ASIsafe

The MSS ASIsafe basic and MSS ASIsafe extended central units are a logical development of the AS-i safety monitors based on the 3RK3 Modular Safety System.

Like MSS Advanced, MSS ASIsafe detects – in a comparable way to the safety monitors – safe sensor technology on the AS-i bus and switches actuators off in a safety-oriented manner via a configurable safety logic. It stands out by virtue of its greater project data volume, wider range of functions and the possibility of increasing the integrated I/O project data volume by means of expansion modules from the MSS system family. In this case the range of functions, such as the number and type of the logic elements that can be interconnected, is equivalent to that of MSS Advanced.

Expansion modules

With the optional expansion modules, both safety-related and standard, the system is flexibly adapted to the required safety applications.

Interface modules

The DP interface module is used for transferring diagnostics data and device status data to a higher-level PROFIBUS network, e.g. for purposes of visualization via HMI. When using the Basic central unit, 32-bit cyclic data can be exchanged with the control system. If an Advanced/ASIsafe central unit is used, the number is doubled to 64-bit cycle data. The acyclic calling of diagnostics data is possible with both central units.

Diagnostics modules

Faults like a cross-circuit, for instance, are displayed directly on the diagnostic display. The fault is diagnosed directly in plain text by the detailed alarm message. The device is fully functional upon delivery. No programming is required.

Parameterization software

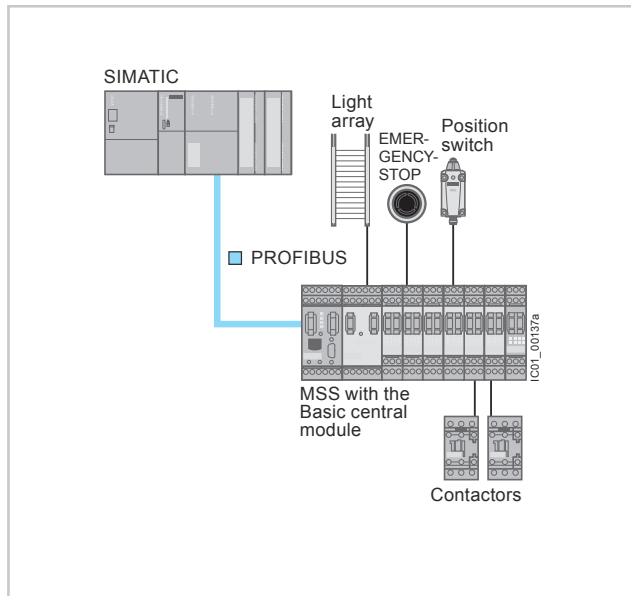
Using the MSS ES graphical parameterization tool it is very easy to create the safety functions as well as their logical links on the PC. You can define disconnection ranges, ON-delays, OFF-delays and other dependent factors, for example.

MSS ES also offers comprehensive functions for diagnostics and commissioning. Documentation of the MSS hardware layout and the parameterized logic is drawn up automatically.

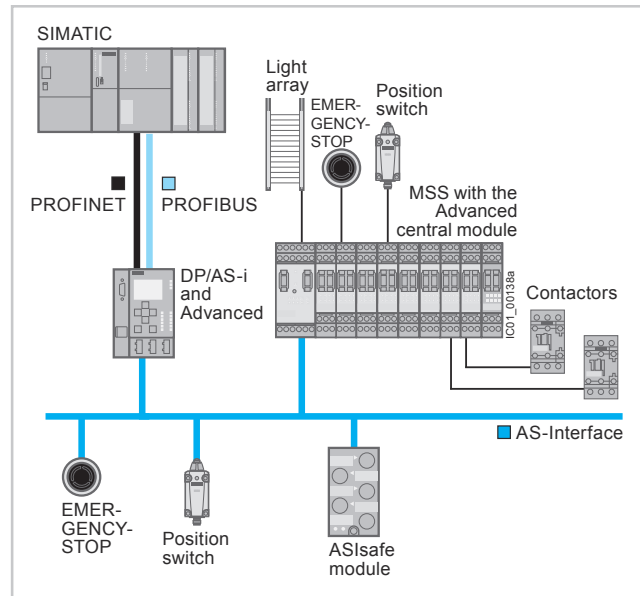
Safety Relays

SIRIUS 3RK3 Modular Safety System

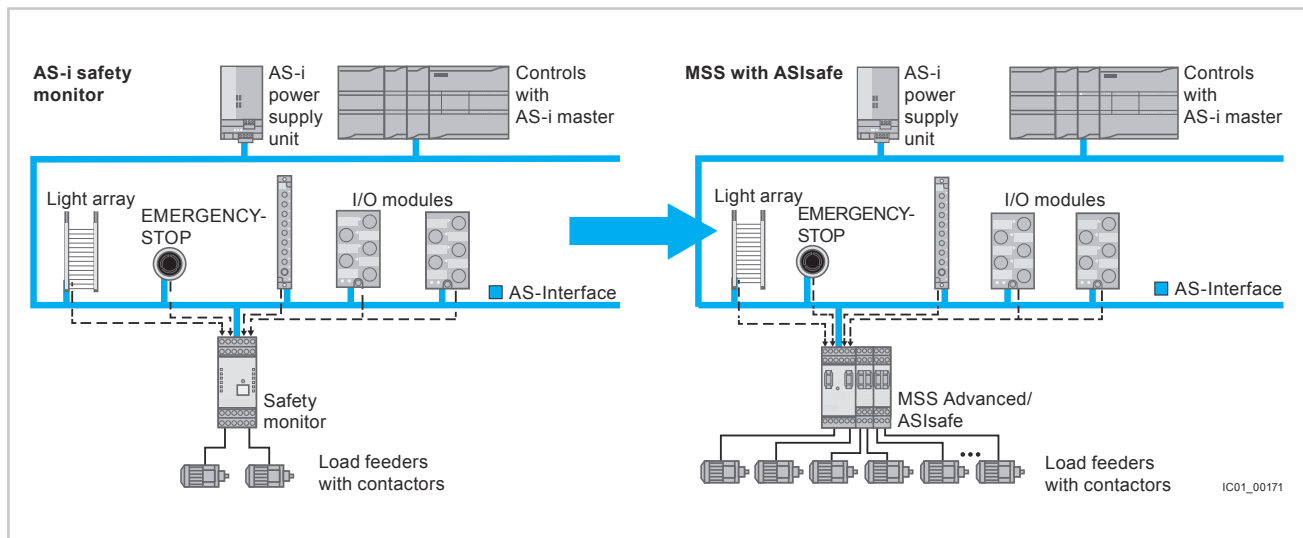
General data



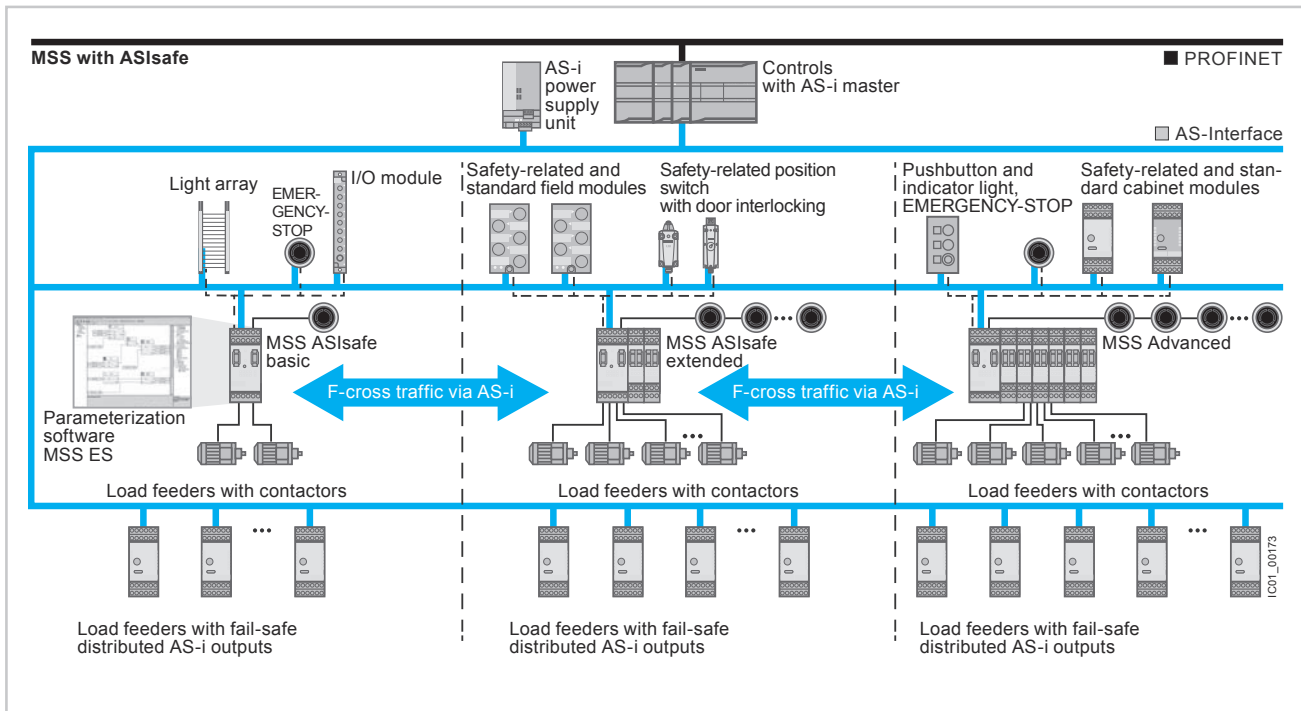
System configuration with the Basic central unit



System configuration with the Advanced central unit



Further development of the system design: from the safety monitor to MSS Advanced/MSS ASIsafe



MSS with ASIsafe

Order No. scheme

Digit of the Order No.	1st - 4th	5th	6th	7th	8th	9th	10th	11th	12th
	□□□□	□	□	□	-	□	□	□	□
Modular safety system	3 R K 3								
Device type		□							
Device type			□	□					
Connection type					□				
Communications						□	□	□	
Version									□
Example	3 R K 3	1	1	1	-	1	A	A	1 0

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quoted in the catalog in the selection and ordering data.

Safety Relays

SIRIUS 3RK3 Modular Safety System

General data

Benefits

- More functionality and flexibility through freely configurable safety logic
- Suitable for all safety applications thanks to compliance with the highest safety standards in factory automation
- For use all over the world through compliance with all product-relevant, globally established certifications
- Modular hardware configuration
- Parameterization by means of software instead of wiring
- Removable terminals for greater plant availability
- Distributed collection from sensors and disconnection of actuators through AS-Interface
- All MSS ES logic functions are also usable for AS-Interface, e. g. muting, protective door with interlocking
- Up to 12 independent safe switch-off groups on the AS-i bus
- Volume of project data can be greatly increased by means of AS-Interface
- Up to 50 two-channel enabling circuits per system

Communication through PROFIBUS

The 3RK3 Modular Safety System can be connected to PROFIBUS through the DP interface and can exchange data with higher-level control systems.

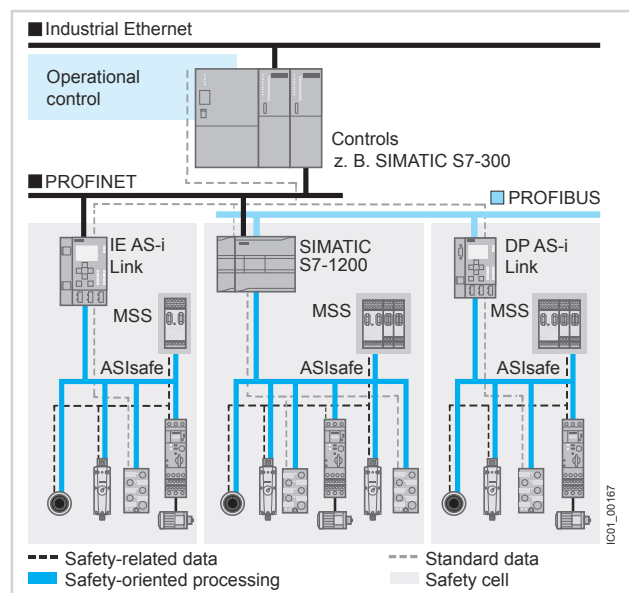
The MSS supports among other things:

- Baud rates up to 12 Mbit/s
- Automatic baud rate detection
- Cyclic services (DPV0) and acyclic services (DPV1)
- Exchange of 32-bit cyclic data with MSS Basic or 64-bit cyclic data with MSS Advanced/MSS ASIsafe
- Diagnostics using data record invocations

AS-Interface communication

The 3RK3 Modular Safety System can be integrated into AS-Interface with the Advanced and ASIsafe central units.

- MSS can read in up to 31 AS-i sensors
- Up to 12 preprocessed signals per MSS can be placed on the AS-i bus, e.g. for F-cross traffic or for disconnecting safe AS-i outputs
- Safe cross-traffic between MSS Advanced and MSS ASIsafe or with other AS-i safety monitors
- Standard signals, e.g. for acknowledgement, can also be placed on the bus



Integration of MSS into AS-Interface as ASIsafe Solution local

MSS with communication function [see page 13/147 onwards](#).

Accessories [see page 13/149 onwards](#).

For more information on AS-Interface with ASIsafe, [see also Chapter 14 on Industrial Communication](#).

Selection and ordering data



PU (UNIT, SET, M) = 1
PS* = 1 unit



3RK3 111-1AA10



3RK3 121-1AC00
3RK3 122-1AC00
3RK3 131-1AC10

Version	DT	Screw terminals		DT	Spring-type terminals	
		Order No.	Price per PU		Order No.	Price per PU
Central units						
3RK3 Basic Central unit with safety-oriented inputs and outputs • 8 non-fail-safe inputs • 1 two-channel relay output • 1 two-channel solid-state output Max. 7 expansion modules can be connected <u>Note:</u> Memory module 3RK3 931-0AA00 is included in the scope of supply.	▶	3RK3 111-1AA10	A	3RK3 111-2AA10		
3RK3 Advanced Central units for connecting to AS-Interface with safety-oriented inputs and outputs and extended scope of functions • 8 non-fail-safe inputs • 1 two-channel relay output • 1 two-channel solid-state output Max. 9 expansion modules can be connected <u>Note:</u> Memory module 3RK3 931-0AA00 is included in the scope of supply.	▶	3RK3 131-1AC10	A	3RK3 131-2AC10		
3RK3 ASIsafe basic Central units for connecting to AS-Interface with safety-oriented inputs and outputs and extended scope of functions • 2 fail-safe inputs • 6 non-fail-safe inputs • 1 two-channel relay output • 1 two-channel solid-state output No expansion modules can be connected <u>Note:</u> Memory module 3RK3 931-0AA00 is included in the scope of supply.	A	3RK3 121-1AC00	A	3RK3 121-2AC00		
3RK3 ASIsafe extended Central units for connecting to AS-Interface with safety-oriented inputs and outputs and extended scope of functions • 4 fail-safe inputs • 4 non-fail-safe inputs • 1 two-channel relay output • 1 two-channel solid-state output Max. 2 expansion modules can be connected <u>Note:</u> Memory module 3RK3 931-0AA00 is included in the scope of supply.	A	3RK3 122-1AC00	A	3RK3 122-2AC00		

Note:

More information on the Internet at
www.siemens.com/sirius-mss.

Safety Relays

SIRIUS 3RK3 Modular Safety System

Expansion modules, interface modules,
operating & monitoring modules

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 unit



3RK3 211-1AA10
3RK3 221-1AA10
3RK3 231-1AA10
3RK3 242-1AA10



3RK3 251-1AA10





3RK3 311-1AA10
3RK3 321-1AA10



3RK3 511-1BA10



3RK3 611-3AA00







Version	DT	Screw terminals		DT	Spring-type terminals	
		Order No.	Price per PU		Order No.	Price per PU
Expansion modules						
4/8 F-DI Safety-related input modules • 8 inputs	A	3RK3 211-1AA10		A	3RK3 211-2AA10	
2/4 F-DI 1/2 F-RO Safety-related input/output modules • 4 inputs • 2 single-channel relay outputs	A	3RK3 221-1AA10		A	3RK3 221-2AA10	
2/4 F-DI 2F-DO Safety-related input/output modules • 4 inputs • 2 two-channel solid-state outputs	▶	3RK3 231-1AA10		A	3RK3 231-2AA10	
4/8 F-RO Safety-oriented output modules • 8 single-channel relay outputs	A	3RK3 251-1AA10		▶	3RK3 251-2AA10	
4 F-DO Safety-oriented output modules • 4 two-channel solid-state outputs	A	3RK3 242-1AA10		▶	3RK3 242-2AA10	
8 DI Standard input module • 8 inputs	▶	3RK3 321-1AA10		▶	3RK3 321-2AA10	
8 DO Standard output module • 8 solid-state outputs	A	3RK3 311-1AA10		A	3RK3 311-2AA10	
Interface modules						
DP interface PROFIBUS DP interface, 12 Mbit/s, RS 485, 32-bit cyclic data exchange with Basic central unit or 64-bit with Advanced central unit, acyclic exchange of diagnostics data	A	3RK3 511-1BA10		A	3RK3 511-2BA10	
Operating and monitoring modules						
Diagnostics module	A	3RK3 611-3AA00			--	

Note:

Connection cable required, see page 13/149.

More information on the Internet at
www.siemens.com/sirius-mss.

Selection and ordering data

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
Connection cables (essential accessory)					
 3UF7 932-0AA00-0	Connection cables				
	For connection of				
	Central units with expansion modules or interface module	Diagnostics modules with central unit or interface module			
	✓	✓	• Length 0.025 m (flat)	3UF7 930-0AA00-0	1 1 unit
	--	✓	• Length 0.1 m (flat)	3UF7 931-0AA00-0	1 1 unit
	--	✓	• Length 0.3 m (flat)	3UF7 935-0AA00-0	1 1 unit
	--	✓	• Length 0.5 m (flat)	3UF7 932-0AA00-0	1 1 unit
	--	✓	• Length 0.5 m (round)	3UF7 932-0BA00-0	1 1 unit
	--	✓	• Length 1.0 m (round)	3UF7 937-0BA00-0	1 1 unit
	--	✓	• Length 2.5 m (round)	3UF7 933-0BA00-0	1 1 unit
PC cables and adapters					
 3UF7 940-0AA00-0	PC cables		▶	3UF7 940-0AA00-0	1 1 unit
	For connecting to the serial interface of a PC/PG, for communication with 3RK3 through the system interface				
	USB PC cables		▶	3UF7 941-0AA00-0	1 1 unit
	For connecting to the USB interface of a PC/PG, for communication with 3RK3 through the system interface, recommended for use in connection with 3RK3				
	USB/serial adapters	B	3UF7 946-0AA00-0	1 1 unit	
For connecting the RS 232 PC cable to the USB interface of a PC					
Interface covers					
 3UF7 950-0AA00-0	Interface covers		▶	3UF7 950-0AA00-0	1 5 units
	For system interface				
Memory modules					
 3RK3 931-0AA00	Memory modules		▶	3RK3 931-0AA00	1 1 unit
	For backing up the complete parameterization of the 3RK3 Modular Safety System without a PC/PG through the system interface				
Door adapters					
 3UF7 920-0AA00-0	Door adapters			3UF7 920-0AA00-0	1 1 unit
	For external connection of the system interface, e.g. outside a control cabinet				
Push-in lugs					
 3RP19 03	Push-in lugs for screw fixing				
	e.g. on mounting plate, 2 units required per device				
	Can be used for 3RK3		▶	3RP19 03	1 10 units
Manuals					
Manuals for the 3RK3 Modular Safety System (MSS)					
• English		C	3ZX1 012-0RK31-1AC1	1 1 unit	

✓ Available

-- Not available

✓ Available
-- Not available




Safety Relays

SIRIUS 3RK3 Modular Safety System

Accessories

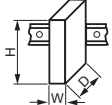
Parameterization, startup and diagnostics software for 3RK3

- Runs under Windows XP Professional (Service Pack 2 or 3), Windows 7 32/64 Bit Professional/Ultimate/Enterprise (Service Pack 1)
- Delivered without PC cable. Please order separately, see page 13/149.

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*
Modular Safety System ES 2008 Basic					
 3ZS1 314-4CC10-0YA5	Floating license for one user Engineering software in limited-function version for diagnostics purposes, software and documentation on CD, 3 languages (German/English/French), communication through the system interface				
	• License key on USB stick, Class A	A	3ZS1 314-4CC10-0YA5	1	1 unit
	• License key download, Class A	▶	3ZS1 314-4CE10-0YB5	1	1 unit
Modular Safety System ES 2008 Standard					
 3ZS1 314-5CC10-0YA5	Floating license for one user Engineering software, software and documentation on CD, 3 languages (German/English/French), communication through system interface				
	• License key on USB stick, Class A	B	3ZS1 314-5CC10-0YA5	1	1 unit
	• License key download, Class A	▶	3ZS1 314-5CE10-0YB5	1	1 unit
	Powerpack for MSS ES 2008 Basic to Standard Floating license for one user, engineering software, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface				
		A	3ZS1 314-5CC10-0YD5	1	1 unit
	Software Update Service For 1 year with automatic extension, assuming the current software version is in use, engineering software, software and documentation on CD, communication through the system interface	▶	3ZS1 314-5CC10-0YL5	1	1 unit
Modular Safety System ES 2008 Premium					
 3ZS1 314-6CC10-0YA5	Floating license for one user Engineering software, software and documentation on CD, 3 languages (German/English/French), communication through PROFIBUS or the system interface, online diagnostics via PROFIBUS, creating, importing and exporting macros				
	• License key on USB stick, Class A	▶	3ZS1 314-6CC10-0YA5	1	1 unit
	• License key download, Class A	▶	3ZS1 314-6CE10-0YB5	1	1 unit
	Powerpack for MSS ES 2008 Standard to Premium Floating license for one user, engineering software, license key on USB stick, Class A, 3 languages (German/English/French), communication through PROFIBUS or the system interface, online diagnostics via PROFIBUS, creating, importing and exporting macros				
		A	3ZS1 314-6CC10-0YD5	1	1 unit
	Software Update Service For 1 year with automatic extension, assuming the current software version is in use, engineering software, software and documentation on CD, communication through PROFIBUS or the system interface, online diagnostics via PROFIBUS, creating, importing and exporting macros	▶	3ZS1 314-6CC10-0YL5	1	1 unit

Technical specifications

Central units and expansion modules

Type	Central units				Expansion modules							
	Basic	Advanced	ASIsafe basic	ASIsafe extended	4/8F-DI	2/4 F-DI 1/2 F-RO	2/4 F-DI 2F-DO	4/8 F-RO	4 F-DO	8 DI	8 DO	
Dimensions (W x H x D)												
												
• Screw terminals	mm	45 x 111 x 124				22.5 x 111 x 124		45 x 111 x 124		22.5 x 111 x 124		
• Spring-type terminals	mm	45 x 113 x 124				22.5 x 113 x 124		45 x 113 x 124		22.5 x 113 x 124		
Device data												
Shock resistance (sine pulse)	g/ms	15/11										
Touch protection according to EN 50274 and IEC 60529		IP20										
Permissible mounting position		Vertical mounting surface (+10°/-10°), deviating mounting positions are permitted for reduced ambient temperature										
Minimum distances		For heat dissipation through convection from the devices 25 mm to the ventilation openings (top and bottom)										
Permissible ambient temperature												
• During operation	°C	-20 ... +60										
• During storage and transport	°C	-40 ... +85										
Number of sensor inputs (single-channel)												
• Fail-safe		--	--	2	4	8	4	4	--	--	--	--
• Not fail-safe		8	8	6	4	--	--	--	--	8	8	
Number of test outputs		2	2	2	2	2	2	2	--	--	--	
Number of outputs												
• Relay outputs												
- Single channel		--	--	--	--	--	2	--	8	--	--	--
- Two-channel		1	1	1	1	--	--	--	--	--	--	--
• Solid-state outputs												
- Single channel		--	--	--	--	--	--	--	--	--	--	8
- Two-channel		1	1	1	1	--	--	2	--	4	--	--
Weight	g	300	300	300	300	160	160	160	400	135	125	160
Installation altitude above sea level	m	2 000										
Environmental data												
EMC interference immunity		IEC 60947-5-1										
Vibrations												
• Frequency	Hz	5 ... 500										
• Amplitude	mm	0.75										
Climatic withstand capability		IEC 60068-2-78										
Electrical specifications												
Rated control supply voltage U_s according to IEC 61131-2	V	24 DC 15 % ¹⁾										
Operating range		0.85 ... 1.15 x U_s										
Rated insulation voltage U_i	V	300	300	300	300	50	300	50	300	50	50	50
Rated impulse voltage U_{imp}	kV	4	4	4	4	0,5	4	0,5	4	0,5	0,5	0,5
Total current consumption	mA	185	185	185	185	60	85	85	140	8	78	60
Rated power at U_s	W	4.5	4.5	4.5	4.5	1.5	2	2	3	4.8	1.9	1.5
Utilization categories acc. to IEC 60947-5-1 (relay outputs)												
• AC-15 at 230 V	A	2	2	2	2	--	2	--	2	--	--	--
• DC-13 at 24 V (semiconductor outputs)	A	1	1	1	1	--	1	--	1	--	--	--
• DC-13 at 24 V	A	1.5	1.5	1.5	1.5	--	--	1	--	2	--	0.5
Mechanical endurance During rated operation	Operating cycles (relay)	10 x 10 ⁶	10 x 10 ⁶	10 x 10 ⁶	10 x 10 ⁶	--	10 x 10 ⁶	--	10 x 10 ⁶	--	--	--

¹⁾ Device current supply through a power supply unit acc. to IEC 60536 protection class (SELV or PELV).

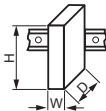
Safety Relays

SIRIUS 3RK3 Modular Safety System

Technical data












Type		Central units				Expansion modules						
		Basic	Advanced	ASIsafe basic	ASIsafe extended	4/8F-DI	2/4 F-DI 1/2 F-RO	2/4 F-DI 2F-DO	4/8 F-RO	4 F-DO	8 DI	8 DO
Electrical specifications (cont.)												
Switching frequency z for rated operational current	1/h	1 000	1 000	1 000	1 000	--	1 000	1 000	360	1 000	--	1 000
Conventional thermal current I _{th}	A	2/1.5	2/1.5	2/1.5	2/1.5	--	1	1	3	2	--	0.5
Protection for output contacts												
Fuse links												
LV HRC Type 3NA, DIAZED Type 5SB, NEOZED Type 5SE												
• Operational class gG	A	4	4	4	4	--	4	--	4	--	--	--
• Operational class quick response	A	6	6	6	6	--	6	--	6	--	--	--
Safety specifications												
Probability of a dangerous failure												
• Per hour (PFH _d)	1/h	5.14 x 10 ⁻⁹	2.8 x 10 ⁻⁹	2.8 x 10 ⁻⁹	2.8 x 10 ⁻⁹	1.89 x 10 ⁻⁹	3.79 x 10 ⁻⁹	2.7 x 10 ⁻⁹	7.15 x 10 ⁻⁹	3.18 x 10 ⁻⁹	--	--
• On demand (PFD)	1/h	1.28 x 10 ⁻⁵	1.7 x 10 ⁻⁴	1.7 x 10 ⁻⁴	1.7 x 10 ⁻⁴	4.29 x 10 ⁻⁶	5.85 x 10 ⁻⁶	8.34 x 10 ⁻⁶	4.36 x 10 ⁻⁵	2.2 x 10 ⁻⁵	--	--
Parameters for cables												
Line resistance		100	100	100	100	100	100	100	--	--	100	--
Cable length from terminal to terminal												
With Cu 1.5 mm ² and 150 nF/km	m	1 000	1 000	1 000	1 000	1 000	1 000	1 000	--	--	1 000	--
Conductor capacity	nF	330	330	330	330	330	330	330	--	--	330	--

Interface and diagnostics modules





















Type	Interface modules		Diagnostics modules
Dimensions (W x H x D)			
			
• Screw terminals	mm	45 x 111 x 124	96 x 60 x 44
• Spring-type terminals	mm	45 x 113 x 124	--
Device data			
Shock resistance (sine pulse)	g/ms	15/11	
Touch protection according to EN 50274 and IEC 60529		IP20	
Permissible mounting position		Vertical mounting surface (+10°/-10°), deviating mounting positions are permitted for reduced ambient temperature	
Minimum distances		For heat dissipation through convection from the devices 25 mm to the ventilation openings (top and bottom)	
Permissible ambient temperature			
• During operation	°C	-20 ... +60	
• During storage and transport	°C	-40 ... +85	
Weight	g	270	90
Installation altitude above sea level	m	2 000	
Environmental data			
EMC interference immunity		IEC 60947-5-1	
Vibrations			
• Frequency	Hz	5 ... 500	
• Amplitude	mm	0.75	
Climatic withstand capability		IEC 60068-2-78	
Electrical specifications			
Rated control supply voltage U_s according to IEC 61131-2	V	24 DC 15 %	24 DC 15 % via connecting cable to the central unit
Operating range		0.85 ... 1.15 x U_s	
Rated insulation voltage U_i	V	50	
Rated impulse voltage U_{imp}	kV	0,5	
Total current consumption	mA	--	24
Rated power at U_s	W	--	0.6

Application

The 3RK3 Modular Safety System can be used for all safety-oriented requirements in the manufacturing industry and offers the following safety functions:

	Symbol	MSS Basic	MSS Advanced, MSS ASIsafe
Monitoring functions			
Universal monitoring Evaluation of any binary signals from single-channel and two-channel sensors		--	✓
EMERGENCY-STOP Evaluation of EMERGENCY-STOP devices with positive-opening contacts		✓	✓
Safety shutdown mats Evaluation of safety shutdown mats with NC contacts and/or cross-circuit detection		✓	✓
Protective door monitoring Evaluation of protective door signals and/or protective flap signals		✓	✓
Protective door interlocking mechanism Evaluation of protective doors with interlocking and locking/unlocking of this device		--	✓
Enabling switches Evaluation of OK buttons with NO contact		✓	✓
Two-hand operator controls Evaluation of two-hand operation consoles		✓	✓
ESPE monitoring Evaluation of electro-sensitive protective equipment such as light arrays and laser scanners		✓	✓
Muting Short-time bridging of electro-sensitive protective equipment, 2/4 sensors in parallel, 4 sensors sequentially		--	✓
Operating mode selector switches Evaluation of operating mode selector switches with NO contacts		✓	✓
Monitoring of AS-i (AS-i 2F-DI) Logic element for monitoring of AS-i input slaves		--	✓

✓ Available
-- Not available

	Symbol	MSS Basic	MSS Advanced, MSS ASIsafe
Logic operation functions			
AND		✓	✓
OR		✓	✓
XOR		✓	✓
NAND		✓	✓
NOR		✓	✓
Negation		✓	✓
Flip-flop		✓	✓
Counter functions			
Counter 0 -> 1		✓	✓
Counter 1 -> 0		✓	✓
Counter 0 -> 1/1 -> 0		✓	✓
Timer functions			
With ON-delay		✓	✓
Passing make contact		✓	✓
With OFF-delay		✓	✓
Clock pulsing		✓	✓
Start functions			
Monitored start		✓	✓
Manual start		✓	✓
Output functions			
Standard output		✓	✓
F output		✓	✓
AS-i output function		--	✓
Status functions			
Element status		--	✓

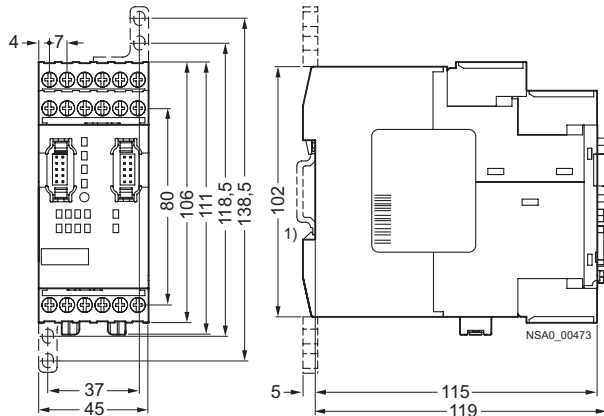
Safety Relays

SIRIUS 3RK3 Modular Safety System

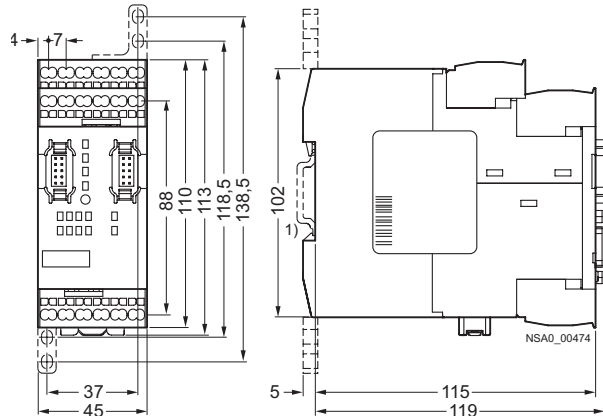
Dimensional drawings

Dimensional drawings

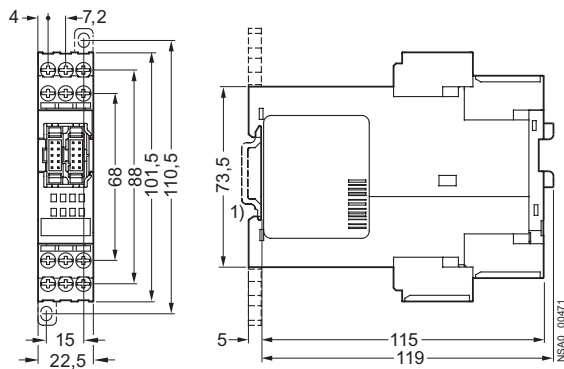
Central module with screw terminals



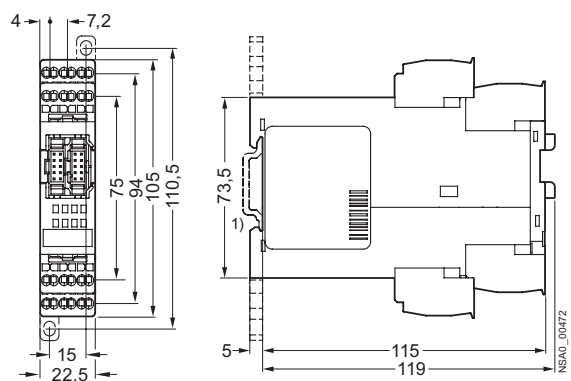
Central module with spring-type terminals



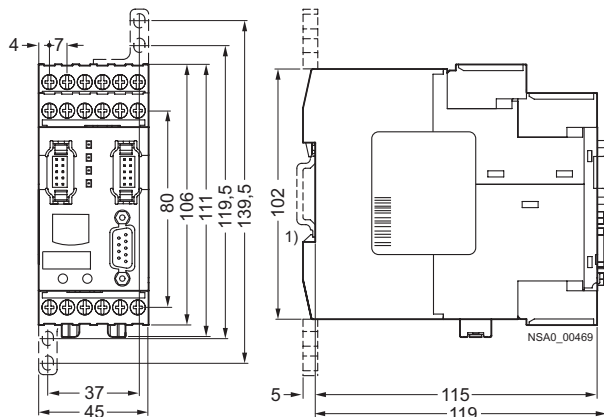
Expansion module with screw terminals



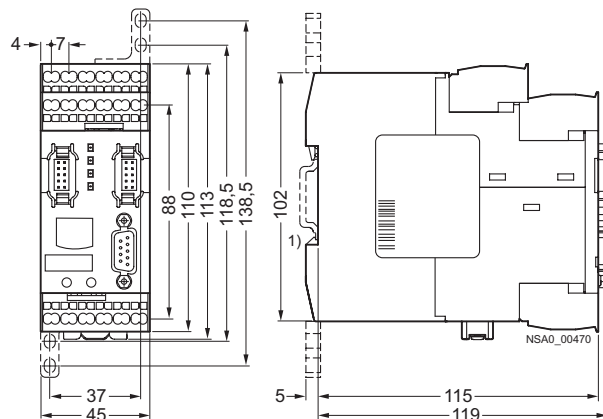
Expansion module with spring-type terminals



Interface module with screw terminals



Interface module with spring-type terminals



¹⁾ For standard mounting rail TH 35 according to EN 60715.

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3RA24	Contactors Assemblies for Wye-Delta Starting
3RA27	Contactors Function Modules for AS-Interface
3RA6	Compact Starter
3RG783	SIMATIC FS600 Laser Scanner
3RK11	Safety Monitor, Analog I/O Modules
3RK12	Compact Safety Modules, I/O Modules, Counter Modules, Communication Modules
3RK13	Enclosed Motor Starters
3RK14	Compact Safety Modules, I/O Modules, Communication Modules, Ground Fault Protection Modules, Connections for LOGO!
3RK19	Accessories
3RK22	I/O Modules
3RK24	I/O Modules, Communication Modules
3RK27	ASI System Manual
3RK31	DP/AS-i F-Link
3RK43	MCU Enclosed Motor Starters
3RV19	Accessories for Compact Starter
3RX90	ASI Shaped Cables
3RX95	ASI Power Supplies
3S83	E-Stop Components
3SE50	Position Switches & Interlock Accessories
3SF1	Position Switches & Key Interlock Switches
3SF2	Cable Operated Switches
3SF54	F Adapters for E-Stops
3SF55	AS-i Slaves for Pilot Devices
3SF58	Pilot Device Stations, Front Panel Module
3SF59	Pilot Device Accessories
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Siemens complete IO-Link offering is found in [Section 7 of the Siemens IK PI 2012 Catalog](#).

In this section you will find the Table of Contents for Section 7 of the Siemens IK PI 2012 catalog and overview information on IO-Link.

A PDF version of Section 7 on IO-Link can be viewed from the Siemens' on-line version of this 2014 Industrial Controls Catalog.

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As-Interface

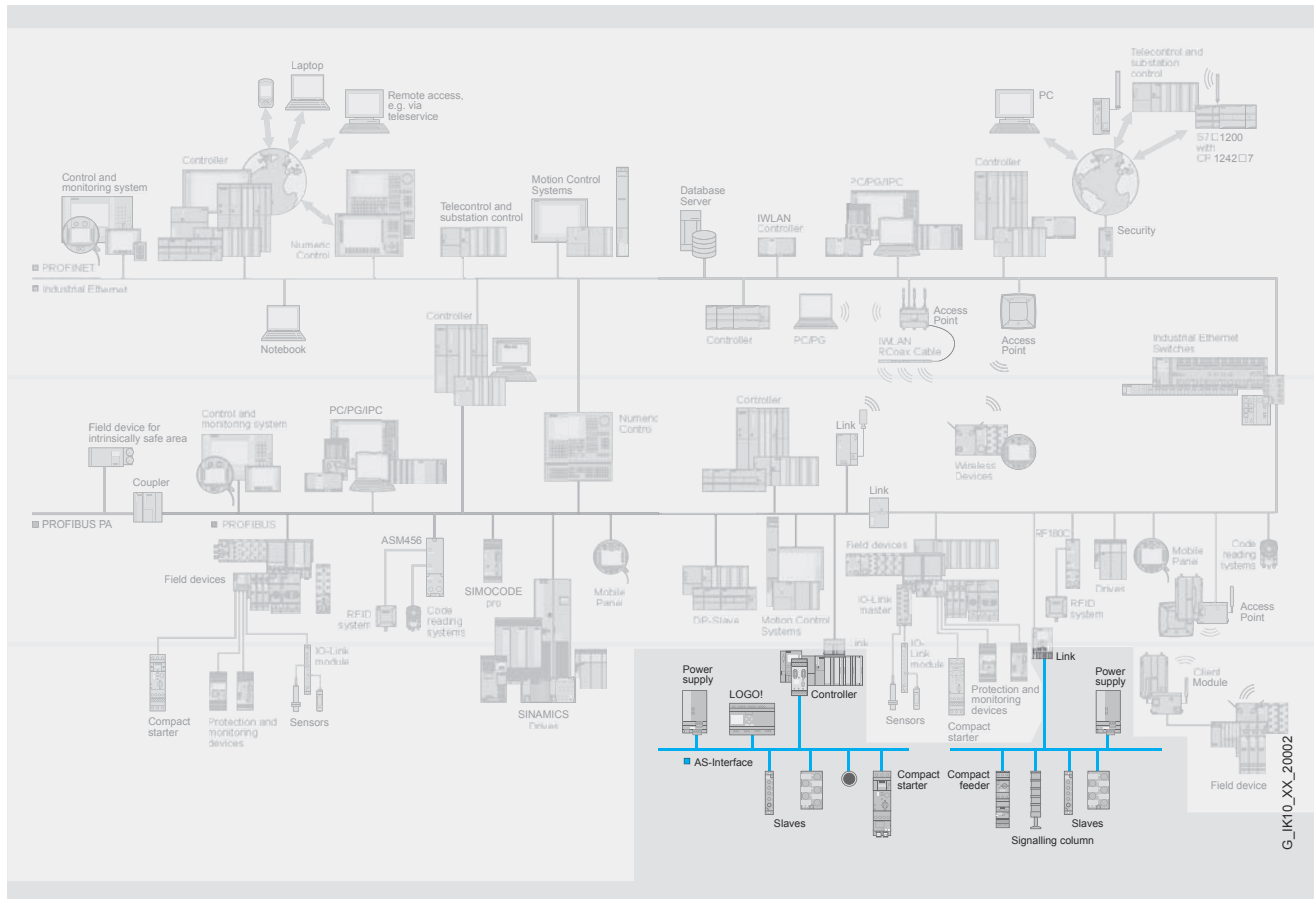
Introduction

Communication overview

Overview

AS-Interface is an open, international standard according to EN 50295 and IEC 62026-2 for process and field communication. Leading manufacturers of actuators and sensors all over the world support the AS-Interface. Interested companies are provided with the electrical and mechanical specifications by the AS-Interface Association.

AS-Interface is a single master system. For automation systems from Siemens, there are communications processors (CPs) communications modules (CMs) and routers (links) that control the process or field communication as masters, and actuators and sensors that are activated as AS-Interface slaves.



Benefits

A key feature of AS-Interface technology is the use of a shared two-conductor cable for data transmission and the distribution of auxiliary power to the sensors/actuators. A power supply unit which meets the requirements of the AS-Interface transmission method and has an external data decoupling module if required is used for the distribution of auxiliary power. The AS-Interface cable used for the wiring is mechanically coded and hence protected against polarity reversal and can be easily contacted by the insulation piercing method.

Elaborately wired control cables in the control cabinet and marshalling racks can be replaced by AS-Interface.

The AS-Interface cable can be connected to any points thanks to a specially developed cable and connection by the insulation piercing method.

With this concept you become extremely flexible and achieve high savings.

Application

I/O data exchange

The AS-i master transmits automatically the inputs and outputs between the control system and the digital and analog AS-Interface slaves.

Slave diagnostics information is forwarded to the control system when required.

AS-Interface masters according to the AS-Interface Specification V2.1 or V3.0 support integrated analog value processing. This means that data exchange with analog AS-Interface slaves is just as easy as with digital slaves.

Command interface

In addition to I/O data exchange with binary and analog AS-Interface slaves the AS-Interface masters provide a number of other functions through the command interface.

Hence it is possible, for example, for slave addresses to be issued, parameter values transferred or configuration information read out from user programs.

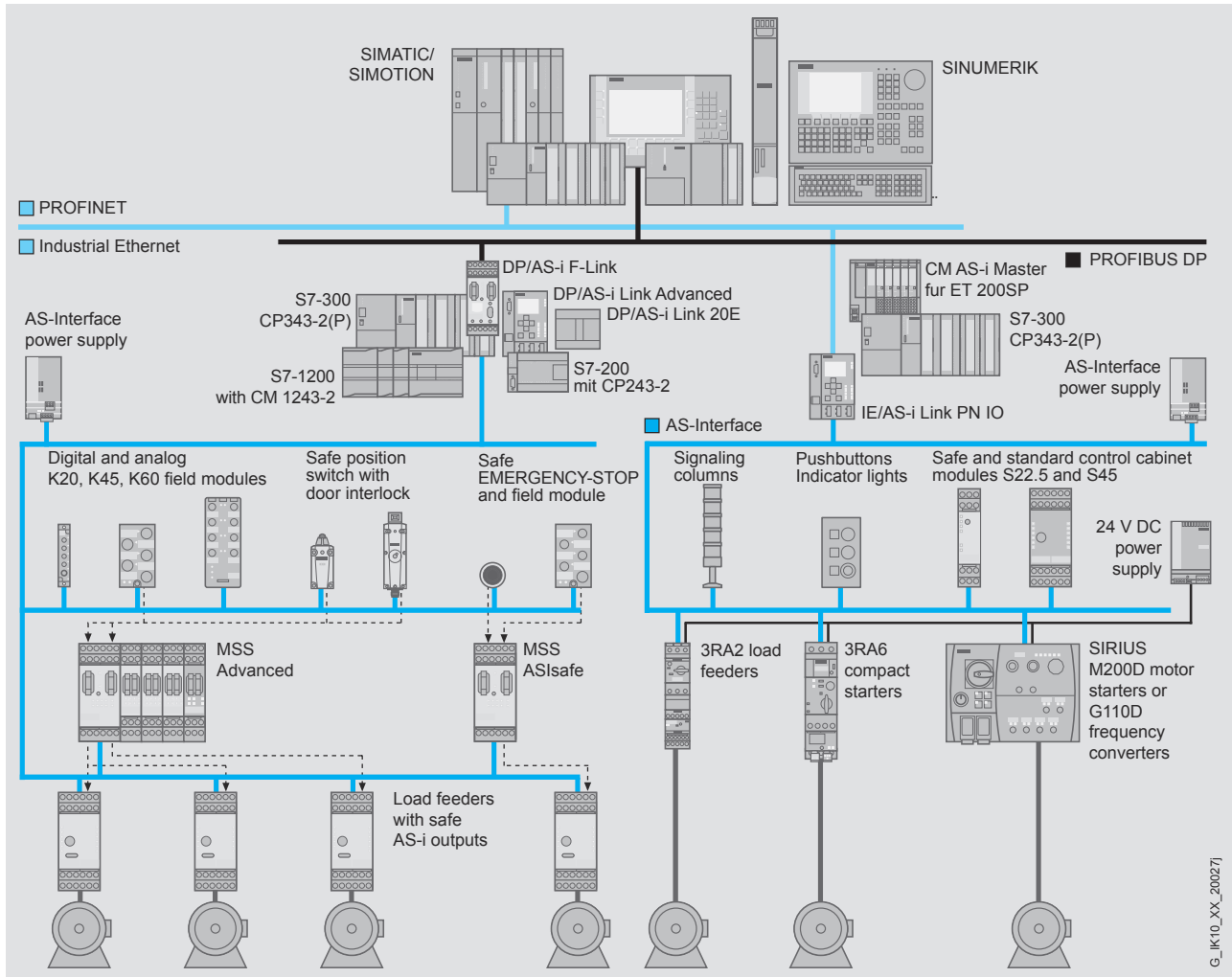
You can find more information on the Internet, see <http://support.automation.siemens.com/WW/view/en/51678777>

Overview

To implement communication, a system installation has the following main components:

- Master interface modules for central control units such as SIMATIC S7, ET 200 distributed peripherals, or routers from PROFIBUS/PROFINET to AS-Interface
- Power supply units, if required in combination with a data decoupling module for the power supply to the slaves
- AS-Interface shaped cables

- Network components such as repeaters and extension plugs (cannot be used for AS-i Power24V)
- Modules for connection of standard sensors/actuators
- Actuators and sensors with integrated AS-i slave
- Safety modules for transmitting safety-oriented data through AS-Interface
- Addressing units for setting the slave addresses during commissioning



Example of a configuration with the system components

Features

Standard	EN 50295 / IEC 62026-2	Maximum cycle time	<ul style="list-style-type: none"> • 5 ms in full expansion with standard addresses • 10 ms in full expansion with A/B addresses, profile-specific for Spec 3.0 slaves
Topology	Line, star or tree structure (same as electrical wiring)	Number of stations per AS-Interface line	<ul style="list-style-type: none"> • 31 slaves acc. to AS-Interface Spec. V2.0 • 62 slaves (A/B technology) acc. to AS-Interface Spec. V2.1 and V3.0 • Integrated analog value transmission
Transmission medium	Unshielded two-wire cable (2 x 1.5 mm ²) for data and auxiliary power	Number of binary sensors and actuators	<ul style="list-style-type: none"> • Max. 124 DI/124 DO according to Spec. V2.0 • Max. 248 DI/186 DO according to Spec. V2.1 • Max. 496 DI/496 DO according to Spec. V3.0
Connection methods	Contacting of the AS-Interface cable by insulation piercing method	Access control	<ul style="list-style-type: none"> • Cyclic polling master/slave procedure • Cyclic data acceptance from host (PLC, PC)
Maximum cable length	<ul style="list-style-type: none"> • 100 m without repeater • 200 m with extension plug • 300 m with two repeaters in series connection • 600 m with extension plugs and two repeaters connected in parallel <p>Larger cable lengths are also possible when additional repeaters are connected in parallel</p>	Error safeguard	Identification and repetition of faulty message frames

Overview

Scope of the AS-Interface specification

AS-Interface Specification	Maximum number of slaves			Number of digital inputs	Number of digital outputs
	Digital	Analog	ASIsafe	DI	DO
Version 2.0	31	31	31	$31 \times 4 = 124$	$31 \times 4 = 124$
Version 2.1	62	31	31	$62 \times 4 = 248$	$62 \times 3 = 186$
Version 3.0	62	62	31	$62 \times 8 = 496$	$62 \times 8 = 496$

Basic data of AS-Interface Specification 2.0

- AS-Interface Specification 2.0 describes a fieldbus system with an AS-i master and up to 31 AS-i slaves.
- Each AS-i slave has up to 4 digital inputs and 4 digital outputs.
- With full expansion, the complete transmission of all input/output data requires max. 5 ms cycle time.

Expansions of AS-Interface Specification 2.1

AS-Interface Specification 2.1 enables the number of network stations to be doubled from 31 to 62 as follows:

- The standard slaves continue to occupy one AS-i address (1...31).
- Slaves with extended addressing divide an address into an A address (1A...31A) and a B address (1B...31B). Up to 62 A/B slaves can be connected accordingly to one AS-Interface network.
- Mixed operation of standard slaves and A/B slaves is possible without difficulty. The AS-i master identifies automatically which type of slave is connected. No special adjustments are required of the user.

Another function of the AS-Interface Specification V2.1 is the integrated analog value transmission function. Access to both analog values and digital values is possible without the need for any special function blocks.

Expansions of AS-Interface Specification 3.0

- AS-Interface Specification 3.0 enables the connection of nearly 1000 digital inputs/outputs (profile S-7.A.A: 8DI/8DO as A/B slave).
- New profiles have also enabled the option of expanded addressing for analog slaves.
- Acceleration of analog value transmission through "Fast Analog Profile".
- Variable use of analog modules: Optional parameterization of resolution (12/14 bit) and 1- and 2-channel capability.
- Asynchronous serial protocol 100 baud or 50 baud, bidirectional.

AS-Interface master for A/B slaves

To be able to operate A/B slaves on an AS-Interface network you must use master modules that meet the minimum requirements of Specification 2.1.

AS-Interface specification	Available masters
Version 2.1	CP 243-2 (S7-200)
Version 3.0	CP 343-2, 343-2P (S7-300 / ET 200M), DP/AS-i Link Advanced, DP/AS-i F-Link, DP/AS-Interface Link 20E, IE/AS-i Link PN IO, CM 1243-2 (S7-1200), CM AS-i Master ST for ET 200SP new

The AS-Interface specification relevant for the respective slave is noted in the "Selection and ordering data".

For the exact slave profile [see AS-Interface system manual](#).

Communication cycle

AS-Interface specification	Maximum cycle time (digital signals)
Version 2.0	5 ms
Version 2.1	5 ms with 31 slaves 10 ms with 62 slaves
Version 3.0	5 ms with 31 slaves 10 ms with 62 slaves, supplementary, up to 20 ms with A/B slaves using 4DI/4DO, up to 40 ms with A/B slaves using 8DI/8DO

Each address is queried in max. 5 ms cycle time. If two A/B slaves are operated on one basic address (e.g. 12A and 12B), a maximum 10 ms will be required for updating the data of both slaves.

All slave types can be mixed and used on a single AS-Interface network.

More information, e.g. whether an AS-Interface slave is a standard slave or an A/B slave, [can be seen in the section "Selection and ordering data" or the "AS-Interface system manual"](#).

More information

AS-Interface system manual

More information is available in the AS-Interface system manual.

The German AS-Interface system manual can be downloaded free of charge, [see http://support.automation.siemens.com/WW/view/en/26250840](http://support.automation.siemens.com/WW/view/en/26250840)

The English AS-Interface system manual can be downloaded free of charge, [see http://support.automation.siemens.com/WW/view/en/26250840](http://support.automation.siemens.com/WW/view/en/26250840)

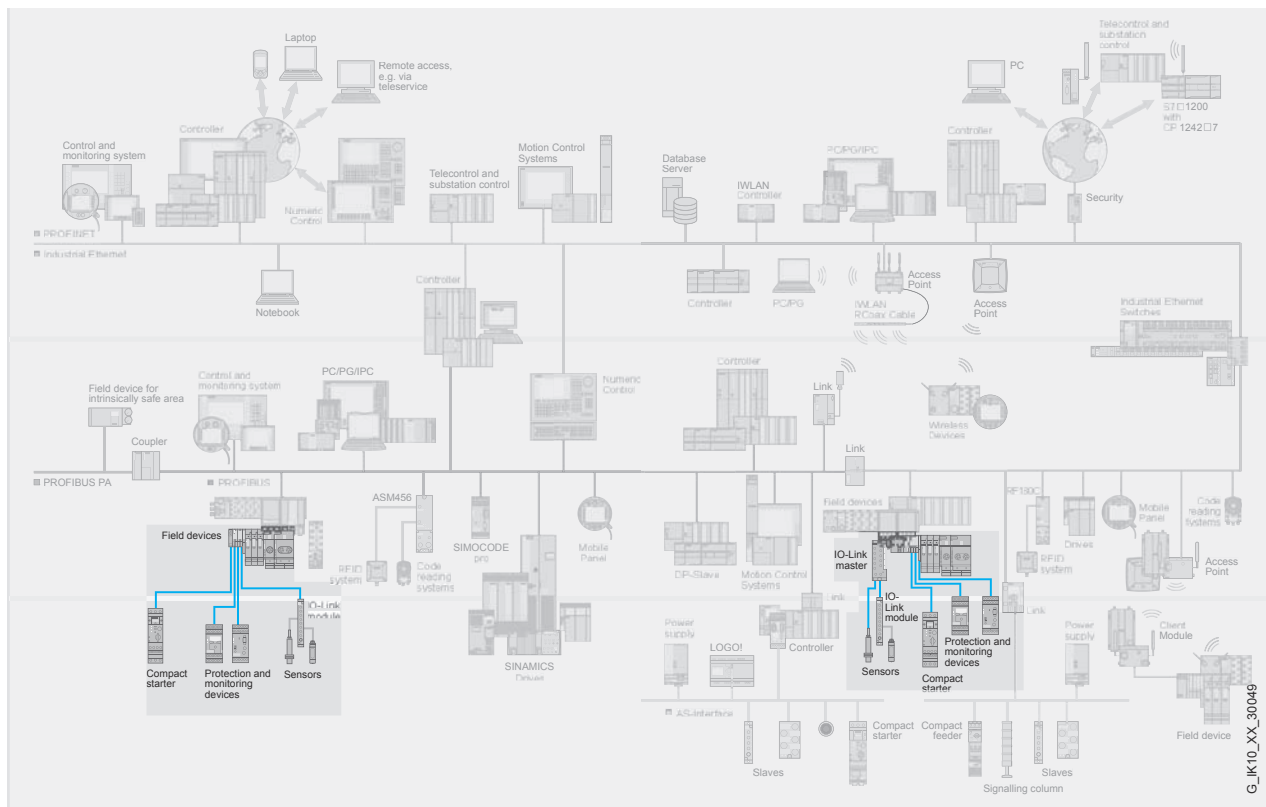
A print version of the AS-Interface system manual is also available under the following order number.

- German 3RK2 703-3AB02-1AA1
- English 3RK2 703-3BB02-1AA1

Overview

IO-Link is an open communication standard for sensors and actuators - defined by the Profibus User Organization (PNO). IO-Link technology is based on the point-to-point connection of sensors and actuators to the control system.

Parameter and diagnostics data are transmitted in addition to the cyclic operating data for the connected sensors/actuators. The simple, unshielded three-wire cable customary for standard sensors is used for this purpose.



Benefits

Engineering

- Standardized, open system for greater flexibility (non-Siemens IO-Link devices can be integrated in engineering)
- Uniform, transparent configuring and programming through integrated engineering (SIMATIC STEP 7)
- Unassigned SIMATIC function blocks for easy parameterization, diagnostics and read-out of measured values
- Efficient engineering thanks to pre-integration into SIMATIC HMI
- Low error rate in CAD circuit diagram design as a result of reduced control current wiring

Installation and commissioning

- Faster assembly with minimized error rate as a result of reduced control current wiring
- Less space required in the control cabinet
- Low-cost circuitry where there are several feeders by making full use of existing components

Operation and maintenance

- High transparency in the system right down to field level and integration into power management systems
- Reduction in downtimes and maintenance times thanks to system-wide diagnostics and faster fault correction
- Support of predictive maintenance
- Shorter changeover times, even for field devices, by means of parameter and recipe management

Application

IO-Link can be used in the following main applications:

- Easy connection of complex IO-Link sensors/actuators with a large number of parameters and diagnostic data to the control system
- Replacement of sensor boxes for connecting binary sensors with the IO-Link input modules optimized in terms of cabling
- Optimized cable connection of switching devices to the control system
- Simple transmission of energy values from the device to the control system for integration into a user program or power management

In these cases, all the diagnostics data are transmitted to the higher-level control system through IO-Link. The parameter settings can be changed during operation. Central data storage means that it is possible to exchange an IO-Link sensor/actuator without a PC or programming device.

Integration in STEP 7

Integration of the device configuration in the STEP 7 environment guarantees:

- Quick and easy engineering
- Consistent data storage
- Quick localization and rectification of faults

IO-Link

Introduction

System components

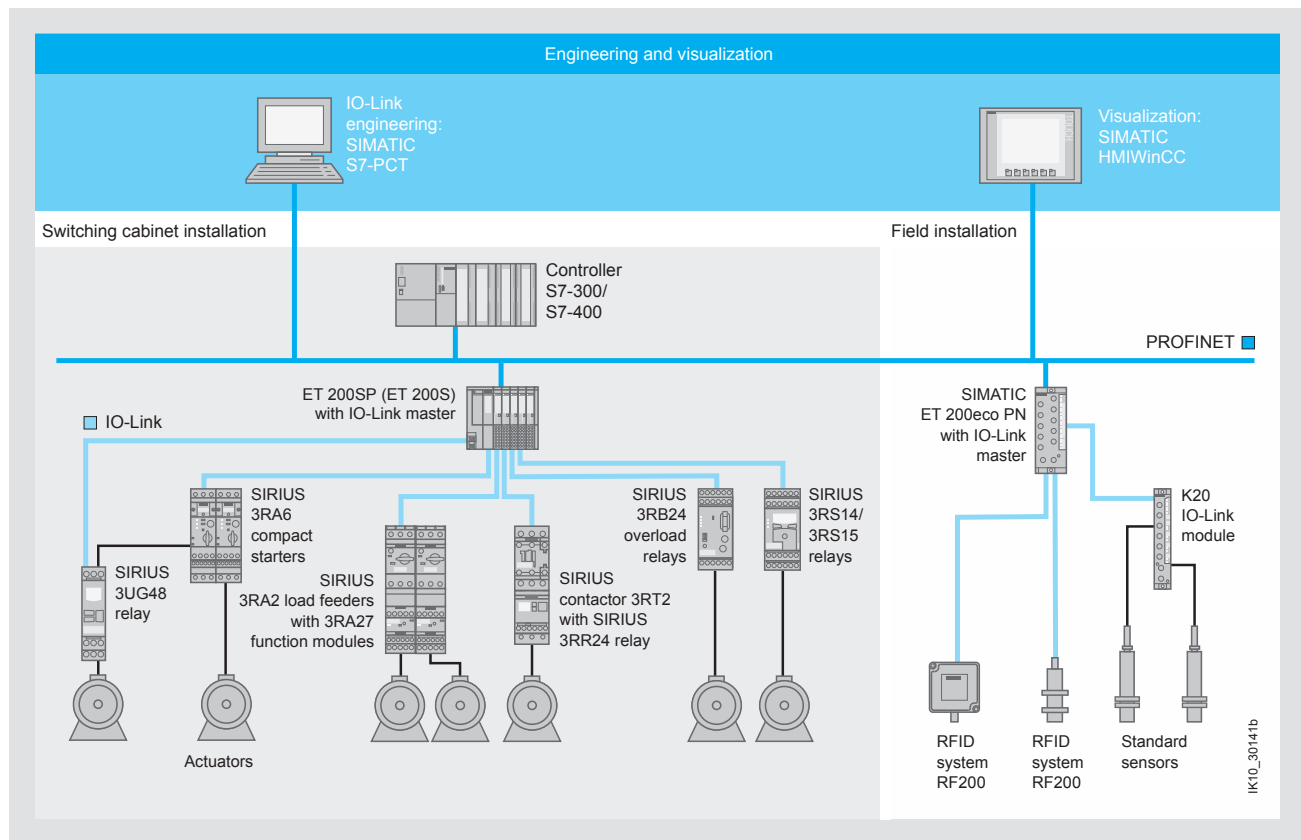
Overview



IO-Link product family

To implement communication, a system installation has the following main components:

- An IO-Link master
- Several IO-Link devices, usually sensors (RFID systems), actuators or combinations of these
- A standard 3-wire sensor/actuator cable



Example of a configuration with the system components

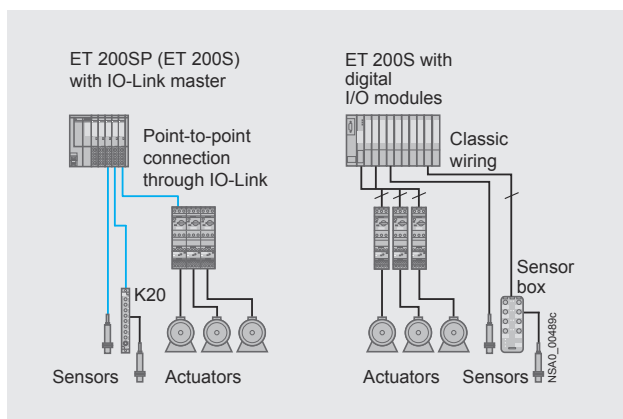
Compatibility of IO-Link

IO-Link guarantees compatibility between IO-Link-capable modules and standard modules as follows:

- IO-Link sensors can be operated both on IO-Link modules (masters) and standard input modules.
- IO-Link sensors/actuators as well as today's standard sensors/actuators can be used on IO-Link masters.
- If conventional components are used in the IO-Link system, then of course only the standard functions are available at this point.

Load feeders and motor starters

Through IO-Link it is possible to control not only sensors but also actuators in the form of load feeders and motor starters.



Possibilities for connecting load feeders and motor starters to IO-Link or in the conventional way

Analog signals

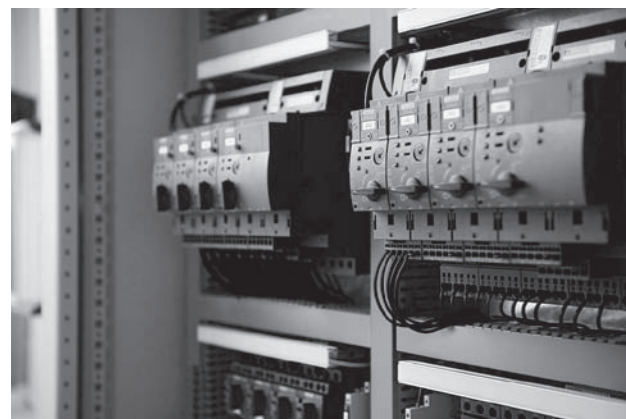
Another advantage of IO-Link technology is that analog signals are digitized already in the IO-Link sensor itself and are digitally transmitted by the IO-Link communication. As the result, faults are prevented and there is no extra cost for cable shielding.

Enhanced through IO-Link input modules

IO-Link compatibility also permits connection of standard sensors/actuators, i.e. conventional sensors/actuators can also be connected to IO-Link. This is particularly effective with the IO-Link input modules, which allow several sensors to be connected at one time via a cable to the controller.

Grouping of motor starters

The SIRIUS controls allow four starters to be combined to form a group.



Connection of a motor starter group made up of three 3RA64 direct-on-line starters and a 3RA65 reversing starter

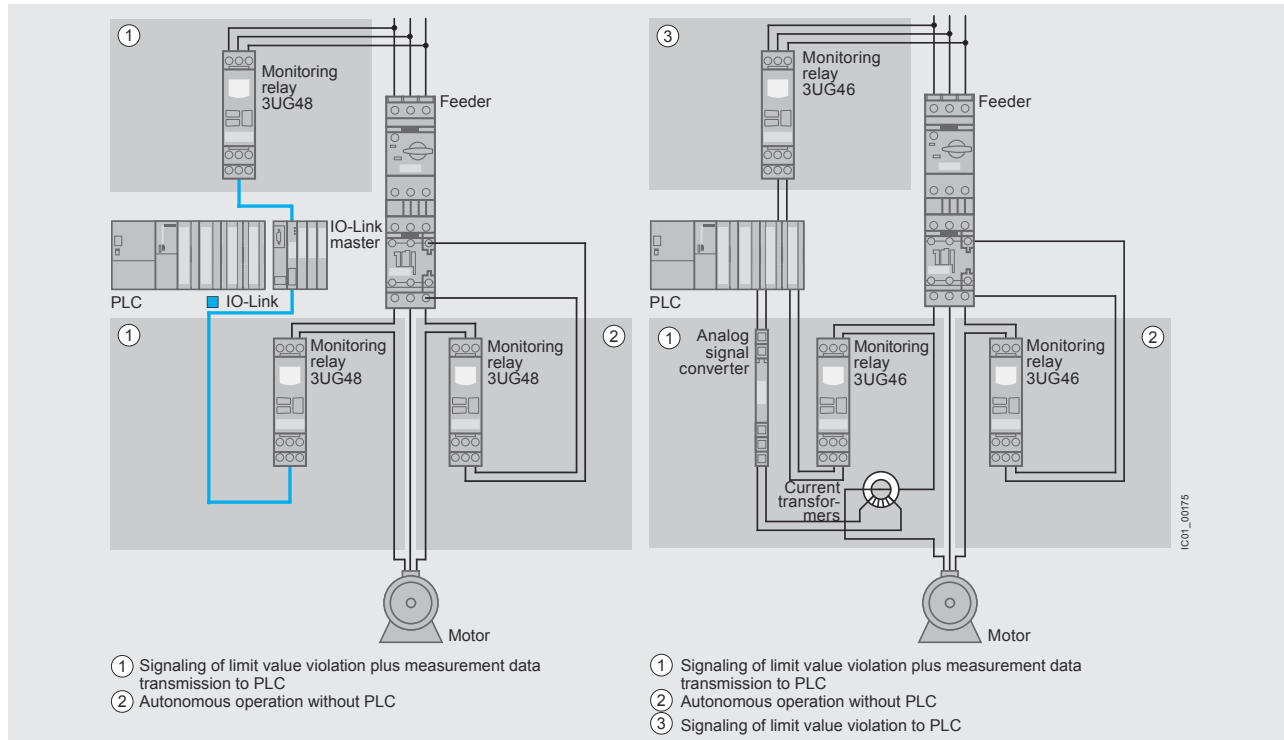
In this way up to 16 starters can be operated on a single IO-Link master. This leads to a reduction in the installation space and control wiring required.

System components

Overload and monitoring relays

By combining overload/monitoring relays with IO-Link it is now possible to send data that has already been recorded and

evaluated in the monitoring relays directly to the controller. This avoids the use of duplicated sensors.

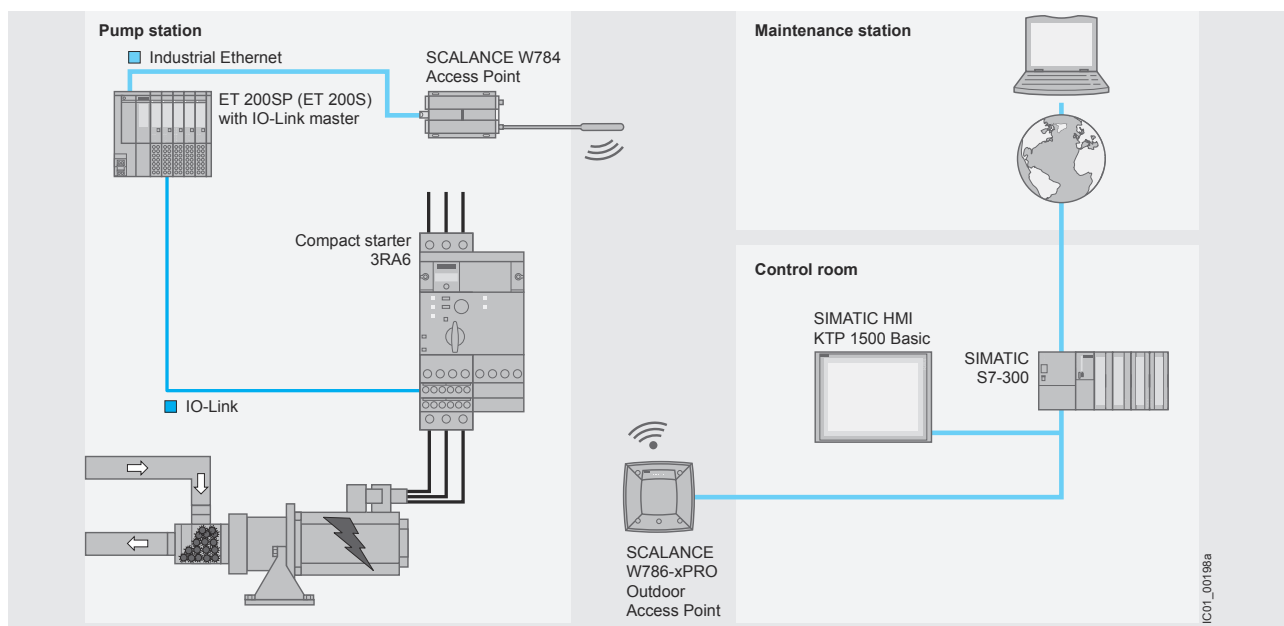


Possibilities for connecting overload relays to IO-Link or in the conventional way

Wireless communication

Using an upstream IWLAN client module, such as SCALANCE W746-1PRO, allows IO-Link to be integrated into the PROFINET world via a distributed I/O. Possible uses include acting as an alternative to fault-prone cable carrier or collector wire technology. The individual diagnostics options offered by

the various IO-Link devices provide greater transparency for the production process. Just like the parameter data for a device, these diagnostics data can be evaluated remotely using the possibilities offered by SIMATIC. This supports remote maintenance down to the lowest level in the field.



Wireless communication between Industrial Ethernet and IO-Link components

IO-Link components

IO-Link master, software, cables



CM 4x IO-Link
for ET 200SP

Masters

IO-Link master modules for ET 200SP

- CM 4x IO-Link

IO-Link master modules for ET 200S

- IO-Link 4SI electronic module
- SIRIUS 4SI electronic modules

IO-Link master modules for ET 200eco PN

Software

STEP 7 PCT

Engineering software for configuring the IO-Link master modules for ET 200SP, ET 200S and ET 200eco

- Available as a stand-alone version or integrated into STEP 7 (Version 5.5 SP1 or later)
- Retrieving parameter and diagnostics data from the IO-Link devices connected to the master
- Monitoring of the process image of the IO-Link devices
- Open interface for importing further IODDs
- Freely available for download from Industry Online Support¹⁾

IO-Link Call function block

STEP 7 function block for easy acyclical data exchange in the user program

- Freely available for download from Industry Online Support²⁾

WinCC flexible template project

Easy integration of IO-Link devices into the user program by using ready-made WinCC flexible templates

- Freely available for download from Industry Online Support³⁾

IODD files

IO-Link Device Description (IODD) files provide the device description for IO-Link

- Comprehensive IODD catalog of SIEMENS IO-Link devices
- Freely available for download from Industry Online Support⁴⁾

Cable

3-wire standard cable

IO-Link devices



K20 input module

Detection with IO-Link

IO-Link input modules

K20 input module

- 4 inputs, M12 connections
- 8 inputs, standard M8 connections

IO-Link devices (continued)



SIMATIC RF210R,
SIMATIC RF220R,
SIMATIC RF260R

IO-Link RFID systems

SIMATIC RF200 RFID system in the HF range

- SIMATIC RF210R, SIMATIC RF220R, SIMATIC RF260R products
- Simple identification tasks (read-only), such as reading an ID number
- No RFID-specific programming, ideal for those new to RFID
- Simple connection via master modules for IO-Link, such as SIMATIC ET 200S and ET 200eco
- Use with the tried and tested ISO 15693 transponders (MOBY D)

Switching with IO-Link

Contactors and contactor assemblies

Power contactors for switching motors

- SIRIUS 3RT2 contactors, 3-pole, up to 18.5 kW
- Contactor assemblies
- SIRIUS 3RA23 reversing contactor assemblies
- SIRIUS 3RA24 contactor assemblies for wye-delta starting
- SIRIUS 3RA27 function modules for IO-Link
- For direct-on-line starters, reversing starters and wye-delta starters

See chapter 2

Motor starters for use in the control cabinet

SIRIUS 3RA6 compact starters

- 3RA64 direct-on-line starters
- 3RA65 reversing starters
- Infeed systems for 3RA6

See chapter 4

Contactors with IO-Link

Overload relays

SIRIUS 3RB24 solid-state overload relays for IO-Link

- Evaluation module
- Current measuring modules from 0.3 to 630 A
- Controlling direct-on-line, reversing and star-delta starters via IO-Link in conjunction with contactors
- Full motor protection
- Diagnostics and current value transmission via IO-Link

See chapter 3

Monitoring with IO-Link

Monitoring relays

SIRIUS 3UG48 monitoring relays for IO-Link

- Monitoring voltage, current, power, speed or p.f. according to device design
- ON-delay and tripping delay time can be adjusted

See chapter 11

SIRIUS 3RS14, 3RS15 temperature monitoring relays for IO-Link

- Temperature monitoring with connected sensors
- Two limit values, can be adjusted separately

See chapter 11

SIRIUS 3RR24 monitoring relays for IO-Link

- Monitoring of current, phase failure, open circuit and phase sequence
- Designed for mounting on 3RT2 contactors

See chapter 2



SIRIUS 3RA27 11
function module for
IO-Link



SIRIUS 3RA64
direct-on-line
starter



SIRIUS 3RB24
overload relays



SIRIUS 3UG48
monitoring relays



SIRIUS 3RS14
temperature moni-
toring relays



SIRIUS 3RR24
monitoring relays

¹⁾ <http://support.automation.siemens.com/DE/view/en/37936752>

²⁾ <http://support.automation.siemens.com/DE/view/en/38487085>

³⁾ <http://support.automation.siemens.com/DE/view/en/38006560>

⁴⁾ <http://support.automation.siemens.com/DE/view/en/29801139/133100>

Overview

Principles of the IO-Link specification

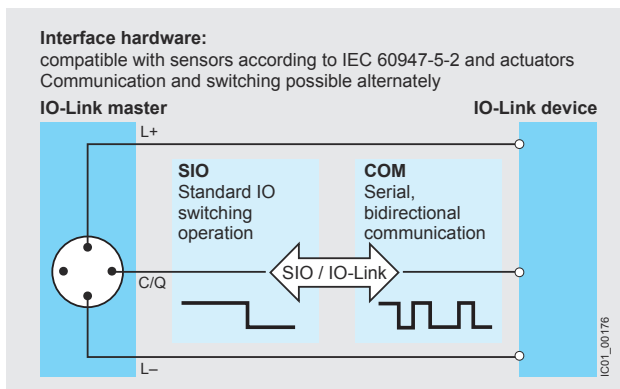
According to the IO-Link specification, communication functions as follows:

- Transmission takes place via an unshielded three-wire cable no more than 20 m long, of the kind normally used for standard sensors.
- Analog values which have already been digitized are transmitted in the form of message frames, which may correspond to +/- 10 V or 4 to 20 mA.
- Digital communication from 0 to 24 V on the so-called C/Q cable
- Most of the values transmitted are measured values from the sensors which include the units.
- The sensors and actuators are described by the IO-Link Device Description (IODD).
- While the IO-Link specification permits an infinite number of ports, an IO-Link master currently only supports four ports. Only one IO-Link device (slave) can be connected to each port (point-to-point connection).
- Transmission parameters between IO-Link master and the devices: 1 start bit, 8 data bits, 1 parity bit and 1 stop bit.
- The transmission rates between IO-Link master and the devices are as follows:
 - via COM1: 4 800 bps
 - via COM2: 38 400 bps
 - via COM3: 230 400 bps
- The average cycle time is 2 ms for the reading/writing of 16 data bits at a transmission rate of 38 400 bps.

IO-Link protocol

For the dialog between device and master, IO-Link uses a standard protocol, the standard asynchronous communication interface (UART) in "semi-duplex" mode.

The IO-Link protocol supports both the Standard IO mode (SIO) and the IO-Link communication mode (COM).



The structure of the protocol and its message frames depends on the types of data to be transmitted.

Data types

In the IO-Link specification a distinction is made between the following data types:

Process data

The process data of the devices are transmitted cyclically in a data frame, provided the process data width does not exceed 2 bytes. In the case of larger process data widths up to 32 bytes, parts are transmitted one after the other in several cycles. As of Version V1.1 of the specification, up to 32 bytes of process data can be transferred in a single cycle.

Service data (SD)

With the aid of the service data, parameter values or device statuses can be read out. It is also possible to write the parameter values or transmit commands via the service data. Service data are always exchanged acyclically and in response to an inquiry from the IO-Link master.

Events

Via events it is possible to transmit device events or statuses such as contamination, overheating, short circuits etc., from the device via the IO-Link master to the PLC or to visualize them.

The events are sent on the initiative of the devices via the "event flag", which the master evaluates. The master itself can also generate events.

Three categories of event are defined:

- Error signals (errors)
- Maintenance data (warnings)
- Device functions (notifications)

M-sequence (message frames)

Parameter data, events and process data can be transmitted either in an M-sequence (message frame) or in separate M-sequences (message frame).

Data storage

As of Specification V1.1, a data storage concept has been created for IO-Link. In this concept, the IO-Link device initiates the storage of its data on a higher-level parameter server. In the event that a device is replaced, the parameter server can restore the original parameterization. It is therefore possible to replace the devices without re-parameterization.

The IO-Link master can contain the parameter server. The parameter server can also be implemented centrally in the PLC or in a system server. In this case the IO-link master passes on the corresponding information.

IO-Link master

The IO-Link master is the interface to higher-level control systems. The IO-Link master presents itself as a normal fieldbus node, and is integrated into the appropriate network configurator via the relevant device description (e.g. GSD, FDCML, EDS etc.).

IO-Link Device Description (IODD)

The IO-Link Device Description (IODD) has been defined to provide a full, transparent description of system characteristics as far as the IO-Link device. It is based on the open XML standard.

The IODD contains information on communication characteristics, device parameters, identification, process and diagnostics data, and is supplied by the manufacturer. The design of the IODD is the same for all devices from all manufacturers, and is always presented in the same way by the IODD Interpreter Tools. This therefore ensures that the handling is the same for all IO-Link devices, whatever the manufacturer.

New in IO-Link specification 1.1

The IO-Link specification is currently available in Version 1.1, and is currently standardized as IEC 61131-9 (CDV).

Specification 1.1 offers the following new features compared with the previous specification 1.0:

- New variable M-sequences allow transmission of up to 32 bytes of process or service data in a single cycle.
- Data storage concept

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LOGO! logic module

Introduction

LOGO! logic module

Overview



LOGO! logic module

- The compact, easy-to-use and low-cost solution for simple control tasks
- Compact, easy to operate, universally applicable without accessories
- "All in one": Integrated display and operator panel
- 36 different functions can be connected at the click of a button or by means of PC software; up to 130 times over
- Functions are easily changed at the press of a key.
No more time-consuming rewiring

Overview



- The space-saving basic variants
- Interface for the connection of expansion modules, up to 24 digital inputs, 16 digital outputs, 8 analog inputs and 2 analog outputs can be addressed
- With connection option for LOGO! text display TD (can be connected to all LOGO! 0BA6 basic variants)

New in LOGO! 0BA7 variants:

- Ethernet interface for communication with SIMATIC Controller, SIMATIC Panel and PC
- Networking of max. 8 LOGO! devices
- Use of standard SD card or SIMATIC memory card

Ordering data

Order No.

LOGO! logic module 24C

24 V DC power supply,
8x 24 V DC digital inputs,
of which 4 can be used in analog
mode (0 to 10 V),
4x 24 V DC digital outputs,
0.3 A, integral time switch;
200 function blocks can
be interlinked,
modular expansion capability

6ED1 052-1CC01-0BA6

LOGO! logic module 12/24RC

12/24 V DC power supply,
8x 12/24 V DC digital inputs, of
which 4 can be used in analog
mode (0 to 10 V)
4x 10 A relay outputs,
integral time switch;
200 function blocks can
be interlinked,
modular expansion capability

6ED1 052-1MD00-0BA6

LOGO! logic module 24RC

24 V AC/DC power supply,
8x 24 V AC/DC digital inputs,
4x 10 A relay outputs,
integral time switch;
200 function blocks can
be interlinked,
modular expansion capability

6ED1 052-1HB00-0BA6

LOGO! logic module 230RC

115/230 V AC/DC power supply,
8x 115/230 V AC/DC digital inputs,
4x 10 A relay outputs,
integral time switch;
200 function blocks can
be interlinked,
modular expansion capability

Order No.

6ED1 052-1FB00-0BA6

LOGO! logic module 12/24RCE

12/24 V DC power supply,
8x 12/24 V DC digital inputs, of
which 4 can be used in analog
mode (0 to 10 V)
4x 10 A relay outputs,
integral time switch;
400 function blocks can
be interlinked,
Ethernet interface,
modular expansion capability

6ED1 052-1MD00-0BA7

LOGO! logic module 230RCE

115/230 V AC/DC power supply,
8x 115/230 V AC/DC digital inputs,
4x 10 A relay outputs,
integral time switch;
400 function blocks can
be interlinked,
Ethernet interface,
modular expansion capability

6ED1 052-1FB00-0BA7

LOGO! logic module

LOGO! modular

LOGO! modular basic variants

Ordering data	Order No.		Order No.
Accessories		LOGO! PC cable	6ED1 057-1AA00-0BA0
LOGO! TD text display 4-line text display, can be connected to all LOGO! 0BA6 Basic and Pure versions, including connecting cable	6ED1 055-4MH00-0BA0	For program transfer between LOGO! and the PC	
LOGO! Manual		LOGO! USB PC cable	6ED1 057-1AA01-0BA0
German	6ED1 050-1AA00-0AE8	For transferring the program between LOGO! and PC, including driver on CD-ROM	
English	6ED1 050-1AA00-0BE8	LOGO! modem cable	6ED1 057-1CA00-0BA0
French	6ED1 050-1AA00-0CE8	Adapter cable for analog modem communication	
Spanish	6ED1 050-1AA00-0DE8	Front panel mounting set	
Italian	6ED1 050-1AA00-0EE8	Width 4 MW	6AG1 057-1AA00-0AA0
Chinese	6ED1 050-1AA00-0KE8	Width 4 MW, with keys	6AG1 057-1AA00-0AA3
LOGO! Memory Card	6ED1 056-1DA00-0BA0	Width 8 MW	6AG1 057-1AA00-0AA1
Program module for copying, with know-how protection		Width 8 MW, with keys	6AG1 057-1AA00-0AA2
LOGO! battery card	6ED1 056-6XA00-0BA0		
Battery module for backing up the integral real-time clock (not LOGO! 24)			
LOGO! memory/battery card	6ED1 056-7DA00-0BA0		
Combined program and battery module, with know-how protection and for backing up the integral real-time clock (not LOGO! 24)			
LOGO! PROM	6AG1 057-1AA01-0BA6		
Programming device used to simultaneously reproduce program module contents on up to 8 program modules			
LOGO!Soft Comfort V7.0	6ED1 058-0BA02-0YA1		
For programming on the PC in LAD/FBD; executes on Windows 7, VISTA, XP, NT4.0, 2000, 98SE, Linux and MAC OSX; on CD-ROM			
LOGO!Soft Comfort V7.0 upgrade	6ED1 058-0CA02-0YE1		
Upgrade from V1.0 to V7.0			

LOGO! modular pure variants

Overview



- The cost-optimized basic variants
- Interface for the connection of expansion modules, up to 24 digital inputs, 16 digital outputs, 8 analog inputs and 2 analog outputs can be addressed
- With connection option for LOGO! TD text display (can be connected to all LOGO! 0BA6 basic variants)

Ordering data	Order No.		Order No.
LOGO! logic module 24Co 24 V DC power supply, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability	6ED1 052-2CC01-0BA6	Accessories LOGO! TD text display 4-line text display, can be connected to all LOGO! 0BA6 Basic and Pure versions, including connecting cable	6ED1 055-4MH00-0BA0
LOGO! logic module 12/24RCo 12/24 V DC power supply, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability	6ED1 052-2MD00-0BA6	SIPLUS LOGO! TD text display (extended temperature range -10 ... +60 °C and medial loading) 4-line text display, can be connected to all LOGO! 0BA6 Basic and Pure versions, including connecting cable	6AG1 055-4MH00-2BA0
LOGO! logic module 24RCo 24 V AC/DC power supply, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability	6ED1 052-2HB00-0BA6	LOGO! Manual German English French Spanish Italian Chinese	6ED1 050-1AA00-0AE8 6ED1 050-1AA00-0BE8 6ED1 050-1AA00-0CE8 6ED1 050-1AA00-0DE8 6ED1 050-1AA00-0EE8 6ED1 050-1AA00-0KE8
LOGO! logic module 230RCo 115/230 V AC/DC power supply, 8 digital inputs 115/230 V AC/DC, 4 relay outputs 10 A, integral time clock; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability	6ED1 052-2FB00-0BA6	LOGO! Memory Card Program module for copying, with know-how protection LOGO! battery card Battery module for backing up the integral real-time clock (not LOGO! 24)	6ED1 056-1DA00-0BA0 6ED1 056-6XA00-0BA0

LOGO! logic module

LOGO! modular

LOGO! modular pure variants

Selection and ordering data (continued)

LOGO! memory/battery card Combined program and battery module, with know-how protection and for backing up the integral real-time clock (not LOGO! 240)	6ED1 056-7DA00-0BA0	LOGO! PC cable For program transfer between LOGO! and the PC	6ED1 057-1AA00-0BA0
LOGO! PROM Programming device used to simultaneously reproduce program module contents on up to 8 program modules	6AG1 057-1AA01-0BA6	LOGO! USB PC cable For transferring the program between LOGO! and PC, including driver on CD-ROM	6ED1 057-1AA01-0BA0
LOGO!Soft Comfort V7.0 For programming on the PC in LAD/FBD; executes on Windows 7, VISTA, XP, NT4.0, 2000, 98SE, Linux and MAC OSX; on CD-ROM	6ED1 058-0BA02-0YA1	LOGO! modem cable Adapter cable for analog modem communication	6ED1 057-1CA00-0BA0
LOGO!Soft Comfort V7.0 upgrade Upgrade from V1.0 to V7.0	6ED1 058-0CA02-0YE1	LOGO! Starter kits (0BA6) LOGO! TD Starter kit Language-neutral with LOGO! 12/24RC0 + LOGO! TD	6ED1 057-3BA10-0AA6

LOGO! modular expansion modules

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Overview



- Expansion modules for connection to LOGO! modular
- With digital inputs and outputs, analog inputs, or analog outputs

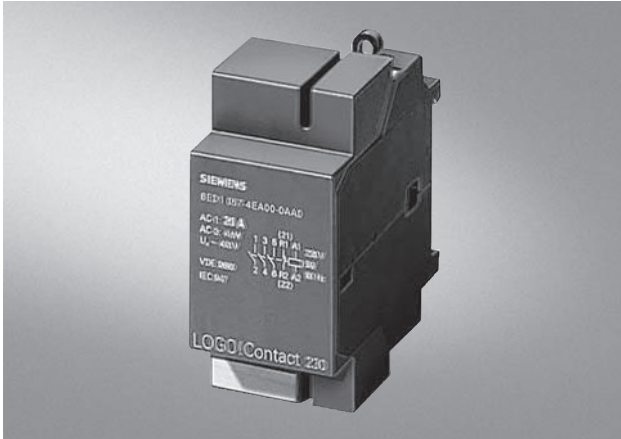
Ordering data	Order No.	Accessories	Order No.
LOGO! DM8 24 Supply voltage 24 V DC, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A	6ED1 055-1CB00-0BA0	LOGO! Manual German English French Spanish Italian Chinese	6ED1 050-1AA00-0AE8 6ED1 050-1AA00-0BE8 6ED1 050-1AA00-0CE8 6ED1 050-1AA00-0DE8 6ED1 050-1AA00-0EE8 6ED1 050-1AA00-0KE8
LOGO! DM16 24 Supply voltage 24 V DC, 8 digital inputs 24 V DC, 8 digital outputs 24 V DC, 0.3 A	6ED1 055-1CB10-0BA0	LOGO! Memory Card for copying, with know-how protection	6ED1 056-1DA00-0BA0
LOGO! DM8 12/24R Supply voltage 12/24 V DC, 4 digital inputs 12/24 V DC, 4 relay outputs 5 A	6ED1 055-1MB00-0BA1	LOGO!Soft Comfort V7.0 For programming on the PC in LAD/FBD; executes on Windows 7, VISTA, XP, NT4.0, 2000, 98SE, Linux and MAC OSX; on CD-ROM	6ED1 058-0BA02-0YA1
LOGO! DM8 24R Supply voltage 24 V AC/DC, 4 digital inputs 24 V AC/DC, 4 relay outputs 5 A	6ED1 055-1HB00-0BA0	LOGO!Soft Comfort V7.0 upgrade Upgrade from V1.0 to V7.0	6ED1 058-0CA02-0YE1
LOGO! DM16 24R Supply voltage 24 V DC, 8 digital inputs 24 V DC, 8 relay outputs 5 A	6ED1 055-1NB10-0BA0	LOGO! PC cable For program transfer between LOGO! and the PC	6ED1 057-1AA00-0BA0
LOGO! DM8 230R Supply voltage 115/230 V AC/DC, 4 digital inputs 115/230 V AC/DC, 4 relay outputs 5 A	6ED1 055-1FB00-0BA1		
LOGO! DM16 230R Supply voltage 115/230 V AC/DC, 8 digital inputs 115/230 V AC/DC, 8 relay outputs 5 A	6ED1 055-1FB10-0BA0		
LOGO! AM2 Supply voltage 12/24 V DC, 2 analog inputs 0 ... 10 V or 0 ... 20 mA, 10-bit resolution	6ED1 055-1MA00-0BA0		
LOGO! AM2 PT 100 Supply voltage 12/24 V DC, 2 analog inputs Pt100, temperature range -50 °C ... 200 °C	6ED1 055-1MD00-0BA1		
LOGO! AM2 AQ Supply voltage 24 V DC, 2 analog outputs 0 to 10 V, 0/4 to 20 mA	6ED1 055-1MM00-0BA1		

LOGO! logic module

LOGO! modular

LOGO! contact & LOGO! TD

Overview



Ordering Data

Order No.

LOGO!Contact

Module for direct switching of resistive consumers up to 20 A and motors up to 4 kW

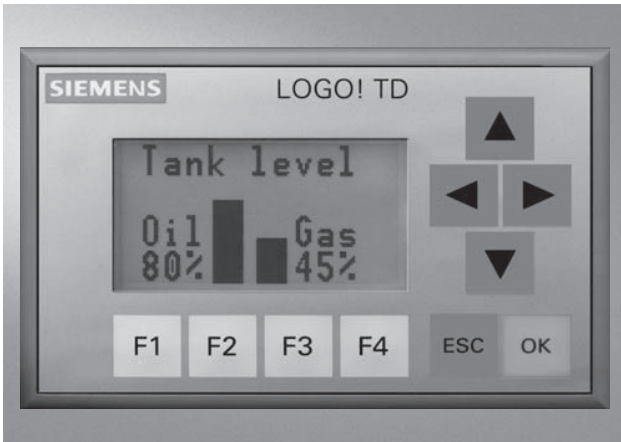
Switching voltage 24 V

Switching voltage 230 V

6ED10574CA000AA0

6ED10574EA000AA0

- Switching module for the direct switching of resistive loads and motors



LOGO! TD Text Display

6ED10554MH000BA0

- 4-line backlit LCD, 128x64 pixel resolution
- 24 VDC/VAC input voltage, includes connecting cable (2.5M) & mounting hardware
- 6 screen navigation keys and 4 user function buttons
- Power-on screen and backlight activate function
- Text, numeric display and timer/counter set point changes
- Advanced bar-graph and text ticker features

Overview



The flat power supply unit for distribution boards

The new miniature power supply units now offer even greater performance in the smallest space: The efficiency has been improved across the entire load range, and the power loss in

no-load operation has been cut in half. The wide-range input now also allows operation with direct voltage, the switch-on behavior has been optimized for capacitive loads, and the operating temperature range has been extended to +70 °C. The power supplies with logic module design can be used extremely flexibly in numerous applications – thanks to their flat, stepped profile in distribution boards, for example.

Essential product features

- 2 performance classes, each with 5 V, 12 V, and 15 V
- 3 performance classes with 24 V
- Flat LOGO! design
- Wide-range input for 85 V to 264 V AC or 110 V to 300 V DC
- Constant current for connection of loads with high inrush current
- Power reserve on starting up through 1.5 times the rated current for capacitive loads
- Adjustable output voltage
- Green LED for "Output voltage OK"
- Temperature range from –20 °C to +70 °C
- Comprehensive certification, e.g. ATEX and GL

Ordering data

LOGO!Power 5 V

Stabilized power supply;
output: 5 V DC/3 A

- Input rated value:
100 ... 240 V AC;
extended operating temperature
range: up to +70 °C

Stabilized power supply;
output: 5 V DC/6.3 A

- Input rated value:
100 ... 240 V AC;
extended operating temperature
range: up to +70 °C

LOGO!Power 12 V

Stabilized power supply;
output: 12 V DC/1.9 A

- Input rated value:
100 ... 240 V AC;
extended operating temperature
range: up to +70 °C

Stabilized power supply;
output: 12 V DC/4.5 A

- Input rated value:
100 ... 240 V AC;
extended operating temperature
range: up to +70 °C

Order No.

6EP1 311-1SH03

6EP1 311-1SH13

6EP1 321-1SH03

6EP1 322-1SH03

LOGO!Power 15 V

Stabilized power supply;
output: 15 V DC/1.9 A

- Input rated value:
100 ... 240 V AC;
extended operating temperature
range: up to +70 °C

Stabilized power supply;
output: 15 V DC/4 A

- Input rated value:
100 ... 240 V AC;
extended operating temperature
range: up to +70 °C

LOGO!Power 24 V

Stabilized power supply;
output: 24 V DC/1.3 A

- Input rated value:
100 ... 240 V AC;
extended operating temperature
range: up to +70 °C

Stabilized power supply;
output: 24 V DC/2.5 A

- Input rated value:
100 ... 240 V AC;
extended operating temperature
range: up to +70 °C

Stabilized power supply;
output: 24 V DC/4 A

- Input rated value:
100 ... 240 V AC;
extended operating temperature
range: up to +70 °C

Order No.

6EP1 351-1SH03

6EP1 352-1SH03

6EP1 331-1SH03

6EP1 332-1SH43

6EP1 332-1SH52

LOGO! logic module

LOGO! Power

LOGO! software

Overview



- The user-friendly software for creating control programs on a PC
- Creation of control programs in Function Block Diagram (FBD) or Ladder Diagram (LAD)
- Plus testing, simulation, online testing and archiving of control programs
- Professional documentation via numerous comment and print functions

Minimum system requirements

Windows 98 SE, NT 4.0, ME, 2000, XP (32 bit), Vista or 7 (32/64 bit)

- PC Pentium.
- 90 MB free disk capacity.
- 64 MB RAM.
- SVGA graphics card with minimum resolution 800x600 (256 colors).

Mac OS X

- Mac OS X 10.4 with J2SE 1.5.0
- Mac OS X 10.5 with J2SE 1.6.0
- PowerMac G3, G4, G4 Cube, iMac, PowerBook G3, G4 or iBook.

Linux

- Tested with SUSE Linux 10 SP2, kernel 2.6.16
- Runs on all Linux distributions on which the Java 2 SDK Version 1.3.1 runs.
- Please refer to your relevant Linux distribution for the necessary hardware requirements.

Ordering data

Order No.

LOGO!Soft Comfort V7.0

6ED1 058-0BA02-0YA1

For programming on the PC in LAD/FBD; executes on Windows 7 (32/64 bit), VISTA, XP, NT4.0, 2000, 98SE, Linux and MAC OSX; on CD-ROM

LOGO!Soft Comfort V7.0 upgrade

6ED1 058-0CA02-0YE1

Upgrade from V1.0 to V7.0

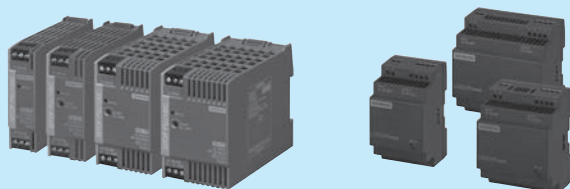
SITOP Power Supplies

Switched Mode Regulated Technology

Introduction

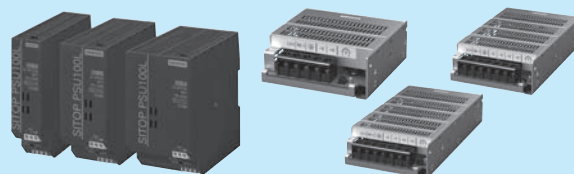
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DC Power supplies for single phase applications 15 watts to 96 watts



- Wide input voltage range on AC and DC networks for wide range of application uses, worldwide
- Output voltages of 5, 12, 15, or 24 VDC
- Wide operating temperature range from -20° to +70° C
- Worldwide agency approvals allow for universal applications

DC Power Supplies for basic, single phase applications 36 watts to 300 watts



- Designed for basic applications that require switched-mode, regulated technology at a competitive price.
- SITOP Lite available in 24 VDC 2.5A, 5A, or 10 A
- SITOP Direct Mount available in 12 VDC and 24 VDC output voltages up to 300 Watts
- SITOP Direct Mount: direct wall mounting, allowing for variable mounting positions

DC Power supplies for standard and demanding single phase applications 60 watts to 960 watts



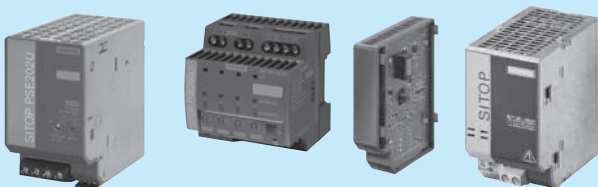
- SITOP Smart available in 12 VDC or 24 VDC output voltages
- SITOP Modular 5A and 10A can be used on single phase and three phase networks
- Built-in relay contact for feedback to upper level control system for most units
- SITOP Smart 24 VDC/10A wall-mount version available for high shock and vibration requirements
- Comprehensive certifications for HazLoc and Marine applications
- Great for use with power security add-on modules

DC Power Supplies for three-phase applications 120 watts to 960 watts



- Robust metal housing and metal DIN rail clip
- SITOP Smart available in 24 VDC 10A, 20A, or 40A
- SITOP Modular available in 24VDC and 48VDC output voltages
- Integrated signaling contact for "24 V OK", high efficiencies, and slim, compact design
- Extra power of 150% for brief operational overloads for most units. SITOP Modular units feature power boost of 300% for 25ms for tripping protective devices.
- Great for use with power security add-on modules

Power Security Add-ons



- The signaling module with signal contacts and remote ON/OFF function optimally integrates SITOP modular devices without integral signaling contact into automated plants.
- For maximum availability, the redundancy module decouples SITOP power supplies of the same type.
- The buffer module bridges short power failures up to 3 seconds with capacitors as energy storage.
- The SITOP select diagnosis and the newer, selectivity module offer selective protection of individual 24 V paths against overload and short-circuits. With this protection and by means of fast fault localization, downtimes can be reduced to a minimum.

DC Uninterruptible Power Supplies



- DC UPS Modules (6A, 15A or 40A) in conjunction with battery modules (ranging from 1.2 Ah to 12 Ah) offer high security and availability of the power network
- DC UPS with capacitor back-up with integrated energy storage 2.5 or 5 kW, combinable with up to three expansion modules for absolutely maintenance free back-up thanks to high-capacity double layer capacitors
- The new DC UPS 1600 modules now offer reliable back-up in conjunction with DC UPS 1100 battery modules in 1.2, 3.2, or 7 Ah with even more possibilities for diagnostics and system integration thanks to an integrated web server and the option of an Ethernet/PROFINET interface

SITOP Power Supplies

Low Wattage, Single Phase Switched-Mode Technology




LOGO! Power:
The flat power supply unit for distribution boards

Overview

These miniature power supply units offer great performance in a small space. They feature high efficiencies across the entire load range and lower power losses in no-load operation. The wide-range input allows operation on both AC and DC networks and the switch-on behavior has been optimized for capacitive loads. The operating temperature range has been extended to -20°C to +70°C allowing these power supplies with logic module design to be used in numerous applications - particularly suited for use in distribution boards thanks to their flat, stepped profile.

- 2 performance classes each for 5 VDC, 12 VDC, and 15 VDC
- 3 performance classes for 24 VDC units
- Flat, stepped profile design
- Wide-range input for 85 - 264 VAC or 110 - 300 VDC
- Constant current for connection of loads with high inrush current
- Power reserve on starting up through 1.5x rated current

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Power (W)	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Short Circuit Protection	Certificates Approvals	Order No.
	5	3	15	85..264 VAC 110..300 VDC	54x90x55	-20°C...+70°C	77%	Constant Current	CE, cULus, GL, ABS, ATEX, NEC Class2, Class I Div 2, FM	6EP1311-1SH03
	12	1.9	23	85..264 VAC 110..300 VDC	54x90x55	-20°C...+70°C	80%	Constant Current	CE, cULus, FM, GL, ABS, ATEX, NEC Class 2, Class I Div 2	6EP1321-1SH03
	15	1.9	29	85..264 VAC 110..300 VDC	54x90x55	-20°C...+70°C	80%	Constant Current	CE, cULus, cCSAus, ATEX, Class I Div 2, GL, ABS	6EP1351-1SH03
	24	1.3	31	85..264 VAC 110..300 VDC	54x90x55	-20°C...+70°C	85%	Constant Current	CE, cULus, FM, GL, ABS, ATEX, NEC Class 2, Class I Div 2	6EP1331-1SH03
	5	6.3	32	85..264 VAC 110..300 VDC	72x90x55	-20°C...+70°C	83%	Constant Current	CE, cULus, GL, ABS, ATEX, Class I Div 2	6EP1311-1SH13
	12	4.5	54	85..264 VAC 110..300 VDC	72x90x55	-20°C...+70°C	85%	Constant Current	CE, cULus, cCSAus, ATEX, Class I Div 2, GL, NEC Class 2	6EP1322-1SH03
	15	4	60	85..264 VAC 110..300 VDC	72x90x55	-20°C...+70°C	85%	Constant Current	CE, cULus, FM, GL, ABS, ATEX, cCSAus Class I Div 2, NEC Class 2	6EP1352-1SH03
	24	2.5	60	85..264 VAC 110..300 VDC	72x90x55	-20°C...+70°C	88%	Constant Current	CE, cULus, FM, GL, ABS, ATEX, cCSAus Class I Div 2	6EP1332-1SH43
	24	4	96	85..264 VAC 110..300 VDC	90x90x55	-20°C...+70°C	89%	Constant Current	CE, cULus, cCSAus, ATEX, Class I Div 2, GL	6EP1332-1SH52

SITOP Power Supplies

Low Wattage, Single Phase Switched-Mode Technology





SITOP Compact:
The slim power supply unit for control boxes

Overview

Thanks to the extremely space-saving slim design, this power supply series for lower performance ranges is especially suited to distributed applications in control boxes or in small control cabinets. These power supplies are characterized by their low power losses throughout the load range. The losses are extremely low even while idling, which makes them great for supply machines and plants which are frequently in stand-by mode. These power supply units have a wide range input for AC and DC networks and plug-in terminals that facilitate the electrical connection.

- Small mounting surface thanks to its slim design
- Wide-range input for 85 - 264 VAC or 110 - 300 VDC
- Low energy consumption during no-load operation or stand-by
- High efficiency across the entire load range
- Up to 28% energy savings in comparison to similar devices
- Plug-in terminals for easy electrical connection

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Power (W)	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Short Circuit Protection	Certificates Approvals	Order No.
	24	0.6	14	85..264 VAC 110..300 VDC	22.5x80x100	-20°C...+70°C	82%	Auto Restart	CE, cULus, cCSAus, ATEX, Class I Div 2 GL, ABS, NEC Class 2	6EP1331-5BA00
	12	2	24	85..264 VAC 110..300 VDC	30x80x100	-20°C...+70°C	82%	Auto Restart	CE, cULus, cCSAus, ATEX, Class I Div 2, GL ABS	6EP1321-5BA00
	24	1.3	31	85..264 VAC 110..300 VDC	30x80x100	-20°C...+70°C	86%	Auto Restart	CE, cULus, cCSAus, ATEX, Class I Div 2, GL, ABS, NEC Class 2	6EP1331-5BA10
	24	2.5	60	85..264 VAC 110..300 VDC	45x80x100	-20°C...+70°C	89%	Auto Restart	CE, cULus, cCSAus, ATEX, Class I Div 2, GL, ABS, NEC Class 2	6EP1332-5BA00
	12	6.5	78	85..264 VAC 110..300 VDC	52.5x80x100	-20°C...+70°C	85%	Auto Restart	CE, cULus, cCSAus, ATEX, Class I Div 2, GL, ABS	6EP1322-5BA10
	24	3.7	89	85..264 VAC 110..300 VDC	52.5x80x100	-20°C...+70°C	87%	Auto Restart	CE, cULus, cCSAus, ATEX, NEC Class 2, GL, ABS, Class I Div 2	6EP1332-5BA20
	24	4	96	85..264 VAC 110..300 VDC	52.5x80x100	-20°C...+70°C	88%	Auto Restart	CE, cULus, cCSAus, ATEX, Class I Div 2, GL, ABS	6EP1332-5BA10

SITOP Power Supplies

Basic, Single Phase Switched-Mode Technology

SITOP Lite: Low-cost basic power supply




Overview

This new range of power supplies is designed for standard requirements in industrial environments and offers all important functions at a favorable price, of course without compromising quality and the proverbial SITOP reliability. The wide range input with manual switchover supports connection to a wide range of 1-phase supply systems.

Thanks to the narrow width, the primary switched-mode units require little space on the DIN rail, and the good efficiency results in low thermal losses in the control cabinet. Short-circuit and overload protection as well as UL approval for export ensure problem-free use.

- 24 VDC/ 2.5A, 5A, 10A for industrial applications with standard requirements
- 1-phase wide-range input with manual switch-over
- Narrow mounting width
- High degree of efficiency
- Parallel connection possible
- Ambient temperature range of 0...+60°C (above +45°C with derating)

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Power (W)	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Short Circuit Protection	Certificates Approvals	Order No.
	24	2.5	60	85..132/ VAC 170...264 VAC (manual switch)	32.5x125x125	0°C...+60°C	85%	Constant Current	CE, cULus	6EP1332-1LB00
	24	5	120	85..132/ VAC 170...264 VAC (manual switch)	50x125x125	0°C...+60°C	86%	Constant Current	CE, cULus	6EP1333-1LB00
	24	10	240	85..132/ VAC 170...264 VAC (manual switch)	70x125x125	0°C...+60°C	90%	Constant Current	CE, cULus	6EP1334-1LB00

SITOP Power Supplies

Basic, Single Phase Switched-Mode Technology

SITOP Direct Mount:
Cost-effective power supply for wall mounting


Overview

This attractively priced regulated power supplies can be screwed directly onto the wall. The rugged aluminum enclosure with IP20 degree of protection can be variably mounted in different positions, even in applications with high temperatures and high shock and vibration requirements.

The wide-range input enables connectivity to the most diverse supply networks worldwide and ensures reliable 12 V DC or 24 V DC supply even if there are large voltage fluctuations. Short circuit and overload protection as well as international certifications ensure problem free and universal use.

- Wall mounting for variable mounting positions
- Aluminum, IP 20 enclosure
- High shock and vibration resistance for harsh environments
- 1 phase wide-range input 85..264 VAC
- UL 508 rated

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Power (W)	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Short Circuit Protection	Certificates Approvals	Order No.
	12	3	36	85..264 VAC	97x98x38	-10°C...+70°C	84%	Auto Restart	CE, cULus, cURus	6EP1321-1LD00
	24	2.1	50	85..264 VAC	97x128x38	-10°C...+70°C	86%	Auto Restart	CE, cULus, cURus	6EP1331-1LD00
	24	3.1	74	85..264 VAC	97x128x38	-10°C...+70°C	86%	Auto Restart	CE, cULus, cURus	6EP1332-1LD00
	24	4.1	98	85..264 VAC	97x158x38	-10°C...+70°C	86%	Auto Restart	CE, cULus, cURus	6EP1332-1LD10
	12	8.3	100	85..264 VAC	97x158x38	-10°C...+70°C	84%	Auto Restart	CE, cULus, cURus	6EP1322-1LD00
	24	6.2	149	85..264 VAC	97x178x38	-10°C...+70°C	86%	Auto Restart	CE, cULus, cURus	6EP1333-1LD00
	24	12.5	300	85..264 VAC	105x199x38	-10°C...+70°C	86%	Auto Restart	CE, cULus, cURus	6EP1334-1LD00

SITOP Power Supplies

Standard, Single Phase Switched-Mode Technology






SITOP Smart:
The powerful standard power supply

Overview

SITOP smart is the optimum power supply for standard applications in 12 VDC or 24 VDC. They offer compact dimensions, a strong performance, and a favorable price. Despite its compactness it offers an outstanding overload with-stand capability. Thanks to the extra power feature with 1.5 times the rated current for 5 seconds, even large loads can be switched on without any problems. With a continuous rated power of 120 percent, the slim power supply units are among the most reliable of their kind. Numerous certifications facilitate the universal and global use and permit their use in hazardous areas.

- Output voltages in 12 VDC or 24 VDC
- All 24 VDC units feature 120% continuous overload at 45°C or less
- All units with extra power of 1.5x rated current for 5s/min
- All 12 VDC and 24 VDC units (except the Wallmount variation) feature automatic input range detection and an integrated relay contact
- SITOP Smart Wallmount 24V/10 A version for applications that require high shock and vibration

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Power (W)	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Short Circuit Protection	Certificates Approvals	Order No.
	24	2.5 3 (to 45°C)	60	85...132/ VAC 170...264 VAC (automatic switch)	32.5x125x125	-10°C...+70°C	85%	Constant Current	CE, cULus, ATEX, GL, Class I Div 2	6EP1332-2BA20
	24	5 6 (to 45°C)	120	85...132/ VAC 170...264 VAC (automatic switch)	50x125x125	-10°C...+70°C	88%	Constant Current	CE, cULus, ATEX, GL, Class I Div 2	6EP1333-2BA20
	12	7	84	85...132/ VAC 170...264 VAC (automatic switch)	50x125x125	-10°C...+70°C	84%	Constant Current	CE, cULus, ATEX, GL, Class I Div 2	6EP1322-2BA00
	24	10 12 (to 45°C)	240	85...132/ VAC 170...264 VAC (automatic switch)	70x125x125	-10°C...+70°C	87%	Constant Current	CE, cULus, ATEX, GL, Class I Div 2	6EP1334-2BA20
	12	14	168	85...132/ VAC 170...264 VAC (automatic switch)	70x125x125	-10°C...+70°C	87%	Constant Current	CE, cULus, ATEX, GL, Class I Div 2	6EP1323-2BA00
	24	10 12 (to 45°C)	240	85...132/ VAC 170...264 VAC (automatic switch)	70x125x125	0°C...+60°C	90%	Constant Current	CE, UL, CSA, ATEX, GL, Class I Div 2	6EP1334-2AA01-0AB0
	24	20 24 (to 45°C)	480	85...132/ VAC 170...264 VAC (automatic switch)	115x145x150	0°C...+70°C	90%	Auto Restart	CE, UL, CSA, ATEX, GL, Class I Div 2	6EP1336-2BA10

SITOP Power Supplies

Standard, Single Phase Switched-Mode Technology






SITOP Modular: The technology power supply for demanding solutions

Overview

SITOP modular fulfills the highest functionality requirements, e.g. for use in complex plants and machines. The wide-range input allows a connection to almost any electrical power system worldwide and ensures a high degree of safety even if there are large voltage fluctuations. The power boost provides up to three times the rated current for brief periods. In the event of an overload, you have two options: Constant current with automatic restart or latching shutdown. The newly innovated PSU100M features a DC input voltages and an integrated signaling contact.

- SITOP Modular 5A and 10A feature extra wide input voltage range for uses on either 1-phase or 3-phase networks in one unit
- SITOP Modular PSU100M 24V/20A features integrated relay contact, DC input voltage range, and high efficiency of 93%
- All units feature power boost of 3x rated current for 25ms
- Load sharing functionality makes this the ideal product for use with power security add-ons (e.g. Redundancy Modules)

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Power (W)	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Short Circuit Protection	Certificates Approvals	Order No.
	24	5	120	85..264 VAC/ 176..550 VAC (manual switch)	70x125x125	-25°C...+70°C	87%	Constant Current or Latching Shutdown	CE, cULus, GL, ABS, ATEX, Class I Div 2, SEMI F47 ¹⁾	6EP1333-3BA00
	24	10	240	85..264 VAC/ 176..550 VAC (manual switch)	90x125x125	-25°C...+70°C	87%	Constant Current or Latching Shutdown	CE, cULus, GL, ABS, ATEX, Class I Div 2, SEMI F47 ¹⁾	6EP1334-3BA00
	24	20	480	85..275 VAC 88..350 VDC	90x125x125	-25°C...+70°C	93%	Constant Current or Latching Shutdown	CE, cULus, GL, ABS, ATEX, Class I Div 2	6EP1336-3BA10
	24	20	480	85..132/ VAC 176...264 VAC (manual switch)	160x125x125	0°C...+70°C	89%	Constant Current or Latching Shutdown	CE, cULus, GL, ABS, ATEX	6EP1336-3BA00
	24	40	960	85..132/ VAC 176...264 VAC (manual switch)	240x125x125	0°C...+70°C	88%	Constant Current or Latching Shutdown	CE, cULus, ATEX	6EP1337-3BA00

¹⁾ At input voltage 208 to 230 VAC

SITOP Power Supplies

Standard, Three Phase Switched-Mode Technology

SITOP Smart:
The powerful standard power supply




Overview

SITOP smart is the optimum power supply for many applications in 24 VDC. They offer compact dimensions, a strong performance, and a favorable price. Despite its compactness it offers an outstanding overload withstand capability.

Thanks to the extra power feature with 1.5 times the rated current for 5 seconds, even large loads can be switched on without any problems. With a continuous rated power of 120 percent, the slim power supply units are among the most reliable of their kind. Numerous certifications facilitate the universal and global use and permit their use in hazardous areas.

- Output voltages in 24 VDC
- All units feature 120% continuous overload at 45°C or less.
- All units feature extra power of 1.5x rated current for 5s/min
- All units with built-in signaling contact for "24 V DC ok"
- Robust metal housing and metal DIN rail clip
- Expandable with power security add-on components

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Power (W)	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Short Circuit Protection	Certificates Approvals	Order No.
Smart Family										
	24	10	240	340...550 V 3 AC	90x145x150	0°C...+70°C	91%	Auto Restart	CE, cULus, ATEX, Class I Div 2, GL	6EP1434-2BA10
	24	20	480	340...550 V 3 AC	90x145x150	0°C...+70°C	91%	Auto Restart	CE, cULus, ATEX, Class I Div 2, GL	6EP1436-2BA10
	24	40	960	340...550 V 3 AC	150x145x150	0°C...+70°C	91.5%	Auto Restart	CE, cULus, ATEX, Class I Div 2, GL	6EP1437-2BA20

SITOP Power Supplies

Standard, Three Phase Switched-Mode Technology

SITOP Modular: The technology power supply for demanding solutions







Overview

SITOP modular fulfills the highest functionality requirements, e.g. for use in complex plants and machines. The wide-range input allows a connection to almost any electrical power system worldwide and ensures a high degree of safety even if there are large voltage fluctuations.

The power boost provides up to three times the rated current for brief periods. In the event of an overload, you have two options: Constant current with automatic restart or latching shutdown. The newly innovated PSU300M features a DC input voltages and an integrated signaling contact.

- SITOP Modular 5A and 10A feature extra wide input voltage range for uses on either 1-phase or 3-phase networks in one unit
- Output voltages in 24 VDC and 48 VDC
- SITOP Modular PSU300M 24V/20A, 24V/40A, 48V/10A features integrated relay contact, extra power of 1.5x rated current, and high efficiency of 93%
- All units feature power boost of 3x rated current for 25ms
- Robust metal housing and metal DIN Rail clip
- Load sharing functionality makes this the ideal product for use with power security add-ons (e.g. Redundancy Modules)

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Power (W)	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Short Circuit Protection	Certificates Approvals	Order No.
Modular Family										
	24	5	120	85..264 VAC/ 176..550 VAC (manual switch)	70x125x125	-25°C...+70°C	87%	Contant Current or latching shutdown	CE, cULus, GL, ABS, ATEX, Class I Div 2, SEMI F471)	6EP1333-3BA00
	24	10	240	85..264 VAC/ 176..550 VAC (manual switch)	90x125x125	-25°C...+70°C	87%	Contant Current or latching shutdown	CE, cULus, GL, ABS, ATEX, Class I Div 2, SEMI F471)	6EP1334-3BA00
	24	20	480	320...575 V 3 AC	70x125x125	-25°C...+70°C	93%	Contant Current or latching shutdown	CE, cULus, GL, ABS, SEMI F47, ATEX, Class I Div 2	6EP1436-3BA10
	48	10	480	320...575 V 3 AC	70x125x125	-10°C...+70°C	93%	Constant Current or Latching Shutdown	CE, cULus, GL, ABS, ATEX, Class I Div 2	6EP1456-3BA00
	24	20	480	340...550 V 3 AC	160x125x125	0°C...+70°C	90%	Auto Restart	CE, UL, CSA, GL, ABS, SEMI F47	6EP1436-3BA00
	24	40	960	320...550 V 3 AC	150x125x150	-25°C...+70°C	93%	Auto Restart	CE, UL, CSA, GL, ABS, SEMI F47, ATEX, Class I Div 2	6EP1437-3BA10
	24	40	960	340...550 V 3 AC	240x125x125	0°C...+70°C	90%	Auto Restart	CE, UL, CSA, SEMI F47	6EP1437-3BA00
	48	20	960	340...550 V 3 AC	240x125x125	0°C...+60°C	90%	Auto Restart	CE, UL, CSA, GL, ABS	6EP1457-3BA00

¹⁾ At input voltage 208 to 230 VAC

SITOP Power Supplies

Three Phase Power Supplies in Special Design

• Revised •
08/01/14

SITOP in Special Design:
Well prepared for special tasks and conditions

Overview




SITOP PSU300E: three-phase power supply with low output and removable plug-in terminals.

- Sturdy metal enclosure is only 42 mm wide and does not require mounting distances on the sides to other devices
- Low heat generation due to the high efficiency level of 90%
- The wide input range of 320 V to 550 V 3AC allows for mains buffering times of 50 ms, thus enabling use in unstable three-phase systems
- Removable plug-in terminals simplify the connection to AC and DC
- An LED and an integrated "DC 24 V OK" signaling contact indicate the status of the output voltage
- Output voltage can be adjusted from 24 V to 29 V

SITOP PSU300B: three-phase power supply optimized for battery charging

- Available in output in 12 VDC and 24 VDC output voltages
- High efficiencies up to 93%
- Slim, compact design without the need for lateral mounting clearance
- Constant current characteristic makes them optimal for battery charging
- Wide range input for voltages 3AC 320 to 575 V allow for use in traditional three-phase applications

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Power (W)	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Short Circuit Protection	Certificates Approvals	Order No.
PSU300E Family										
	24	5	120	320...575 V 3 AC	42x125x125	0°C...+60°C	90%	Auto Restart	CE, cULus, ATEX, cCSAus Class I Div 2, GL	6EP1433-0AA00
PSU300B Family										
	12	20	240	320...575 V 3 AC	70x125x125	-25°C...+60°C	86%	Constant Current or latching shutdown	CE, cULus	6EP1424-3BA00
	24	17	408	320...575 V 3 AC	70x125x125	-25°C...+70°C	93%	Constant Current or latching shutdown	CE (cULus pending)	6EP1436-3BA20
	24	30	720	320...575 V 3 AC	150x125x125	-25°C...+70°C	93%	Constant Current or latching shutdown	CE, cULus	6EP1437-3BA20

SITOP Power Supplies

Single Phase Power Supplies in Special Design

SITOP in Special Design:
Well prepared for special tasks and conditions

Overview










SIMATIC Design:

- The original SIMATIC power supplies merge perfectly into the PLC network in terms of their design and functionality.
- **SIMATIC S7-200:** this flat power supply unit is also used for low installation depths
- **SIMATIC S7-1200:** the compact PM1207 power module supplies power to the S7-1200 micro PLC.
- **SIMATIC S7-300:** these innovative power supplies feature automatic switchover on 120/230 VAC networks and a slimmer design than older versions of the PS307
- **SIMATIC S7-1500:** the compact PM1507 power modules supply power to the newly released, SIMATIC S7-1500 PLC

Other Types:

- **DC/DC Converter:** features a narrow DIN rail housing and needs a 24 V DC input voltage - it can also be used in conjunction with a DC UPS to provide an uninterruptible 12 VDC.
- **Dual:** the electronics power supply for the control cabinet; the industry-standard rail mounted device has two 15 VDC outputs for loads that may require ± 15 V DC
- **Flexi:** limitless diversity thanks to variable output. Allows flexible adjustment between 3 and 52 VDC so just one standard power supply can be used for different voltages
- **PSU400M:** compact DC/DC converter with wide DC input voltage range from 200 to 900 VDC. Ideally suited for use with frequency-controlled drive systems

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Power (W)	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Certificates Approvals	Order No.
SIMATIC Design									
SIMATIC S7-200 	24	3.5	84	85..132 V AC/ 176..264 VAC (auto switch)	160x80x62	0°C...+60°C	84%	CE, cULus	6EP1332-1SH31
SIMATIC S7-1200 	24	2.5	60	85..132 V AC/ 176..264 VAC (auto switch)	70x100x75	0°C...+60°C	83%	CE, cULus, ATEX, cCSAus Class I Div 2, GL, ABS	6EP1332-1SH71
SIMATIC S7-300 	24	2	48	85..132 V AC/ 170..264 VAC (auto switch)	40x125x120	0°C...+60°C	84%	CE, cULus, ATEX, cULus Class I Div 2, GL, ABS	6ES7307-1BA01-0AA0
	24	5	120	85..132 V AC/ 170..264 VAC (auto switch)	60x125x120	0°C...+60°C	86%	CE, cULus, ATEX, cULus Class I Div 2, GL, ABS	6ES7307-1EA01-0AA0
	24	10	240	85..132 V AC/ 170..264 VAC (auto switch)	80x125x120	0°C...+60°C	90%	CE, cULus, ATEX, cULus Class I Div 2, GL, ABS	6ES7307-1KA02-0AA0
SIMATIC S7-1500 	24	3	72	85..132 V AC/ 176..264 VAC (auto switch)	50x141x135	0°C...+60°C	87%	CE, cULus, FM, ATEX, pending: cULus Class I Div 2, GL, ABS	6EP1332-4BA00
SIMATIC S7-1500 	24	8	192	85..132 V AC/ 176..264 VAC (auto switch)	75x147x135	0°C...+60°C	91%	CE, cULus, FM, ATEX, pending: cULus Class I Div 2, GL, ABS	6EP1333-4BA00
Other Types									
DC/DC 	12	2.5	30	24 VDC (18.5...30.2 V DC)	32.5x125x125	0°C...+60°C	80%	CE, cULus	6EP1621-2BA00
Dual 	2x15	3.5	105	93..264 V AC	75x125x125	0°C...+60°C	80%	CE	6EP1353-0AA00
Flexi 	3..52	10	max 120W	85..132 V AC/ 170...264 V AC	75x125x125	0°C...+60°C	84%	CE, cULus	6EP1353-2BA00
PSU400M 	24	20	480	200...900 V DC (start-up from 400 V DC)	90x125x125	-25°C... +70°C	95%	CE, cULus, GL (ABS pending)	6EP1536-3AA00

SITOP Power Supplies

Power Security Add-On Modules

SITOP Expansion Modules

Overview

A power supply unit on its own cannot guarantee a fault-free 24 V DC supply. Power failures, extreme variations in the mains voltage, or a faulty load can bring plant operation to a standstill and cause high costs. The expansion modules offer everything from extensive protection against interference on the primary and secondary side right up to complete all-round protection.







■ **Signaling Module:** Module for snapping onto the side of the basic unit SITOP modular (6EP1x3x-3BA00, 6EP1457-3BA00); automatic contacting, with floating signaling contacts for "Output voltage o.k." and "Operating readiness o.k."; with signal input for switching the basic unit ON/OFF remotely.

■ **Buffer Module:** Module for mains buffering; parallel connection at output of 24 V basic units (6EP1x3x-3BAxx); buffering time 200 ms at 40 A to 1.6 s at 5 A load current; multiplication possible through parallel connection; maximum buffer time 10 s.

■ **Redundancy Module:** Module for redundancy mode. Floating relay contact and green LED for signaling "Infeed 1 and 2 o.k.", switching threshold adjustable between 20 to 25 V DC.

■ **Selectivity/Select Diagnosis Module:** Module for distributing the 24 V DC supply over up to four load circuits and their monitoring for overload; selective shutdown of faulty

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Power (W)	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Certificates Approvals	Notes	Order No.
SITOP Expansion Modules										
Signaling 	N/A	N/A	84	Contact Rating: 240 V AC/ 6 A	25x125x125	0...+60°C	N/A	CE, UL, CSA		6EP1961-3BA10
Buffer 	24	40	60	24 V DC (24...28.8 VDC)	70x125x125	0...+60°C	N/A	CE, UL, CSA, GL, ABS, ATEX, Class I Div 2		6EP1961-3BA01
Redundancy 	24	10*	48	24 V DC (19...29 VDC)	30x80x100	-20°...+60°C	97%	CE, cULus	Decouple of 2.5 A or one 10A power supply per redundancy module	6EP1964-2BA00
	24	3.5*	120	24 V DC (19...29 VDC)	30x80x100	-20°...+60°C	95%	CE, cULus, NEC Class 2	Decoupling and limitation of the output to Class 2 limit (100 W) of 2 power supplies 5 to 40.	6EP1962-2BA00
Redundancy 	24	40*	240	24 V DC (24...28.8 VDC)	70x125x125	0...+60°C	97%	CE, cULus, cCSAus Class I Div 2, ATEX, GL, ABS	Decouple of 2.5 to 20 A or one 40A power supply per redundancy module	6EP1961-3BA21
Selectivity 	24	4 x 3A (0.5A...3A)	72	24 V DC (22...30 VDC)	72x80x72	0...+60°C	97%	CE, UL, cURus, cCSAus Class I Div 2, ATEX, GL (ABS pending)	Individual load circuits can be switched on sequentially. Status indication via 3-color LED per channel; remote reset with 24 V signal and reset via pushbutton per channel; common signaling contact	6EP1961-2BA11 6EP1961-2BA31**
	24	4 x 10 A (3A...10 A)	192	24 V DC (22...30 VDC)	72x80x72	0...+60°C	97%	CE, UL, cURus, cCSAus Class I Div 2, ATEX, GL (ABS pending)	Status indication via 2-color LED per channel; common reset via pushbutton, plug-in fuse per channel; status indication via 3-color LED per channel; common signaling contact	6EP1961-2BA21 6EP1961-2BA41**
Select Diagnosis 	12	4 x 10 A (2A...10 A)	30	24 V DC (22...30 VDC)	72x90x90	0...+60°C	97%	CE, UL, cURus, cCSAus Class I Div 2, ATEX	Status indication via 2-color LED per channel; common reset via pushbutton, plug-in fuse per channel; status indication via 3-color LED per channel; common signaling contact	6EP1961-2BA00

*Total Current

**With single channel signaling for individual channel specific analyses








Overview

Reliable 24 VDC at all times, even when power fails

Compact DC UPS modules ensure continued operation, even over a period of hours, depending on battery capacity and power requirements. The sophisticated battery management ensures optimal charging of the batteries – and means that the unit is always reliably available for buffering. The active battery test function even checks the age of the battery. This means that precautionary replacement of the battery isn't necessary – a substantial cost saving for your plant. All relevant messages are output via floating contacts, or optionally via a serial interface or USB port.

- DC UPS Modules 6A, 15A, and 40 A
- Maintenance-free battery modules up to 12 Ah
- Monitoring of operational readiness, battery feeder, aging, and charging status
- Extended life of loads and batteries due to built-in intelligent battery management
- Uninterrupted transition into buffer mode

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Storage	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Short-Circuit Protection	Certificates Approvals	Order No.
	24	6	Depends on battery	24 V DC (22...29 V DC)	50x125x125	-25°...+60°C	94%	Auto Restart	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP1931-2DC21 6EP1931-2DC31* 6EP1931-2DC42**
	24	15	Depends on battery	24 V DC (22...29 V DC)	50x125x125	-25°...+60°C	96%	Auto Restart	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP1931-2EC21 6EP1931-2EC31* 6EP1931-2EC42**
	24	40	Depends on battery	24 V DC (22...29 V DC)	102x125x125	-25°...+60°C	97%	Auto Restart	CE, cULus, ATEX; cCSAus Class I Div 2, GL, ABS	6EP1931-2FC21 6EP1931-2FC42**
	24	6	1.2 Ah	EOC (> +20°C) 26.4...27.3 VDC EOC (<+20°C) 27.3...29.0 VDC	96x106x108	-10°...+50°C	N/A	Installed Fuse 7.5 A/ 32 V	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP1935-6MC01
	24	15	3.2 Ah	EOC (> +20°C) 26.4...27.3 VDC EOC (<+20°C) 27.3...29.0 VDC	190x151x82	-10°...+50°C	N/A	Installed Fuse 15 A/ 32 V	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP1935-6MD11
	24	30	7 Ah	EOC (> +20°C) 26.4...27.3 VDC EOC (<+20°C) 27.3...29.0 VDC	186x168x121	-10°...+50°C	N/A	Installed Fuse 30 A/ 32 V	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP1935-6EM21
	24	30	12 Ah	EOC (> +20°C) 26.4...27.3 VDC EOC (<+20°C) 27.3...29.0 VDC	253x168x121	-10°...+50°C	N/A	Installed Fuse 30 A/ 32 V	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP1935-6MF01
	24	15	2.5 Ah	EOC (> +20°C) 26.4...27.3 VDC EOC (<+20°C) 27.3...29.0 VDC	265x151x91	-40°...+60°C	N/A	Installed Fuse 15 A/ 32 V	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP1935-6MD31

EOC = End of Charge

*With Serial Interface

**With USB Interface

SITOP Power Supplies

DC Uninterruptible Power Supplies

DC UPS with Battery and Capacitor Back-up

Overview

UPS 1600/1100 System with Ethernet/PROFINET Interface

New UPS1600 now offers all of the same functionality as older DC UPS system with even more possibilities for diagnostics and system integration. The UPS 1600 offers comprehensive functions, open communication via USB or Ethernet/PROFINET, and remote monitoring with integrated web server functionality. With conjunction with the UPS1100 battery modules, the system automatically detects the type of battery and charges it at the optimal, temperature-controlled charging characteristics.







- DC UPS 1600 Modules in 24VDC/ 10 A or 20 A
- DC UPS 1100 Modules up to 7 Ah
- Increased diagnostics with Ethernet/PROFINET interface and integrated webserver

24 V DC UPS with maintenance-free capacitor back-up

These highly-capacitive double-layer capacitors store sufficient energy to shut down PC-based systems safely. The capacitors have an extremely long life even at high ambient temperatures. No maintenance or replacement of the energy buffer is required, which means that the DC UPS pays for itself within a short time. And because the capacitors do not emit any gas, no ventilation of the control cabinet is required. The buffering time can be extended by adding expansion modules.

- SITOP UPS500S 15A up to 20 kWS with expansion modules
- Capacitors eliminate replacement of batteries
- Long life even at high ambient temperatures

Selection and ordering data

	Output Voltage (V DC)	Output Current (A)	Storage	Rated Input Voltage	Dimensions (WxHxD) mm	Ambient Temperature	Efficiency	Short-Circuit Protection	Certificates Approvals	Order No.
	24	10	Depends on battery	24 VDC (21...29 VDC)	50x125x125	-25°...+70°C	97.3%	Auto Restart	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP4134-3AB00-0AY0 6EP4134-3AB00-1AY0** 6EP4134-3AB00-2AY0***
	24	20	Depends on battery	24 VDC (21...29 VDC)	50x125x125	-25°...+70°C	97.5%	Auto Restart	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP4136-3AB00-0AY0 6EP4136-3AB00-1AY0** 6EP4136-3AB00-2AY0***
	24	10	1.2 Ah	EOC (> +20°C) 26.4...27.3 VDC EOC (<+20°C) 27.3...29.0 VDC	89x130x107	-10°...+50°C	N/A	Installed Fuse 15 A/32 V	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP4131-0GB00-0AY0
	24	20	3.2 Ah	EOC (> +20°C) 26.4...27.3 VDC EOC (<+20°C) 27.3...29.0 VDC	190x169x79.5	-10°...+50°C	N/A	Installed Fuse 25 A/32 V	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP4133-0GB00-0AY0
	24	40	7 Ah	EOC (> +20°C) 26.4...27.3 VDC EOC (<+20°C) 27.3...29.0 VDC	186x186x110.5	-10°...+50°C	N/A	Installed Fuse 2 x 25A A/32 V	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP4134-0GB00-0AY0
	24	15	2.5 kW	24 VDC (22...29 VDC) infeed from 24 VDC SITOP	120x125x125	0...+60°C	97.5%	Auto Restart	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP1933-2EC41
	24	15	5 kW	24 VDC (22...29 VDC) infeed from 24 VDC SITOP	120x125x125	0...+60°C	97.5%	Auto Restart	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP1933-2EC51
	N/A	N/A	5 kW	Infeed from 2.5 kW or 5 kW basic unit	70x125x125	0...+60°C	N/A	Auto Restart	CE, cULus, ATEX; Class I Div 2, GL, ABS	6EP1935-5PG01

EOC = End of Charge

¹⁾ To be released Q1 2014

**With USB Interface

***With Ethernet/PROFINET Interface

Overview



	6EP1935-6MC01	6EP1935-6MD11	6EP1935-6EM21	6EP1935-6MF01	6EP1935-6MD31	6EP4131-0GB00-0AY0	6EP4133-0GB00-0AY0	6EP4134-0GB00-0AY0
	1.2 Ah	3.2 Ah	7 Ah	12 Ah	2.5 Ah	1.2 Ah	3.2 Ah	7 Ah
1A	34.5 min	2.6 h	5.4 h	9 h	2 h	24.5 min	2.6 h	5.4 h
2A	15.5 min	1 h	2.6 h	4.6 h	1 h	15.5 min	1 h	2.6 h
3A	9 min	39.3 min	1.6 h	2.9 h	37.5 min	9 min	39.3 min	1.6 h
4A	6.5 min	27.1 min	1.2 h	2.2 h	27 min	6.5 min	27.1 min	1.2 h
6A	3.5 min	17.5 min	41 min	1.2 h	17.6 min	3.5 min	17.5 min	41 min
8A	—	12.1 min	28.6 min	53.3 min	12.5 min	2 min	12.1 min	28.6 min
10A	—	9 min	21.8 min	43.5 min	8.8 min	1 min	9 min	21.8 min
12A	—	—	17.3 min	33.3 min	6.8 min	—	7 min	17.3 min
14A	—	—	15.1 min	27.5 min	5.1 min	—	5 min	15.1 min
16A	—	—	12.5 min	23.8 min	4.3 min	—	4 min	12.5 min
20A	—	—	9.1 min	20.1 min	—	—	1 min	9.1 min
25A	—	—	—	12.6 min	—	—	—	—
30A	—	—	—	9.1 min	—	—	—	—



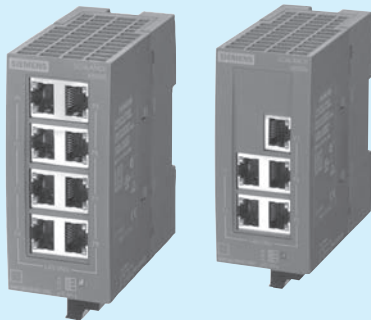
		6EP1933-2EC41	6EP1933-2EC51	6EP1935-5PG01				
Basic Units		2.5 kW	5 kW	2.5 kW	5 kW	2.5 kW	5 kW	5 kW
Expansion modules		—	—	1 x 5 kW	1 x 5 kW	2 x 5 kW	2 x 5 kW	3 x 5 kW
Combined Energy Storage		2.5 kW	5 kW	7.5 kW	10 kW	12.5 kW	15 kW	20 kW
at load current	0.5	134 s	236 s	390 s	478 s	632 s	748 s	851 s
	0.8	90 s	167 s	266 s	346 s	440 s	527 s	580 s
	1A	75 s	138 s	219 s	296 s	365 s	414 s	490 s
	2A	38 s	76 s	122 s	156 s	203 s	230 s	265 s
	3A	26 s	52 s	82 s	106 s	136 s	159 s	186 s
	4 A	19 s	39 s	61 s	81 s	101 s	120 s	139 s
	5 A	15 s	31 s	49 s	65 s	81 s	95 s	111 s
	6 A	12 s	26 s	40 s	55 s	67 s	80 s	94 s
	7 A	10 s	21 s	34 s	47 s	58 s	69 s	81 s
	8 A	8 s	18 s	29 s	40 s	50 s	59 s	69 s
	10	6 s	15 s	23 s	32 s	39 s	47 s	54 s
	12	4 s	12 s	19 s	26 s	32 s	38 s	44 s
	15	3 s	9 s	14 s	20 s	25 s	30 s	35 s
Charging Times at load current	2 A	54 s	120 s	158 s	223 s	263 s	318 s	355 s
	1 A	110 s	205 s	311 s	425 s	503 s	625 s	695 s

Please use the SITOP Selection Tool for more detailed back-up time information
www.siemens.com/sitop-selection-tool

SIMATIC Net

Ethernet Infrastructure Components

Scalance Unmanaged Switches



Ordering Data

Order No.

XB005 (5 RJ45 ports)

6GK5005-0GA00-1AB2

XB008 (8 RJ45 ports)

6GK5008-0BA00-1AB2

Scalance Unmanaged Industrial Ethernet Switches

The SCALANCE unmanaged Industrial Ethernet switch with up to eight RJ45 10/100 Mbit/s ports. These products provide a cost-optimized solution for the design of small star or line structures with switching functionality in isolated machines or plant sections. These SCALANCE switches are designed for space saving installation on standard DIN rail and include a removable terminal block for the 24 VDC power connection.

Scalance Managed Switches



Ordering Data

Order No.

XB208 (8 RJ45 ports)

6GK5208-0BA00-2AA3

Scalance Managed Industrial Ethernet Switches

The SCALANCE managed Industrial Ethernet switch is offered with on-site diagnostics via LEDs. The unit can be included in network management systems via SNMP. SCALANCE X-208 switch has an integrated redundant ring manager. The SCALANCE X-208 product has a redundant voltage supply (2 x 24 V DC) and a fault-signaling contact on the front of the housing. For diagnostics purposes the unit can also be accessed via a Web Browser.

Ordering Data

Order No.

IE FC RJ45 Plug	90 deg - 1 unit
IE FC RJ45 Plug	90 deg - 10 units
IE FC RJ45 Plug	90 deg - 50 units
IE FC RJ45 Plug	180 deg - 1 unit
IE FC RJ45 Plug	180 deg - 10 unit
IE FC RJ45 Plug	180 deg - 50 unit

6GK19011BB202AA0
6GK19011BB202AB0
6GK19011BB202AE0
6GK19011BB102AA0
6GK19011BB102AB0
6GK19011BB102AE0

Industrial Ethernet FastConnect RJ45 Plugs

The compact and rugged design of the plug-in connectors allow the FC RJ45 Plugs to be used in the industrial environment.

IE FC Stripping Tool

6GK19011GA00

IE FC Blade Cassettes (5pack)

6GK19011GB01

Industrial Ethernet FastConnect Stripping Tool

Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables.

IE TP RJ45/RJ45 CAT 5e Cable - 0.5 m
IE TP RJ45/RJ45 CAT 5e Cable - 1 m
IE TP RJ45/RJ45 CAT 5e Cable - 2 m
IE TP RJ45/RJ45 CAT 5e Cable - 6 m
IE TP RJ45/RJ45 CAT 5e Cable - 10 m

6XV18502GE50
6XV18502GH10
6XV18502GH20
6XV18502GH60
6XV18502GN10

Industrial Ethernet Twisted Pair Cables

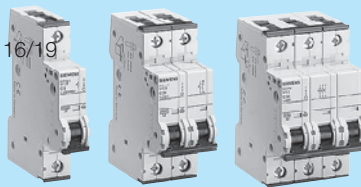
Premolded Cat5e (2x2) patch cables in pre-assembled lengths from 0.5 - 10m.

Contents

5SJ4 Branch Circuit Protectors

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Selection and ordering data	
• 1-pole up to 63A	16/4
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5SY4 Supplementary Protectors

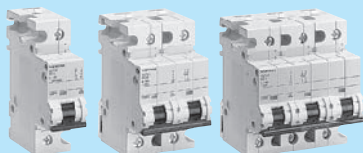
5SY4	Page
Selection and ordering data	
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5SY6 Supplementary Protectors

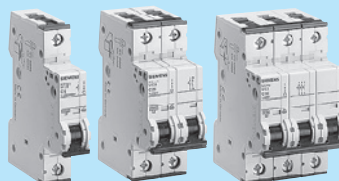
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5SP Supplementary Protectors

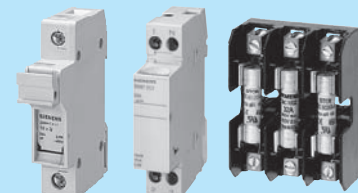
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• 1-, 2- & 3-pole up to 30 A	16/30

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Control Circuit Protection

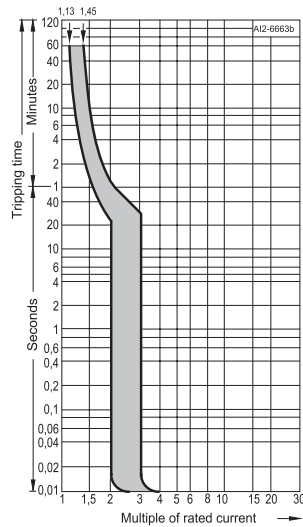
General Data

Trip characteristics

Tripping characteristics acc. to EN 60 898

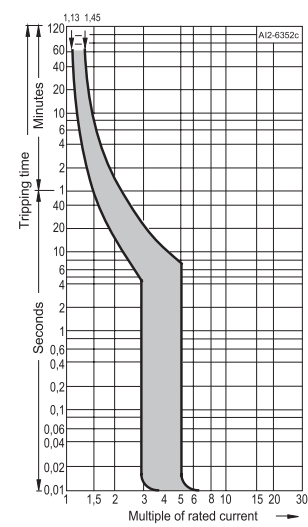
Tripping characteristic A, -5

Type A characteristic is designed to protect very sensitive circuits such as semiconductors. Magnetic trip point - 2 to 3 times I_n rating. Thermal trip point - 1.13 to 1.45 protector rating.



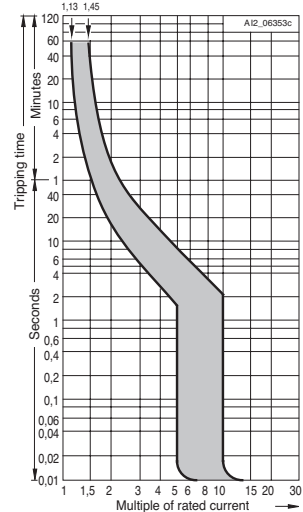
Tripping characteristic B, -6

Type B characteristic designed for European residential circuit protection. This characteristic can also be used for protection of computers and electronic equipment. Magnetic trip point - 3 to 5 times I_n rating. Thermal trip point - 1.13 to 1.45 protector rating.



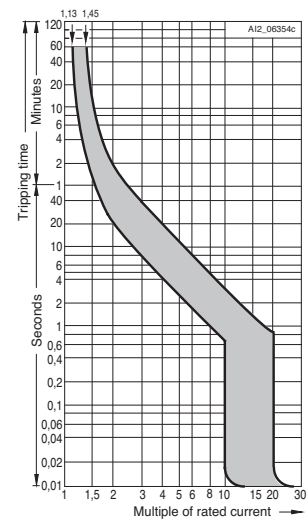
Tripping characteristic C, -7

Type C characteristic is for general device protection in control circuits. Magnetic trip point - 5 to 10 times I_n rating. Thermal trip point - 1.13 to 1.45 protector rating.



Tripping characteristic D, -8

Type D characteristic is designed for high inrush loads. Magnetic trip point - 10 to 20 times I_n rating. Thermal trip point - 1.13 to 1.45 protector rating.






For different ambient temperatures, the current values of the delayed tripping operation change by approximately 5% per 10°K temperature difference. Specifically they increase for temperatures below 25°C (5SJ41), 30°C (5SP, 5SY) and decrease for temperatures above 25°C (5SJ41), 30°C (5SP, 5SY).

For DC voltages the maximum current values of the instantaneous tripping operation increase by a factor of 1.2.

If more than one electrical circuit is loaded in a series of miniature circuit breakers or supplementary protectors, the resulting increase in ambient temperature affects the characteristic curve. In this case an additional correction factor found in the following table must be used.

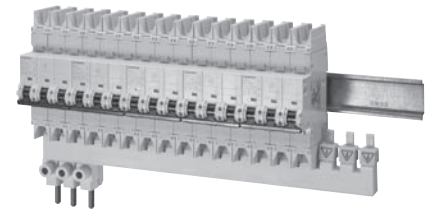
Number	1	2 - 3	4 - 6	> 7
Correction factor K	1.00	0.90	0.88	0.85

Selection and ordering data

5SJ4 Miniature Circuit Breaker Guide			
Catalog Series	5SJ41...-HG40	5SJ4...-HG41	5SJ4...-HG42
Rated Voltage	240, 120 VAC 60 VDC Same Polarity	240 VAC 60/125 VDC	480Y/277 VAC 60/125 VDC
Number of Poles	1-Pole	1-, 2- and 3-Poles	
Trip Characteristics	B, C, D	C, D	
Rated Current	B Characteristic: 6 to 63 A C and D Characteristic: 0.3 to 63 A		C Characteristic: 0.3 to 40 A D Characteristic: 0.3 to 32 A
Interrupting Ratings ¹⁾	B Characteristic: 14 kA (6 to 63 A)	—	—
	C Characteristic: 14 kA (0.3 to 40 A) 10 kA (45 to 63 A)		C Characteristic: 10 kA (0.3 to 40 A) ²⁾
	D Characteristic: 14 kA (0.3 to 20 A) 10 kA (25 to 63 A)		D Characteristic: 10 kA (0.3 to 32 A) ²⁾

1) 14 kA = Type HSJ; 10 kA = Type NSJ.

2) At 240 VAC the Interrupting Rating is the same as the 5SJ4...-HG40 and .HG41.



5SJ4...-HG41 Miniature Circuit Breakers

Certifications:

CE

UL Listed and Certified to Canadian
Standards

HACR Rated

Features

Features – UL 489

- Suitable for Branch Circuit Protection Applications up to 277 VAC and 60 VDC (1-pole); and, up to 480Y VAC and 125 VDC (2- and 3-pole)
- UL Listed and Certified to Canadian Standards, File E243414
- HACR Rated
- High AC Interrupting Ratings of up to 14,000 (Type HSJ) or 10,000 (Type NSJ) Maximum RMS Symmetrical Amps and, DC interrupting ratings of 10,000 Amps
- 40°C Calibration Base (Industrial Applications)
- Can be used for "field wiring" applications; AWG 14 to AWG 4, Copper (Cu) Only
- Suitable for "reverse feed" applications

Features – EN/IEC 60 898

- 30°C Calibration Base
- Trip Characteristic B, C and D
B: Designed for the protection of computers and electronic equipment. Magnetic trip point is 3 to 5 times the MCB rating.
C: Designed for general device protection in control circuits and all other miniature circuit breaker systems. Magnetic trip point is 5 to 10 times the MCB rating.
D: Designed for high inrush loads. Magnetic trip point is 10 to 20 times the MCB rating.
- Rated voltage of 24 VAC minimum, 440 VAC Maximum and 60 VDC per pole
- High Interrupting Rating (I_{cn}) of up to 10,000 Amps
- 0.75 to 35 mm² solid and stranded conductors

Features – Common

- Depending on the device selected
 - Available with 1-, 2- or 3-poles
 - Available from 0.3 to 63 amps
- Visible Indicator for ON and OFF/Trip
- Touch Protection to EN50274
- DIN Rail Mounting (Standard 35 mm)
- Identical Wire Screw Connections on Line and Load Sides
- Smaller Size than traditional MCCB's

Auxiliary Circuit Switches (AS) are available with One Normally Open + One Normally Closed, Two Normally Open or Two Normally Closed contacts. They are primarily used to signal the miniature circuit breaker's trip mechanism position.

Fault Signal Contacts (FC) are available with One Normally Open + One Normally Closed, Two Normally Open or Two Normally Closed contacts. They are primarily used to signal the automatic tripping of the miniature circuit breaker's trip mechanism; and, trip position.

Shunt Trip Switches (ST) are available in voltages of 110 to 480 VAC and 24 to 60 V AC/DC. They are used for remote tripping of a miniature circuit breaker.

5ST366...-HG busbars, touch protection covers and terminal connectors are intended for use with Siemens lines of 5SJ4...-HG4. UL 489 Miniature Circuit Breakers. They are UL Recognized (File E32159) with a rating of 115 Amps maximum at 480Y/277 VAC. Busbars are available in 1-, 2- or 3-pole versions.

Touch Protection Covers are used to cover any unused busbar terminals. They are intended to protect a user from live electrical parts.

Terminal Connectors are used to connect electrical conductors up to 1 AWG (50mm²) to the busbar terminals. Two versions are available; connect directly to the miniature circuit breaker or direct connection to the busbar.

Control Circuit Protection


5SJ Branch Circuit Protection

5SJ4 70 mm mounting depth

Features

5SJ41...HG40 miniature circuit breakers are designed to comply with UL 489 and CSA 22.2 No. 5-02 standards. They are used in single pole, branch circuit protection applications up to 240 VAC maximum and 60 VDC maximum, same polarity. Refer to Technical Data (page 16/8) for additional information.

Selection and ordering data

	I_n	Characteristic B			Characteristic C			Characteristic D			Weight 1 Item
		Order No.	Inter- ruption Type ¹⁾	List Price \$ 1 item	Order No.	Inter- ruption Type ¹⁾	List Price \$ 1 item	Order No.	Inter- ruption Type ¹⁾	List Price \$ 1 item	
	1-pole										
	0.3	—	—		5SJ4114-7HG40	HSJ		5SJ4114-8HG40	HSJ		0.155
	0.5	—	—		5SJ4105-7HG40	HSJ		5SJ4105-8HG40	HSJ		
	1	—	—		5SJ4101-7HG40	HSJ		5SJ4101-8HG40	HSJ		
	1.6	—	—		5SJ4115-7HG40	HSJ		5SJ4115-8HG40	HSJ		
	2	—	—		5SJ4102-7HG40	HSJ		5SJ4102-8HG40	HSJ		
	3	—	—		5SJ4103-7HG40	HSJ		5SJ4103-8HG40	HSJ		
	4	—	—		5SJ4104-7HG40	HSJ		5SJ4104-8HG40	HSJ		
	5	—	—		5SJ4111-7HG40	HSJ		5SJ4111-8HG40	HSJ		
	6	5SJ4106-6HG40	HSJ		5SJ4106-7HG40	HSJ		5SJ4106-8HG40	HSJ		
	8	—	—		5SJ4108-7HG40	HSJ		5SJ4108-8HG40	HSJ		
	10	5SJ4110-6HG40	HSJ		5SJ4110-7HG40	HSJ		5SJ4110-8HG40	HSJ		
	13	5SJ4113-6HG40	HSJ		5SJ4113-7HG40	HSJ		5SJ4113-8HG40	HSJ		
	15	5SJ4118-6HG40	HSJ		5SJ4118-7HG40	HSJ		5SJ4118-8HG40	HSJ		
	16	5SJ4116-6HG40	HSJ		5SJ4116-7HG40	HSJ		5SJ4116-8HG40	HSJ		
	20	5SJ4120-6HG40	HSJ		5SJ4120-7HG40	HSJ		5SJ4120-8HG40	HSJ		
	25	5SJ4125-6HG40	HSJ		5SJ4125-7HG40	HSJ		5SJ4125-8HG40	NSJ		
	30	5SJ4130-6HG40	HSJ		5SJ4130-7HG40	HSJ		5SJ4130-8HG40	NSJ		
	32	5SJ4132-6HG40	HSJ		5SJ4132-7HG40	HSJ		5SJ4132-8HG40	NSJ		
	35	5SJ4135-6HG40	HSJ		5SJ4135-7HG40	HSJ		5SJ4135-8HG40	NSJ		
	40	5SJ4140-6HG40	HSJ		5SJ4140-7HG40	HSJ		5SJ4140-8HG40	NSJ		
	45	5SJ4145-6HG40	HSJ		5SJ4145-7HG40	NSJ		5SJ4145-8HG40	NSJ		
	50	5SJ4150-6HG40	HSJ		5SJ4150-7HG40	NSJ		5SJ4150-8HG40	NSJ		
	60	5SJ4160-6HG40	HSJ		5SJ4160-7HG40	NSJ		5SJ4160-8HG40	NSJ		
	63	5SJ4163-6HG40	HSJ		5SJ4163-7HG40	NSJ		5SJ4163-8HG40	NSJ		

1) Interrupting Rating to UL489, AC Max. RMS Symmetrical: Type NSJ = 10kA, Type HSJ = 14 kA.

Control Circuit Protection

5SJ Branch Circuit Protection




5SJ4 70 mm mounting depth

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Features

5SJ4...-HG41 miniature circuit breakers are designed to comply with UL 489 and CSA 22.2 No. 5-02 standards. They are used in single and multi-pole, branch circuit protection applications up to 240 VAC maximum and 60/125 VDC maximum. Refer to Technical Data (page 16/8) for additional information.

Selection and ordering data

	I_n	Characteristic C Order No.	Interruption Type ¹⁾	List Price \$ 1 item	Characteristic D Order No.	Interruption Type ¹⁾	List Price \$ 1 item	Weight 1 item kg
 <p>1-pole</p> <p>1 2</p>	A							
	0.3	5SJ4114-7HG41	HSJ		5SJ4114-8HG41	HSJ		0.155
	0.5	5SJ4105-7HG41	HSJ		5SJ4105-8HG41	HSJ		
	1	5SJ4101-7HG41	HSJ		5SJ4101-8HG41	HSJ		
	1.6	5SJ4115-7HG41	HSJ		5SJ4115-8HG41	HSJ		
	2	5SJ4102-7HG41	HSJ		5SJ4102-8HG41	HSJ		
	3	5SJ4103-7HG41	HSJ		5SJ4103-8HG41	HSJ		
	4	5SJ4104-7HG41	HSJ		5SJ4104-8HG41	HSJ		
	5	5SJ4111-7HG41	HSJ		5SJ4111-8HG41	HSJ		
	6	5SJ4106-7HG41	HSJ		5SJ4106-8HG41	HSJ		
	8	5SJ4108-7HG41	HSJ		5SJ4108-8HG41	HSJ		
	10	5SJ4110-7HG41	HSJ		5SJ4110-8HG41	HSJ		
	13	5SJ4113-7HG41	HSJ		5SJ4113-8HG41	HSJ		
	15	5SJ4118-7HG41	HSJ		5SJ4118-8HG41	HSJ		
	16	5SJ4116-7HG41	HSJ		5SJ4116-8HG41	HSJ		
	20	5SJ4120-7HG41	HSJ		5SJ4120-8HG41	HSJ		
	25	5SJ4125-7HG41	HSJ		5SJ4125-8HG41	NSJ		
	30	5SJ4130-7HG41	HSJ		5SJ4130-8HG41	NSJ		
	32	5SJ4132-7HG41	HSJ		5SJ4132-8HG41	NSJ		
	35	5SJ4135-7HG41	HSJ		5SJ4135-8HG41	NSJ		
	40	5SJ4140-7HG41	HSJ		5SJ4140-8HG41	NSJ		
	45	5SJ4145-7HG41	NSJ		5SJ4145-8HG41	NSJ		
 <p>2-pole</p> <p>1 3 2 4</p>	0.3	5SJ4214-7HG41	HSJ		5SJ4214-8HG41	HSJ		0.310
	0.5	5SJ4205-7HG41	HSJ		5SJ4205-8HG41	HSJ		
	1	5SJ4201-7HG41	HSJ		5SJ4201-8HG41	HSJ		
	1.6	5SJ4215-7HG41	HSJ		5SJ4215-8HG41	HSJ		
	2	5SJ4202-7HG41	HSJ		5SJ4202-8HG41	HSJ		
	3	5SJ4203-7HG41	HSJ		5SJ4203-8HG41	HSJ		
	4	5SJ4204-7HG41	HSJ		5SJ4204-8HG41	HSJ		
	5	5SJ4211-7HG41	HSJ		5SJ4211-8HG41	HSJ		
	6	5SJ4206-7HG41	HSJ		5SJ4206-8HG41	HSJ		
	8	5SJ4208-7HG41	HSJ		5SJ4208-8HG41	HSJ		
	10	5SJ4210-7HG41	HSJ		5SJ4210-8HG41	HSJ		
	13	5SJ4213-7HG41	HSJ		5SJ4213-8HG41	HSJ		
	15	5SJ4218-7HG41	HSJ		5SJ4218-8HG41	HSJ		
	16	5SJ4216-7HG41	HSJ		5SJ4216-8HG41	HSJ		
	20	5SJ4220-7HG41	HSJ		5SJ4220-8HG41	HSJ		
	25	5SJ4225-7HG41	HSJ		5SJ4225-8HG41	NSJ		
	30	5SJ4230-7HG41	HSJ		5SJ4230-8HG41	NSJ		
	32	5SJ4232-7HG41	HSJ		5SJ4232-8HG41	NSJ		
	35	5SJ4235-7HG41	HSJ		5SJ4235-8HG41	NSJ		
	40	5SJ4240-7HG41	HSJ		5SJ4240-8HG41	NSJ		
	45	5SJ4245-7HG41	NSJ		5SJ4245-8HG41	NSJ		
	50	5SJ4250-7HG41	NSJ		5SJ4250-8HG41	NSJ		
 <p>3-pole</p> <p>1 3 5 2 4 6</p>	0.3	5SJ4314-7HG41	HSJ		5SJ4314-8HG41	HSJ		0.465
	0.5	5SJ4305-7HG41	HSJ		5SJ4305-8HG41	HSJ		
	1	5SJ4301-7HG41	HSJ		5SJ4301-8HG41	HSJ		
	1.6	5SJ4315-7HG41	HSJ		5SJ4315-8HG41	HSJ		
	2	5SJ4302-7HG41	HSJ		5SJ4302-8HG41	HSJ		
	3	5SJ4303-7HG41	HSJ		5SJ4303-8HG41	HSJ		
	4	5SJ4304-7HG41	HSJ		5SJ4304-8HG41	HSJ		
	5	5SJ4311-7HG41	HSJ		5SJ4311-8HG41	HSJ		
	6	5SJ4306-7HG41	HSJ		5SJ4306-8HG41	HSJ		
	8	5SJ4308-7HG41	HSJ		5SJ4308-8HG41	HSJ		
	10	5SJ4310-7HG41	HSJ		5SJ4310-8HG41	HSJ		
	13	5SJ4313-7HG41	HSJ		5SJ4313-8HG41	HSJ		
	15	5SJ4318-7HG41	HSJ		5SJ4318-8HG41	HSJ		
	16	5SJ4316-7HG41	HSJ		5SJ4316-8HG41	HSJ		
	20	5SJ4320-7HG41	HSJ		5SJ4320-8HG41	HSJ		
	25	5SJ4325-7HG41	HSJ		5SJ4325-8HG41	NSJ		
	30	5SJ4330-7HG41	HSJ		5SJ4330-8HG41	NSJ		
	32	5SJ4332-7HG41	HSJ		5SJ4332-8HG41	NSJ		
	35	5SJ4335-7HG41	HSJ		5SJ4335-8HG41	NSJ		
	40	5SJ4340-7HG41	HSJ		5SJ4340-8HG41	NSJ		
	45	5SJ4345-7HG41	NSJ		5SJ4345-8HG41	NSJ		
	50	5SJ4350-7HG41	NSJ		5SJ4350-8HG41	NSJ		
	60	5SJ4360-7HG41	NSJ		5SJ4360-8HG41	NSJ		
	63	5SJ4363-7HG41	NSJ		5SJ4363-8HG41	NSJ		

¹⁾ Interrupting Rating to UL489, AC Max. RMS Symmetrical: Type NSJ = 10kA, Type HSJ = 14 kA.

Control Circuit Protection



5SJ Branch Circuit Protection

5SJ4 70 mm mounting depth

Features

5SJ4...-HG42 miniature circuit breakers are designed to comply with UL 489 and CSA 22.2 No. 5-02 standards. They are used in single and multi-pole, branch circuit protection and feeder applications up to 480Y/277 VAC maximum and 60/125 VDC maximum. Refer to Technical Data (page 16/8) for additional information.

Selection and ordering data

	I_n	Characteristic C Order No.	Interruption Type ¹⁾	List Price \$ 1 item	Characteristic D Order No.	Interruption Type ¹⁾	List Price \$ 1 item	Weight 1 item kg
 <p>1-pole</p> <p>1 2</p>	0.3	5SJ4114-7HG42	NSJ		5SJ4114-8HG42	NSJ		0.155
	0.5	5SJ4105-7HG42	NSJ		5SJ4105-8HG42	NSJ		
	1	5SJ4101-7HG42	NSJ		5SJ4101-8HG42	NSJ		
	1.6	5SJ4115-7HG42	NSJ		5SJ4115-8HG42	NSJ		
	2	5SJ4102-7HG42	NSJ		5SJ4102-8HG42	NSJ		
	3	5SJ4103-7HG42	NSJ		5SJ4103-8HG42	NSJ		
	4	5SJ4104-7HG42	NSJ		5SJ4104-8HG42	NSJ		
	5	5SJ4111-7HG42	NSJ		5SJ4111-8HG42	NSJ		
	6	5SJ4106-7HG42	NSJ		5SJ4106-8HG42	NSJ		
	8	5SJ4108-7HG42	NSJ		5SJ4108-8HG42	NSJ		
	10	5SJ4110-7HG42	NSJ		5SJ4110-8HG42	NSJ		
	13	5SJ4113-7HG42	NSJ		5SJ4113-8HG42	NSJ		
	15	5SJ4118-7HG42	NSJ		5SJ4118-8HG42	NSJ		
	16	5SJ4116-7HG42	NSJ		5SJ4116-8HG42	NSJ		
	20	5SJ4120-7HG42	NSJ		5SJ4120-8HG42	NSJ		
	25	5SJ4125-7HG42	NSJ		5SJ4125-8HG42	NSJ		
	30	5SJ4130-7HG42	NSJ		5SJ4130-8HG42	NSJ		
	32	5SJ4132-7HG42	NSJ		5SJ4132-8HG42	NSJ		
	35	5SJ4135-7HG42	NSJ		—	—		
	40	5SJ4140-7HG42	NSJ		—	—		
 <p>2-pole</p> <p>1 3 2 4</p>	0.3	5SJ4214-7HG42	NSJ		5SJ4214-8HG42	NSJ		0.310
	0.5	5SJ4205-7HG42	NSJ		5SJ4205-8HG42	NSJ		
	1	5SJ4201-7HG42	NSJ		5SJ4201-8HG42	NSJ		
	1.6	5SJ4215-7HG42	NSJ		5SJ4215-8HG42	NSJ		
	2	5SJ4202-7HG42	NSJ		5SJ4202-8HG42	NSJ		
	3	5SJ4203-7HG42	NSJ		5SJ4203-8HG42	NSJ		
	4	5SJ4204-7HG42	NSJ		5SJ4204-8HG42	NSJ		
	5	5SJ4211-7HG42	NSJ		5SJ4211-8HG42	NSJ		
	6	5SJ4206-7HG42	NSJ		5SJ4206-8HG42	NSJ		
	8	5SJ4208-7HG42	NSJ		5SJ4208-8HG42	NSJ		
	10	5SJ4210-7HG42	NSJ		5SJ4210-8HG42	NSJ		
	13	5SJ4213-7HG42	NSJ		5SJ4213-8HG42	NSJ		
	15	5SJ4218-7HG42	NSJ		5SJ4218-8HG42	NSJ		
	16	5SJ4216-7HG42	NSJ		5SJ4216-8HG42	NSJ		
	20	5SJ4220-7HG42	NSJ		5SJ4220-8HG42	NSJ		
	25	5SJ4225-7HG42	NSJ		5SJ4225-8HG42	NSJ		
	30	5SJ4230-7HG42	NSJ		5SJ4230-8HG42	NSJ		
	32	5SJ4232-7HG42	NSJ		5SJ4232-8HG42	NSJ		
	35	5SJ4235-7HG42	NSJ		—	—		
	40	5SJ4240-7HG42	NSJ		—	—		
 <p>3-pole</p> <p>1 3 5 2 4 6</p>	0.3	5SJ4314-7HG42	NSJ		5SJ4314-8HG42	NSJ		0.465
	0.5	5SJ4305-7HG42	NSJ		5SJ4305-8HG42	NSJ		
	1	5SJ4301-7HG42	NSJ		5SJ4301-8HG42	NSJ		
	1.6	5SJ4315-7HG42	NSJ		5SJ4315-8HG42	NSJ		
	2	5SJ4302-7HG42	NSJ		5SJ4302-8HG42	NSJ		
	3	5SJ4303-7HG42	NSJ		5SJ4303-8HG42	NSJ		
	4	5SJ4304-7HG42	NSJ		5SJ4304-8HG42	NSJ		
	5	5SJ4311-7HG42	NSJ		5SJ4311-8HG42	NSJ		
	6	5SJ4306-7HG42	NSJ		5SJ4306-8HG42	NSJ		
	8	5SJ4308-7HG42	NSJ		5SJ4308-8HG42	NSJ		
	10	5SJ4310-7HG42	NSJ		5SJ4310-8HG42	NSJ		
	13	5SJ4313-7HG42	NSJ		5SJ4313-8HG42	NSJ		
	15	5SJ4318-7HG42	NSJ		5SJ4318-8HG42	NSJ		
	16	5SJ4316-7HG42	NSJ		5SJ4316-8HG42	NSJ		
	20	5SJ4320-7HG42	NSJ		5SJ4320-8HG42	NSJ		
	25	5SJ4325-7HG42	NSJ		5SJ4325-8HG42	NSJ		
	30	5SJ4330-7HG42	NSJ		5SJ4330-8HG42	NSJ		
	32	5SJ4332-7HG42	NSJ		5SJ4332-8HG42	NSJ		
	35	5SJ4335-7HG42	NSJ		—	—		
	40	5SJ4340-7HG42	NSJ		—	—		

¹⁾ Interrupting Rating to UL489, AC Max. RMS Symmetrical: Type NSJ = 10kA.

Control Circuit Protection

5SJ Branch Circuit Protection










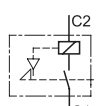




Additional components for 5SJ4 Branch Circuit Protection

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Features

- For use with the **5SJ4...-HG4** family of miniature circuit breakers
- UL Listed and CSA Certified to UL 489

Selection and ordering data

			Order No.	List Price \$	Weight 1 item
				1 item	kg
	Auxiliary switches (AS)				
	 1 NO + 1 NC		5ST 3010-0HG		0.050
	 2 NO		5ST 3011-0HG		
	 2 NC		5ST 3012-0HG		
	Fault signal contacts (FC)				
	 1 NO + 1 NC		5ST 3020-0HG		0.050
	 2 NO		5ST 3021-0HG		
	 2 NC		5ST 3022-0HG		
	Shunt trip (ST)				
	 110 - 480 VAC		5ST 3030-0HG		0.098
	 24 - 60 V AC/DC		5ST 3031-0HG		0.098
	Busbars	Length			
	Fixed lengths, cannot be cut¹⁾				
	1-Pole	For 6 MCBs 100 mm For 12 MCBs 205 mm For 18 MCBs 310 mm	5ST 3663-0HG 5ST 3663-1HG 5ST 3663-2HG		0.056 0.112 0.170
	2-Pole	For 3 MCBs 100 mm For 6 MCBs 205 mm For 9 MCBs 310 mm	5ST 3664-0HG 5ST 3664-1HG 5ST 3664-2HG		0.065 0.137 0.211
	3-Pole	For 2 MCBs 100 mm For 4 MCBs 205 mm For 6 MCBs 310 mm	5ST 3665-0HG 5ST 3665-1HG 5ST 3665-2HG		0.067 0.155 0.243
	Connection terminals				
	Infeed - MCBs	35 mm ²	5ST 3666-0HG		0.033
	Infeed - busbars	50 mm ²	5ST 3666-2HG		0.034
	Touch protection covers²⁾				
		3 x 1 pin	5ST 3666-1HG		0.003

1) Cut-able BusBars Availability to be announced.

2) Always cover all exposed terminals with touch protection covers 5ST3666-1HG.

Control Circuit Protection

General Data

5SJ4 Branch Circuit Protection

Technical data

		5SJ41...-HG40	5SJ4...-HG41	5SJ4...-HG42
Standards Certifications		EN 60898; EN 60947-2; UL 489; CSA C22.2 No. 5-02 CE; cULus, UL File No. E243414		
Tripping characteristic		B, C, D		C, D
Number of poles		1		1, 2 & 3
Operating voltage - IEC 60898 - UL 489 and CSA C22.2 No. 5-02	Min. V AC/DC	24		
	Max. V DC/pole	60		
	Max. V AC	440		
	Max. V AC	240 Same Polarity	240	480Y/277
	V DC/1P	60	60	60
	V DC/2P, 3P	—	125	125
Interrupting rating ¹⁾ - I _{cn} to IEC 60898-1 - UL 489 and CSA C22.2 No. 5-02 AC: Max. RMS Symmetrical	kA AC	10		
		Type NSJ: 10kA		
		Type HSJ: 14kA		
	kA AC	Type NSJ: 10kA		
Touch protection to EN 50274		Yes		
Degree of protection to EN 60529		IP20, with connected conductors		
CFC and silicone free		Yes		
Mounting		On standard mounting rail (DIN 35 mm)		
Device depth	mm	70		
Terminals				
- Identical screw terminals on both line and load sides		Yes		
- Terminal tightening torque	lb. in.	31		
	Nm	3.5		
Conductor cross sections	mm ²	Solid and Stranded: 0.75 to 35		
	mm ²	Finely Stranded, with end sleeve: 0.75 to 25		
	AWG	14 to 4, 60/75°C, Cu Only		
Calibration Base	°C	40 (UL 489) 30 (EN 60898)		
Average service life, with rated load		20,000 actuations		
Ambient temperature	°C	-25 to 45, occasionally +55, max. 95% humidity		
Storage Temperature	°C	-40 to +75		
Resistance to vibration to IEC 60068-2-6	m/s ²	60 at 10 Hz to 150 Hz		

1) See Selection and ordering data for specific device interrupting rating

Busbar & Connecting Terminals

Material Version		Busbars		Connecting Terminals	
		5ST3663		5ST3666-0HG	
		5ST3664			
		5ST3665		5ST3666-2HG	
Standards		UL 489			
Certifications		UL Listed, File No. E243414			
Operating voltage					
- IEC 60898	VAC	690			
- UL 489	VAC	480Y/277 and 240			
Rated current to 40°C	A	115			
Busbar cross section	mm ²	16 (Copper)			
Conductor cross sections	Solid and Stranded mm ²	-	2.5 to 35	2.5 to 50	
	AWG	-	14 to 2	14 to 1	
Terminal tightening torque	lb. in.	-	30	30	
	Nm	-	3.3	3.3	
Temperature Resistance	°C	200 - UL 94-V0/0.4mm			

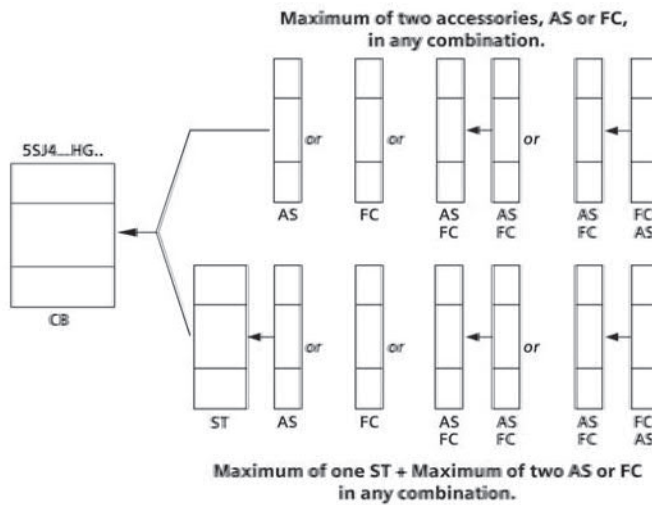
Technical data

Auxiliary Switch (AS), Fault Signal Contacts (FC) and Shunt Trip (ST)

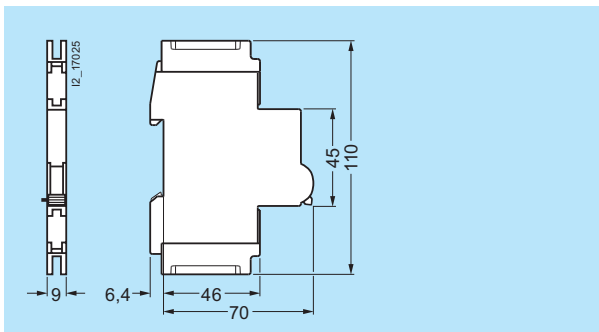
Material Version		AS	FC	ST	
		5ST301.-0HG	5ST302.-0HG	5ST3030-0HG	5ST3032-0HG
Standards		UL 489; CSA C22.2 No. 5-02			IEC/EN 60947-1
		IEC/EN 62019, IEC/EN 60947-5-1			
Certifications		CE, UL 489, CSA, UL File No. E321559			
Rated voltages/-load		IEC AC V 400 230		110 to 415	24 to 60
		AC A 2 6 (NC:AC13, NO: AC14)		-	-
		DC V 220 110 60 24		110	24 to 60
		DC A 1 1 3 6 (DC 13)		-	-
		UL AC V 480 277 240 120		110 to 480	24 to 60
		AC A 1.5 3 4 6		-	-
		DC V 125 60		-	24 to 60
		DC A 1 3		-	-
Contact load		min. 50 mA, 24 V		-	-
Conductor cross-sections	AWG mm²	22 ... 14		22 ... 14	
		0.5 ... 2.5		0.5 ... 2.5	
Terminals - terminal tightening torque	Nm	0.5 max.		0.8 max.	
	lb/in.	4.5		6.8	

Applications

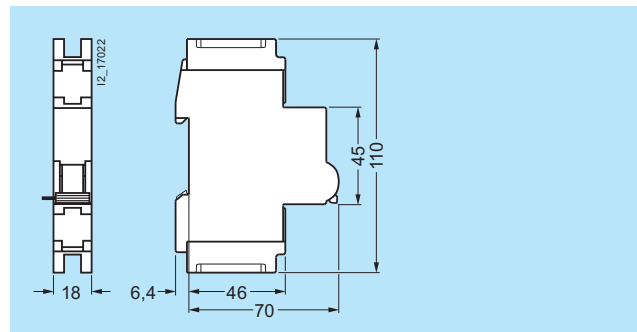
Auxiliary Switch (AS), Fault Signal Contact (FC) and Shunt Trip (ST) accessories are used with 5SJ4...-HG4. miniature circuit breakers (CB) and are mounted to the right of them.



Dimensions



5ST3 010-0HG 5ST3 011-0HG 5ST3 012-0HG
5ST3 020-0HG 5ST3 021-0HG 5ST3 022-0HG

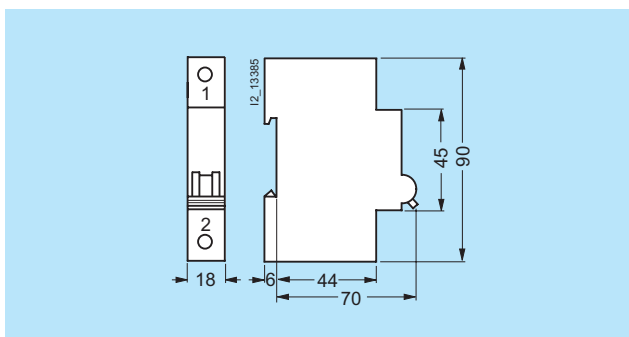


5ST3 030-0HG 5ST3 031-0HG

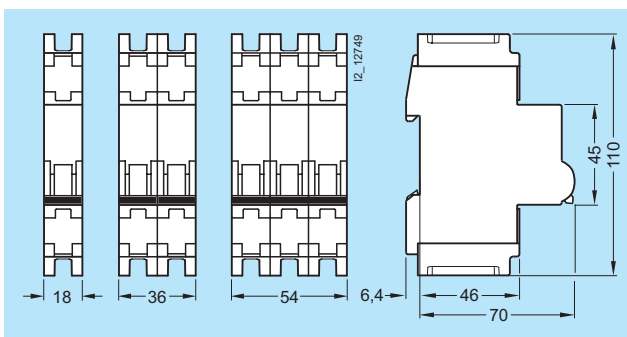
Control Circuit Protection

General Data

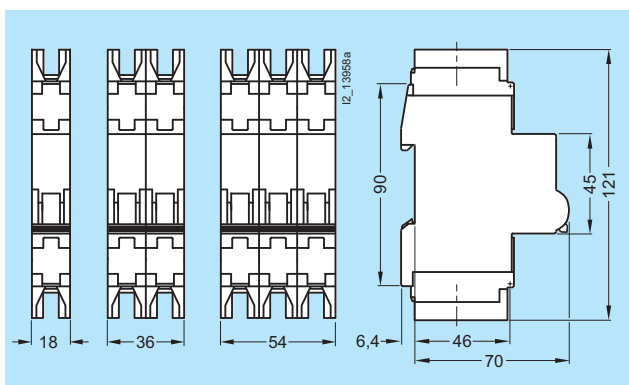
Dimensions



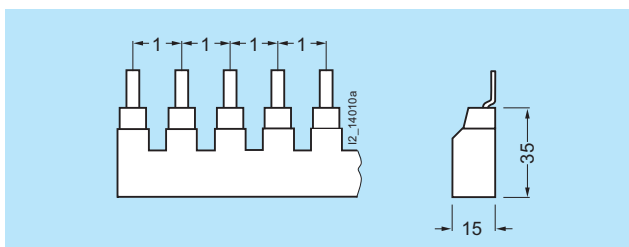
5SJ4...-HG40



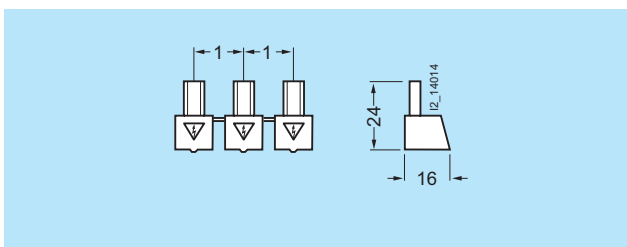
5SJ4...-HG41



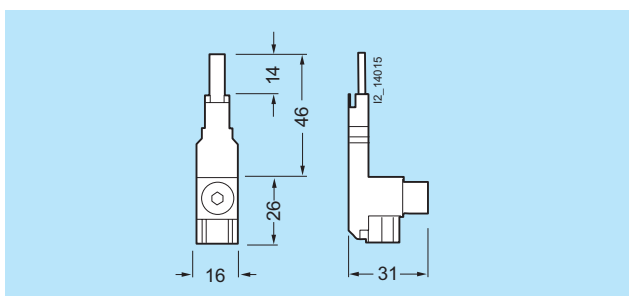
5SJ4...-HG42



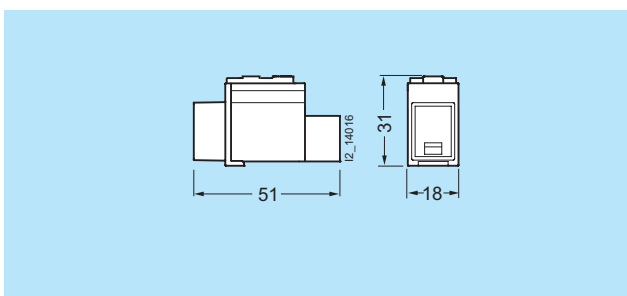
5ST3 663-0HG 5ST3 664-0HG 5ST3 665-0HG
5ST3 663-1HG 5ST3 664-1HG 5ST3 665-1HG
5ST3 663-2HG 5ST3 664-2HG 5ST3 665-2HG



5ST3 666-1HG



5ST3 666-0HG



5ST3 666-2HG

5SY and 5SP supplementary protection

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Application

Siemens' UL 1077 Supplementary Protectors are designed to provide additional protection along with a branch circuit protection device. Since our Supplementary protectors are made to trip faster than a standard UL 489 Circuit Breaker they are able to provide additional protection for more sensitive devices inside the panel. Supplementary protectors can be used in a number of industrial applications such as to provide selectivity for multiple motor control circuits on the secondary side of a control transformer or power supply by allowing the user to quickly find the problem circuit should a fault occur without having to shut down all of the other control circuits. Supplementary protectors may also be used as a local disconnecting means inside the panel when a branch circuit protection device is already present.

Always remember to follow the National Electric code when wiring your panel for applications within the United States.

Design

Supplementary protectors are equipped with a delayed overload/time-dependent thermal release (thermal bimetal) for low overcurrents and with an instantaneous electromagnetic release for high overload and short-circuit currents.

The special contact materials used virtually guarantee a long service life and offer a high degree of protection against contact welding.

Mode of operation

Thanks to the extremely fast contact separation in cases of failures and the rapid quenching of the arc consequently generated in the arcing chamber, supplementary protectors assure a safe and current-limiting off-switching.

The permissible limit- I^2t -values of the energy limitation class 3 specified in EN 60 898 are generally undercut. This guarantees an excellent selectivity towards upstream overcurrent protection devices.

Features

- High rated breaking capacity of up to 10,000 A acc. to EN 60 898 / up to 15 kA acc. to EN 60 947-2
- Excellent current limiting and selectivity characteristics
- Tripping characteristic A, B, C and D
- Terminals offer protection against contact with fingers or the back of the hand acc. to the German accident prevention regulations VBG 4/ BGV A2
- Combined terminals enable a simultaneous connection of busbars and feeder cables
- Uniform components that can be quickly mounted individually, thanks to their snap-on technique
- The handle locking device virtually prevents any unauthorized operation of the handle

Features of 5SY

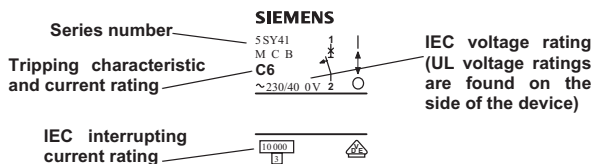
- Rapid connection of the feeder cable in front of the busbar
- Identical terminals at both sides for an optional infeed from the top or the bottom
- No tool required for mounting or dismounting
- Supports a fast and comfortable removal from the assembly
- Trip indication

Features of 5SP4

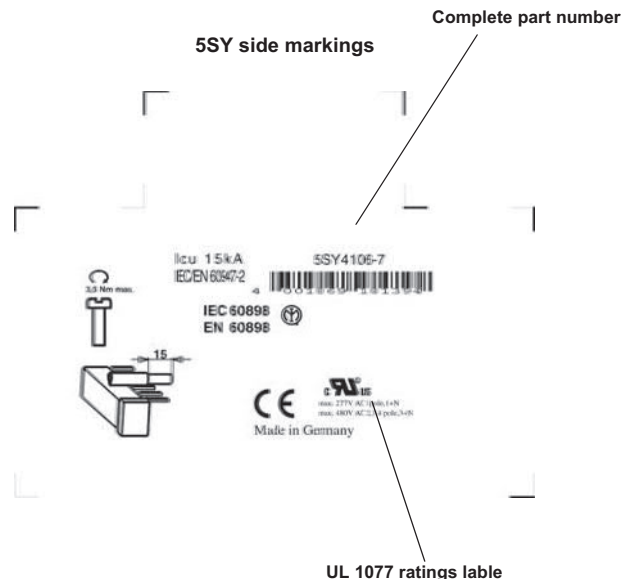
- Disconnection characteristics acc. to EN 60947-3 (DIN VDE 0660 Part 107)
- Main switch characteristics acc. to EN 60 204-1
- Can be screwed onto bases
- Separate switch position indication.

Device markings

5SY Front Markings



5SY side markings

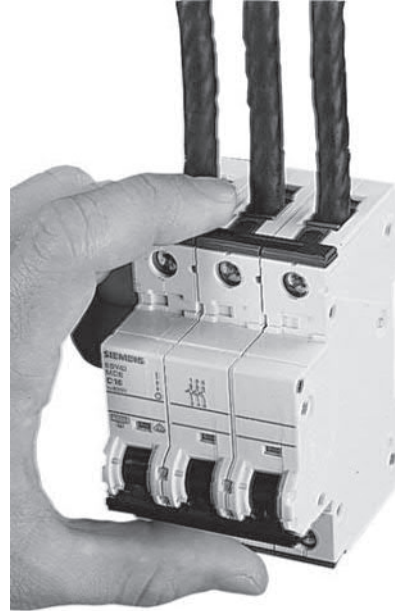
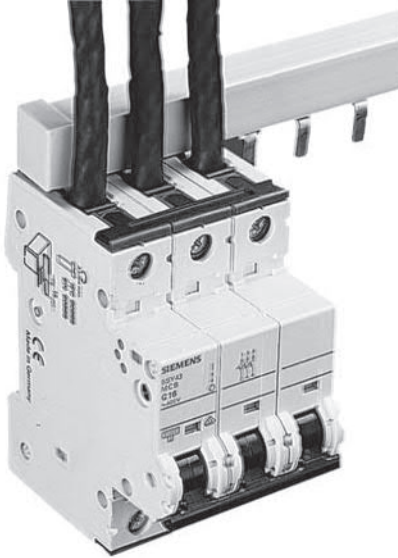


Control Circuit Protection

5SY4 Supplementary Protection

Overview

Features of 5SY supplementary protectors

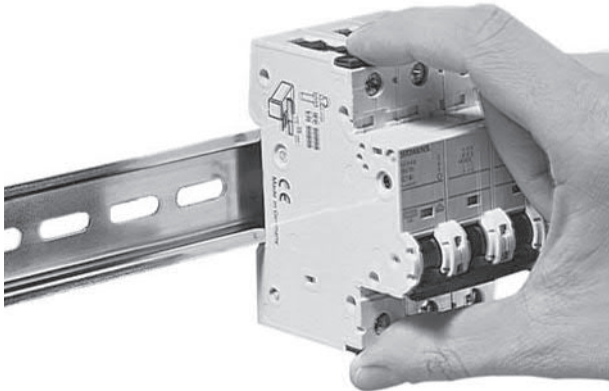


Easier, faster, enlarged wiring space

- Identical top and bottom terminals
- Connection of incoming cables vis-à-vis of the busbar
- Enlarged and easily accessible wiring space for the feeder cables
- Comfortable insertion of the incoming cables into the terminal
- Defined, visible and controllable connection of the feeder cables
- Universal infeed with top and bottom busbar mounting options.

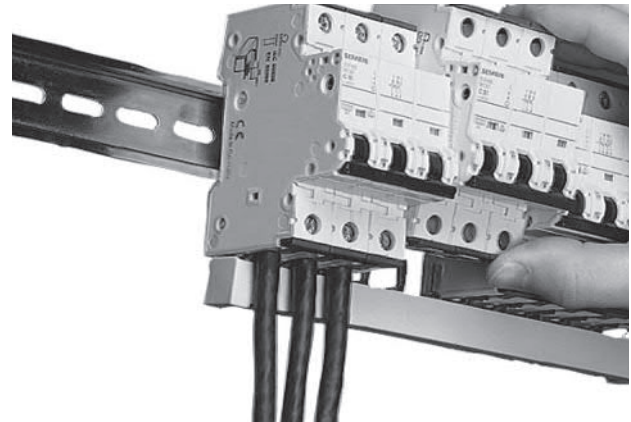
Protection against contact with clear advantages

- Integrated movable terminal covers located at the feeder cable input
- The terminals are completely closed when screws are fully tightened
- Effective protection against contact, also when the device is fully grabbed



Flexible and no use of tools required

- Manually operable quick-assembly and disassembly systems requiring no use of tools
- Fast assembly and disassembly of 5SY supplementary protectors to and from the standard mounting rail.
- All devices can be easily and comfortably replaced at any time.



Removal from the assembly

Thanks to the combination of the various features stated above, 5SY supplementary protectors can be easily and rapidly removed from the assembly when circuits need to be changed - with these devices, removal of the busbar is no longer necessary.

Control Circuit Protection







5SY4 Supplementary Protection

5SY4 70 mm mounting depth

Features

All 5SY4 designs have been certified to **UL 1077 and CSA 22.2 No. 235-M 89** and can therefore be used as "supplementary protectors" for applications up to 277 V AC (1-pole and 1-pole + N designs) and 480 V AC (2-pole, 3-pole, 3-pole + N and 4-pole designs).

Selection and ordering data

	I_n	MW	Characteristic A		Characteristic B		Characteristic C		Characteristic D		Weight 1 item kg
			Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	
 <p>1-pole</p> 	A										
	0.3	1	—	—	—	—	5SY4 114-7	—	5SY4 114-8	—	0.165
	0.5		5SY4 105-5	—	—	—	5SY4 105-7	—	5SY4 105-8	—	
	1		5SY4 101-5	—	—	—	5SY4 101-7	—	5SY4 101-8	—	
	1.6		5SY4 115-5	—	—	—	5SY4 115-7	—	5SY4 115-8	—	
	2		5SY4 102-5	—	5SY4 102-6	—	5SY4 102-7	—	5SY4 102-8	—	
	3		5SY4 103-5	—	—	—	5SY4 103-7	—	5SY4 103-8	—	
	4		5SY4 104-5	—	5SY4 104-6	—	5SY4 104-7	—	5SY4 104-8	—	
	5		—	—	—	—	5SY4 111-7	—	—	—	
	6		5SY4 106-5	—	5SY4 106-6	—	5SY4 106-7	—	5SY4 106-8	—	
	8		5SY4 108-5	—	—	—	5SY4 108-7	—	5SY4 108-8	—	
	10		5SY4 110-5	—	5SY4 110-6	—	5SY4 110-7	—	5SY4 110-8	—	
	13		5SY4 113-5	—	5SY4 113-6	—	5SY4 113-7	—	5SY4 113-8	—	
	15		—	—	—	—	5SY4 118-7	—	—	—	
	16		5SY4 116-5	—	5SY4 116-6	—	5SY4 116-7	—	5SY4 116-8	—	
	20		5SY4 120-5	—	5SY4 120-6	—	5SY4 120-7	—	5SY4 120-8	—	
	25		5SY4 125-5	—	5SY4 125-6	—	5SY4 125-7	—	5SY4 125-8	—	
	30		—	—	—	—	5SY4 130-7	—	—	—	
	32		5SY4 132-5	—	5SY4 132-6	—	5SY4 132-7	—	5SY4 132-8	—	
	35		—	—	—	—	5SY4 135-7	—	—	—	
 <p>1-pole + N</p> 	0.3	2	—	—	—	—	5SY4 514-7	—	5SY4 514-8	—	0.330
	0.5		—	—	—	—	5SY4 505-7	—	5SY4 505-8	—	
	1		5SY4 501-5	—	—	—	5SY4 501-7	—	5SY4 501-8	—	
	1.6		5SY4 515-5	—	—	—	5SY4 515-7	—	5SY4 515-8	—	
	2		5SY4 502-5	—	—	—	5SY4 502-7	—	5SY4 502-8	—	
	3		5SY4 503-5	—	—	—	5SY4 503-7	—	5SY4 503-8	—	
	4		5SY4 504-5	—	—	—	5SY4 504-7	—	5SY4 504-8	—	
	6		5SY4 506-5	—	5SY4 506-6	—	5SY4 506-7	—	5SY4 506-8	—	
	8		5SY4 508-5	—	—	—	5SY4 508-7	—	5SY4 508-8	—	
	10		5SY4 510-5	—	5SY4 510-6	—	5SY4 510-7	—	5SY4 510-8	—	
	13		5SY4 513-5	—	5SY4 513-6	—	5SY4 513-7	—	5SY4 513-8	—	
	16		5SY4 516-5	—	5SY4 516-6	—	5SY4 516-7	—	5SY4 516-8	—	
	20		5SY4 520-5	—	5SY4 520-6	—	5SY4 520-7	—	5SY4 520-8	—	
	25		5SY4 525-5	—	5SY4 525-6	—	5SY4 525-7	—	5SY4 525-8	—	
 <p>2-pole</p> 	0.3	2	—	—	—	—	5SY4 214-7	—	5SY4 214-8	—	0.330
	0.5		5SY4 205-5	—	—	—	5SY4 205-7	—	5SY4 205-8	—	
	1		5SY4 201-5	—	—	—	5SY4 201-7	—	5SY4 201-8	—	
	1.6		5SY4 215-5	—	—	—	5SY4 215-7	—	5SY4 215-8	—	
	2		5SY4 202-5	—	—	—	5SY4 202-7	—	5SY4 202-8	—	
	3		5SY4 203-5	—	—	—	5SY4 203-7	—	5SY4 203-8	—	
	4		5SY4 204-5	—	—	—	5SY4 204-7	—	5SY4 204-8	—	
	5		—	—	—	—	5SY4 211-7	—	—	—	
	6		5SY4 206-5	—	5SY4 206-6	—	5SY4 206-7	—	5SY4 206-8	—	
	8		5SY4 208-5	—	—	—	5SY4 208-7	—	5SY4 208-8	—	
	10		5SY4 210-5	—	5SY4 210-6	—	5SY4 210-7	—	5SY4 210-8	—	
	13		5SY4 213-5	—	5SY4 213-6	—	5SY4 213-7	—	5SY4 213-8	—	
	15		—	—	—	—	5SY4 218-7	—	—	—	
	16		5SY4 216-5	—	5SY4 216-6	—	5SY4 216-7	—	5SY4 216-8	—	
	20		5SY4 220-5	—	5SY4 220-6	—	5SY4 220-7	—	5SY4 220-8	—	
	25		5SY4 225-5	—	5SY4 225-6	—	5SY4 225-7	—	5SY4 225-8	—	
	30		—	—	—	—	5SY4 230-7	—	—	—	
	32		5SY4 232-5	—	5SY4 232-6	—	5SY4 232-7	—	5SY4 232-8	—	
	35		—	—	—	—	5SY4 235-7	—	—	—	
	40		5SY4 240-5	—	5SY4 240-6	—	5SY4 240-7	—	5SY4 240-8	—	
	45		—	—	—	—	5SY4 245-7	—	—	—	
	50		5SY4 250-5	—	5SY4 250-6	—	5SY4 250-7	—	5SY4 250-8	—	
	60		—	—	—	—	5SY4 260-7	—	—	—	
	63		5SY4 263-5	—	5SY4 263-6	—	5SY4 263-7	—	5SY4 263-8	—	

1 MW = modular width
of 18 mm. Depth = 70
mm.

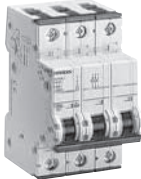





Control Circuit Protection

5SY4 Supplementary Protection

5SY4 70 mm mounting depth

Selection and ordering data

All 5SY4 designs have been certified acc. to **UL 1077** and **CSA 22.2 No. 235-M 89** and can therefore be used as "supplementary protectors" for applications of up to 277 V AC (1-pole and 1-pole + N designs) and 480 V AC (2-pole, 3-pole, 3-pole + N and 4-pole designs).

		I_n	MW	Characteristic A Order No. List Price \$ 1 item	Characteristic B Order No. List Price \$ 1 item	Characteristic C Order No. List Price \$ 1 item	Characteristic D Order No. List Price \$ 1 item	Weight 1 item kg
 3-pole 		0.3	3	—	—	5SY4 314-7	5SY4 314-8	0.495
		0.5		5SY4 305-5	—	5SY4 305-7	5SY4 305-8	
		1		5SY4 301-5	—	5SY4 301-7	5SY4 301-8	
		1.6		5SY4 315-5	—	5SY4 315-7	5SY4 315-8	
		2		5SY4 302-5	—	5SY4 302-7	5SY4 302-8	
		3		5SY4 303-5	—	5SY4 303-7	5SY4 303-8	
		4		5SY4 304-5	—	5SY4 304-7	5SY4 304-8	
		5		—	—	5SY4 311-7	—	
		6		5SY4 306-5	5SY4 306-6	5SY4 306-7	5SY4 306-8	
		8		5SY4 308-5	—	5SY4 308-7	5SY4 308-8	
		10		5SY4 310-5	5SY4 310-6	5SY4 310-7	5SY4 310-8	
		13		5SY4 313-5	5SY4 313-6	5SY4 313-7	5SY4 313-8	
		15		—	—	5SY4 318-7	—	
		16		5SY4 316-5	5SY4 316-6	5SY4 316-7	5SY4 316-8	
		20		5SY4 320-5	5SY4 320-6	5SY4 320-7	5SY4 320-8	
		25		5SY4 325-5	5SY4 325-6	5SY4 325-7	5SY4 325-8	
		30		—	—	5SY4 330-7	—	
		32		5SY4 332-5	5SY4 332-6	5SY4 332-7	5SY4 332-8	
		35		—	—	5SY4 335-7	—	
		40		5SY4 340-5	5SY4 340-6	5SY4 340-7	5SY4 340-8	
		45		—	—	5SY4 345-7	—	
		50		5SY4 350-5	5SY4 350-6	5SY4 350-7	5SY4 350-8	
	60	—	—	5SY4 360-7	—			
	63	5SY4 363-5	5SY4 363-6	5SY4 363-7	5SY4 363-8			
 3-pole + N 		0.3	4	—	—	5SY4 614-7	5SY4 614-8	0.660
		0.5		—	—	5SY4 605-7	5SY4 605-8	
		1		5SY4 601-5	—	5SY4 601-7	5SY4 601-8	
		1.6		5SY4 615-5	—	5SY4 615-7	5SY4 615-8	
		2		5SY4 602-5	—	5SY4 602-7	5SY4 602-8	
		3		5SY4 603-5	—	5SY4 603-7	5SY4 603-8	
		4		5SY4 604-5	—	5SY4 604-7	5SY4 604-8	
		6		5SY4 606-5	5SY4 606-6	5SY4 606-7	5SY4 606-8	
		8		5SY4 608-5	—	5SY4 608-7	5SY4 608-8	
		10		5SY4 610-5	5SY4 610-6	5SY4 610-7	5SY4 610-8	
		13		5SY4 613-5	5SY4 613-6	5SY4 613-7	5SY4 613-8	
		16		5SY4 616-5	5SY4 616-6	5SY4 616-7	5SY4 616-8	
		20		5SY4 620-5	5SY4 620-6	5SY4 620-7	5SY4 620-8	
		25		5SY4 625-5	5SY4 625-6	5SY4 625-7	5SY4 625-8	
		32		5SY4 632-5	5SY4 632-6	5SY4 632-7	5SY4 632-8	
		40		5SY4 640-5	5SY4 640-6	5SY4 640-7	5SY4 640-8	
		50		5SY4 650-5	5SY4 650-6	5SY4 650-7	5SY4 650-8	
		63		5SY4 663-5	5SY4 663-6	5SY4 663-7	5SY4 663-8	
 4-pole 		0.3	4	—	—	5SY4 414-7	5SY4 414-8	0.660
		0.5		—	—	5SY4 405-7	5SY4 405-8	
		1		5SY4 401-5	—	5SY4 401-7	5SY4 401-8	
		1.6		5SY4 415-5	—	5SY4 415-7	5SY4 415-8	
		2		5SY4 402-5	—	5SY4 402-7	5SY4 402-8	
		3		5SY4 403-5	—	5SY4 403-7	5SY4 403-8	
		4		5SY4 404-5	—	5SY4 404-7	5SY4 404-8	
		6		5SY4 406-5	5SY4 406-6	5SY4 406-7	5SY4 406-8	
		8		5SY4 408-5	—	5SY4 408-7	5SY4 408-8	
		10		5SY4 410-5	5SY4 410-6	5SY4 410-7	5SY4 410-8	
		13		5SY4 413-5	5SY4 413-6	5SY4 413-7	5SY4 413-8	
		16		5SY4 416-5	5SY4 416-6	5SY4 416-7	5SY4 416-8	
		20		5SY4 420-5	5SY4 420-6	5SY4 420-7	5SY4 420-8	
		25		5SY4 425-5	5SY4 425-6	5SY4 425-7	5SY4 425-8	
		32		5SY4 432-5	5SY4 432-6	5SY4 432-7	5SY4 432-8	
		40		5SY4 440-5	5SY4 440-6	5SY4 440-7	5SY4 440-8	
		50		5SY4 450-5	5SY4 450-6	5SY4 450-7	5SY4 450-8	
		63		5SY4 463-5	5SY4 463-6	5SY4 463-7	5SY4 463-8	

1 MW = modular
width of 18 mm.
Depth = 70 mm.

1 MW = modular
width of 18 mm.
Depth = 70 mm.

Control Circuit Protection



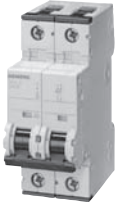
5SY6 Supplementary Protection

5SY6 70 mm mounting depth

Features

All 5SY6 designs have been certified to **UL 1077 and CSA 22.2 No. 235-M 89** and can therefore be used as "supplementary protectors" for applications up to 277 V AC (1-pole and 1-pole + N designs) and 480 V AC (2-pole, 3-pole, 3-pole + N and 4-pole designs). The only difference between 5SY4 and 5SY6 is the IEC 60898-1 Interrupting Rating. 5SY4 has 10kA and 5SY6 has 6kA Interrupting rating according to IEC 60898-1. However, UL Interrupting ratings are the same for 5SY4 and 5SY6.

Selection and ordering data

	I_n	Mounting width	DT	Characteristic B Order No.	Price per PU	PG	DT	Characteristic C Order No.	Price per PU	PU (UNIT, SET, M)	PS*/ P. unit	PG	Weight per PU approx. kg
	A	MW ¹⁾											
	MCBs 6000 A			—				5SY6 114-7		1	1 unit	001	0.167
	1-Pole, 230/400 V AC			—				5SY6 105-7		1	1/12 units	001	0.165
	0.3	1		—				5SY6 101-7		1	1/12 units	001	0.164
	0.5			—				5SY6 115-7		1	1 unit	001	0.162
	1			—				5SY6 102-7		1	1/12 units	001	0.153
	1.6			—				5SY6 103-7		1	1/12 units	001	0.145
	2			5SY6 102-6		001	▶	5SY6 104-7		1	1/12 units	001	0.160
	3			5SY6 104-6		001	▶	5SY6 111-7		1	1/12 units	001	0.160
	4			—				5SY6 106-7		1	1/12 units	001	0.160
	5			—				5SY6 106-6		1	1/12 units	001	0.160
	6		▶	5SY6 106-6		001	▶	5SY6 108-7		1	1/12 units	001	0.158
	8			—				5SY6 110-7		1	1/12 units	001	0.158
	10		▶	5SY6 110-6		001	▶	5SY6 113-7		1	1/12 units	001	0.148
	13			5SY6 113-6		001		5SY6 118-7		1	1/12 units	001	0.160
	15			—				5SY6 116-7		1	1/12 units	001	0.158
	16		▶	5SY6 116-6		001	▶	5SY6 120-7		1	1/12 units	001	0.162
	20			5SY6 120-6		001		5SY6 125-7		1	1/12 units	001	0.163
	25			5SY6 125-6		001		5SY6 130-7		1	1/12 units	001	0.160
	30			—				5SY6 132-7		1	1/12 units	001	0.149
	32			5SY6 132-6		001		5SY6 140-7		1	1/12 units	001	0.150
	40			5SY6 140-6		001		5SY6 150-7		1	1/12 units	001	0.168
	50			5SY6 150-6		001		5SY6 163-7		1	1/12 units	001	0.172
	63			5SY6 163-6		001							
	1-Pole + N, 230 V AC			—				5SY6 514-7		1	1 unit	001	0.328
	0.3	2		—				5SY6 505-7		1	1 unit	001	0.325
	0.5			—				5SY6 501-7		1	1 unit	001	0.321
	1			—				5SY6 515-7		1	1 unit	001	0.318
	1.6			—				5SY6 502-7		1	1 unit	001	0.324
	2			5SY6 506-6		001		5SY6 503-7		1	1 unit	001	0.314
	3			—				5SY6 504-7		1	1 unit	001	0.314
	4			5SY6 510-6		001		5SY6 506-7		1	1/6 units	001	0.310
	6			5SY6 513-6		001		5SY6 508-7		1	1 unit	001	0.310
	8			—				5SY6 510-7		1	1/6 units	001	0.301
	10			5SY6 510-6		001		5SY6 513-7		1	1/6 units	001	0.320
	13			5SY6 513-6		001		5SY6 218-7		1	1/12 units	001	0.160
	15			—				5SY6 516-7		1	1/6 units	001	0.302
	16			5SY6 516-6		001		5SY6 520-7		1	1 unit	001	0.316
	20			5SY6 520-6		001		5SY6 525-7		1	1 unit	001	0.318
	25			5SY6 525-6		001		5SY6 532-7		1	1 unit	001	0.319
	32			5SY6 532-6		001		5SY6 540-7		1	1 unit	001	0.318
	40			5SY6 540-6		001		5SY6 550-7		1	1 unit	001	0.323
	50			5SY6 550-6		001		5SY6 563-7		1	1 unit	001	0.343
	63			5SY6 563-6		001							
	2-Pole, 400 V AC			—				5SY6 214-7		1	1 unit	001	0.328
	0.3	2		—				5SY6 205-7		1	1 unit	001	0.324
	0.5			—				5SY6 201-7		1	1/6 units	001	0.302
	1			—				5SY6 215-7		1	1 unit	001	0.317
	1.6			—			▶	5SY6 202-7		1	1/6 units	001	0.324
	2			—				5SY6 203-7		1	1/6 units	001	0.320
	3			—			▶	5SY6 204-7		1	1/6 units	001	0.300
	4			—				5SY6 211-7		1	1/12 units	001	0.160
	5			—				5SY6 206-7		1	1/6 units	001	0.292
	6			5SY6 206-6		001	▶	5SY6 208-7		1	1 unit	001	0.309
	8			—				5SY6 210-7		1	1/6 units	001	0.310
	10			5SY6 210-6		001	▶	5SY6 213-7		1	1 unit	001	0.318
	13			5SY6 213-6		001		5SY6 218-7		1	1/12 units	001	0.160
	15			—				5SY6 216-7		1	1/6 units	001	0.291
	16			5SY6 216-6		001	▶	5SY6 220-7		1	1/6 units	001	0.300
	20			5SY6 220-6		001		5SY6 225-7		1	1/6 units	001	0.308
	25			5SY6 225-6		001		5SY6 230-7		1	1/12 units	001	0.160
	30			—				5SY6 232-7		1	1/6 units	001	0.318
	32			5SY6 232-6		001		5SY6 240-7		1	1 unit	001	0.318
	40			5SY6 240-6		001		5SY6 250-7		1	1 unit	001	0.330
	50			5SY6 250-6		001		5SY6 263-7		1	1 unit	001	0.340
	63			5SY6 263-6		001							

¹⁾ 1 MW (modular width) = 18 mm.




* Availability to be announced

Control Circuit Protection

5SY6 Supplementary Protection

5SY6 70 mm mounting depth (cont.)

Selection and ordering data

	I_n	Mounting width	DT	Characteristic B		PG	DT	Characteristic C		PU (UNIT, SET, M)	PS*/ P. unit	PG	Weight per PU approx. kg
				Order No.	Price per PU			Order No.	Price per PU				
MCBs 6000 A 3-Pole, 400 V AC 	A	MW ¹⁾											
	0.3	3		—				5SY6 314-7		1	1 unit	001	0.489
	0.5			—				5SY6 305-7		1	1 unit	001	0.481
	1			—				5SY6 301-7		1	1 unit	001	0.473
	1.6			—				5SY6 315-7		1	1 unit	001	0.471
	2			—				5SY6 302-7		1	1/4 units	001	0.480
	3			—				5SY6 303-7		1	1 unit	001	0.465
	4			—				5SY6 304-7		1	1/4 units	001	0.458
	5			—				5SY6 311-7		1	1/12 units	001	0.160
	6			5SY6 306-6		001	▶	5SY6 306-7		1	1/4 units	001	0.435
	8			—				5SY6 308-7		1	1 unit	001	0.461
	10			5SY6 310-6		001	▶	5SY6 310-7		1	1/4 units	001	0.443
	13			5SY6 313-6		001		5SY6 313-7		1	1 unit	001	0.471
	15			—				5SY6 318-7		1	1/12 units	001	0.160
	16		▶	5SY6 316-6		001	▶	5SY6 316-7		1	1/4 units	001	0.437
	20			5SY6 320-6		001		5SY6 320-7		1	1/4 units	001	0.455
	25			5SY6 325-6		001		5SY6 325-7		1	1/4 units	001	0.464
	30			—				5SY6 330-7		1	1/12 units	001	0.160
	32			5SY6 332-6		001	▶	5SY6 332-7		1	1/4 units	001	0.459
	40			5SY6 340-6		001		5SY6 340-7		1	1/4 units	001	0.472
	50			5SY6 350-6		001		5SY6 350-7		1	1/4 units	001	0.489
	63			5SY6 363-6		001		5SY6 363-7		1	1/4 units	001	0.488
3-Pole + N, 400 V AC 	0.3	4		—				5SY6 614-7		1	1 unit	001	0.631
	0.5			—				5SY6 605-7		1	1 unit	001	0.643
	1			—				5SY6 601-7		1	1 unit	001	0.623
	1.6			—				5SY6 615-7		1	1 unit	001	0.631
	2			—				5SY6 602-7		1	1 unit	001	0.632
	3			—				5SY6 603-7		1	1 unit	001	0.590
	4			—				5SY6 604-7		1	1 unit	001	0.620
	6			5SY6 606-6		001		5SY6 606-7		1	1 unit	001	0.609
	8			—				5SY6 608-7		1	1 unit	001	0.607
	10			5SY6 610-6		001		5SY6 610-7		1	1 unit	001	0.611
	13			5SY6 613-6		001		5SY6 613-7		1	1/3 units	001	0.630
	16			5SY6 616-6		001		5SY6 616-7		1	1/3 units	001	0.613
	20			5SY6 620-6		001		5SY6 620-7		1	1 unit	001	0.623
	25			5SY6 625-6		001		5SY6 625-7		1	1 unit	001	0.622
	32			5SY6 632-6		001		5SY6 632-7		1	1 unit	001	0.628
	40			5SY6 640-6		001		5SY6 640-7		1	1 unit	001	0.629
	50			5SY6 650-6		001		5SY6 650-7		1	1 unit	001	0.655
	63			5SY6 663-6		001		5SY6 663-7		1	1 unit	001	0.671
4-Pole, 400 V AC 	0.3	4		—				5SY6 414-7		1	1 unit	001	0.640
	0.5			—				5SY6 405-7		1	1 unit	001	0.641
	1			—				5SY6 401-7		1	1 unit	001	0.634
	1.6			—				5SY6 415-7		1	1 unit	001	0.620
	2			—				5SY6 402-7		1	1 unit	001	0.642
	3			—				5SY6 403-7		1	1 unit	001	0.625
	4			—				5SY6 404-7		1	1 unit	001	0.615
	6			5SY6 406-6		001		5SY6 406-7		1	1 unit	001	0.612
	8			—				5SY6 408-7		1	1 unit	001	0.605
	10			5SY6 410-6		001		5SY6 410-7		1	1/3 units	001	0.603
	13			5SY6 413-6		001		5SY6 413-7		1	1 unit	001	0.628
	16			5SY6 416-6		001		5SY6 416-7		1	1/3 units	001	0.620
	20			5SY6 420-6		001		5SY6 420-7		1	1/3 units	001	0.598
	25			5SY6 425-6		001		5SY6 425-7		1	1/3 units	001	0.625
	32			5SY6 432-6		001		5SY6 432-7		1	1/3 units	001	0.627
	40			5SY6 440-6		001		5SY6 440-7		1	1/3 units	001	0.628
	50			5SY6 450-6		001		5SY6 450-7		1	1 unit	001	0.651
	63			5SY6 463-6		001		5SY6 463-7		1	1/3 units	001	0.673

¹⁾ 1 MW (modular width) = 18 mm.

Control Circuit Protection



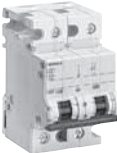



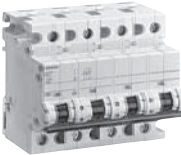

Supplementary Protection, High-Current Product Range

5SP4 70 mm mounting depth

Features

5SP4 designs have been certified to **UL 1077** and **CSA 22.2 No. 235-M 89** and can therefore be used as "supplementary protectors" for applications of up to 277 V AC (1-pole designs) and 480 V AC (2-pole, 3-pole, and 4-pole designs).

Selection and ordering data

	I_n	MW	Characteristic B		Characteristic C		Characteristic D		Weight 1 item kg
			Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	Order No.	List Price \$ 1 item	
	A								
	1-pole								
		80 100 125	1.5	5SP4 180-6 5SP4 191-6 5SP4 192-6		5SP4 180-7 5SP4 191-7 5SP4 192-7		5SP4 180-8 5SP4 191-8 -	0.258
	2-pole								
		80 100 125	3	5SP4 280-6 5SP4 291-6 5SP4 292-6		5SP4 280-7 5SP4 291-7 5SP4 292-7		5SP4 280-8 5SP4 291-8 -	0.516
	3-pole								
		80 100 125	4.5	5SP4 380-6 5SP4 391-6 5SP4 392-6		5SP4 380-7 5SP4 391-7 5SP4 392-7		5SP4 380-8 5SP4 391-8 -	0.762
	4-pole								
		80 100 125	6	5SP4 480-6 5SP4 491-6 5SP4 492-6		5SP4 480-7 5SP4 491-7 5SP4 492-7		5SP4 480-8 5SP4 491-8 -	1.032

1 MW = modular width of 18 mm.
Depth = 70 mm.

Control Circuit Protection



Supplementary Protection, AC/DC Product Range

5SY5 70 mm mounting depth

Features

- Operating voltage to EN 60898 and EN 60947-2
 - 220 V DC/pole max.
 - 440 V AC max.
- Standards: EN 60 898-1, DIN VDE 0641 Part 11, IEC 60 898
- Additional components can be retrofitted.
- **Devices do not comply with UL1077**

Selection and ordering data

	I_n	MW ¹⁾	Characteristic B Order No.	List Price \$ 1 item	Characteristic C Order No.	List Price \$ 1 item	Weight 1 item kg
 <p>1-pole</p> <p>1 2</p>	A	1	-		5SY5 114-7		0.147
	0.3		-		5SY5 105-7		
	0.5		-		5SY5 101-7		
	1		-		5SY5 115-7		
	1.6		-		5SY5 102-7		
	2		5SY5 102-6		5SY5 103-7		
	3		-		5SY5 104-7		
	4		-		5SY5 106-7		
	6		5SY5 106-6		5SY5 108-7		
	8		-		5SY5 110-7		
	10		5SY5 110-6		5SY5 113-7		
	13		5SY5 113-6		5SY5 116-7		
	16		5SY5 116-6		5SY5 120-7		
	20		5SY5 120-6		5SY5 125-7		
	25		5SY5 125-6		5SY5 132-7		
	32 ¹⁾		5SY5 132-6		5SY5 140-7		
	40		5SY5 140-6		5SY5 150-7		
 <p>2-pole</p> <p>1 3 2 4</p>	50		5SY5 150-6		5SY5 163-7		0.304
	63		5SY5 163-6				
		2	-		5SY5 214-7		
	0.3		-		5SY5 205-7		
	0.5		-		5SY5 201-7		
	1		-		5SY5 215-7		
	1.6		-		5SY5 202-7		
	2		-		5SY5 203-7		
	3		-		5SY5 204-7		
	4		-		5SY5 206-7		
	6		5SY5 206-6		5SY5 208-7		
	8		-		5SY5 210-7		
	10		5SY5 210-6		5SY5 213-7		
	13		5SY5 213-6		5SY5 216-7		
	16		5SY5 216-6		5SY5 220-7		
	20		5SY5 220-6		5SY5 225-7		
	25		5SY5 225-6		5SY5 232-7		
	32		5SY5 232-6		5SY5 240-7		
	40		5SY5 240-6		5SY5 250-7		
	50		5SY5 250-6		5SY5 263-7		
	63		5SY5 263-6				

1) MW = modular width of 18 mm.
Depth = 70 mm.

Control Circuit Protection

Supplementary Protection

Additional components for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors

Features

- UL Recognized to UL 1077 (5ST3 010, 011, 012, 020, 021 & 022)
- Individual retrofitting possible
- Assembly via factory-fitted clips
- Short-circuit protection via supplementary protectors of characteristic B or C and $I_n = 6\text{ A}$ or 6 A gL fuses
- Low output versions in accordance with EN 61131-2 for controlling PLCs

Design

Auxiliary switches (AS) and fault signal contacts (FC) (5ST30.0, 5ST30.1, 5ST30.2)

- Min. contact load: 50 mA, 24 V
- Max. contact load:
NO contacts:
2 A, 400 V AC, AC-14
6 A, 230 V AC, AC-14
1 A, 220 V DC, DC-13
1 A, 110 V DC, DC-13
3 A, 60 V DC, DC-13
6 A, 24 V DC, DC-13
NC contacts:
2 A, 400 V AC, AC-13
6 A, 230 V AC, AC-13
1 A, 220 V DC, DC-13
1 A, 110 V DC, DC-13
3 A, 60 V DC, DC-13
6 A, 24 V DC, DC-13

- Connectable to *instabus EIB* and AS-Interface bus via binary inputs

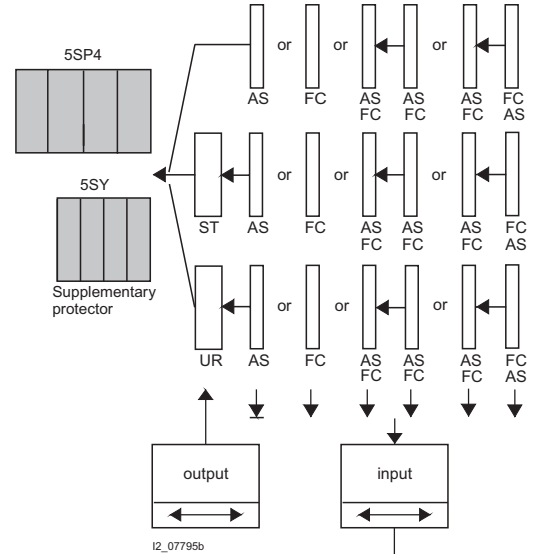
Auxiliary switches (AS) with low output (5ST3013, 5ST3014, 5ST3015)

- Area of application: 1 mA / 5 V DC to 50 mA / 30 V DC

Application

Indication of the supplementary protectors' switching state:

- AS: ON/OFF
- FC: tripped



Selection and ordering data

MW		Order No.	List Price \$ 1 item	Price group	Weight 1 item kg
	Auxiliary switches (AS) for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors				
	1 NO + 1 NC, 0.5	5ST3 010			0.050
	1 NO + 1 NC, low output ¹⁾	5ST3 013			
	2 NO	5ST3 011			
	2 NO, low output ¹⁾	5ST3 014			
	2 NC	5ST3 012			
	2 NC, low output ¹⁾	5ST3 015			
	Fault signal contacts (FC) for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors				
	1 NO + 1 NC 0.5	5ST3 020			0.050
	2 NO	5ST3 021			
	2 NC	5ST3 022			

¹⁾Not UL Rated.

Control Circuit Protection

Supplementary Protection

Additional components for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors

Features


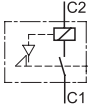
Shunt trips

- Response limits acc. to DIN VDE 0660 Part 100, 7.2.1.4
- Suitable for voltages: 110 to 415 V AC, 110 V AC, 24 to 48 V AC/DC

Application

Remote tripping of the supplementary protectors

Selection and ordering data

MW		Order No.	List Price \$ 1 item	Price group	Weight 1 item kg
	Shunt trips (ST) for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors 1) 				
	110-415 V AC 1 24-48 V AC/DC 1	5ST3 030 5ST3 031			0.098

Features


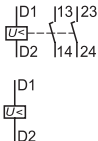
Undervoltage releases

- Response limits acc. to DIN VDE 0660 Part 100, 7.2.1.3
- Suitable for voltages: 230 V AC, 110 V DC, 24 V DC
- Connectable to *instabus EIB* and AS-Interface bus via binary inputs.

Application

- Applicable as remote trip in an EMERGENCY-OFF loop
- Assures disconnection of the control circuit acc. to EN 60 204
- In cases of interrupted or insufficient voltage, the undervoltage release trips the supplementary protector or prevents it from switching on.

Selection and ordering data

MW		Order No.	List Price \$ 1 item	Price group	Weight 1 item kg
	Undervoltage releases (UR) for 5SY4, 5SY5, 5SY6 and 5SP4 supplementary protectors 1) 				
	230 V AC 1 110 V DC 24 V DC 230 V AC 1 110 V DC 24 V DC	5ST3 040 5ST3 041 5ST3 042 5ST3 043 5ST3 044 5ST3 045			0.115

1) Not UL/CSA Rated.

Features

- For use with 5SY and 5SP supplementary protectors
- UL and CSA Certified to UL 508

Selection and ordering data



	Length	For use with 5SY			For use with 5SP ³⁾		
		Order No.	List Price \$ 1 item	Weight 1 item kg	Order No.	List Price \$ 1 item	Weight 1 item kg
	mm						
Busbars²⁾ without end caps (can be cut)							
1-pole	1000	5ST3 701-0HG		0.330	5ST3 701-2HG		0.450
1-pole + AS or FC ¹⁾		5ST3 703-0HG			-		
2-pole	1000	5ST3 705-0HG		0.508	5ST3 705-2HG		0.690
2-pole + AS or FC ¹⁾		5ST3 707-0HG			-		
3-pole	1000	5ST3 710-0HG		0.800	5ST3 710-2HG		1.090
3-pole + AS or FC ¹⁾		5ST3 712-0HG			-		
Busbar End Caps							
1-pole		5ST3 748-0HG		0.001	5ST3 748-0HG		0.001
2- & 3- pole		5ST3 750-0HG			5ST3 750-0HG		
Connection terminals							
Infeed - MCBs	Wire size 6 - 35 mm ² 10 - 1/0 AWG	5ST3 770-0HG		0.035	5ST3 770-0HG		0.035
Infeed - busbars	1.5 - 50 mm ² 14 - 1 AWG	5ST3 770-1HG		0.016	5ST3 770-1HG		0.016
Touch protection covers²⁾							
5 x 1 pin		5ST3 655-0HG		0.003	5ST3 655-0HG		0.003

1) Used with appropriate pole supplementary protector + 1 auxiliary switch (AS) or 1 fault signal contact (FC).

2) Always cover all exposed terminals with touch protection covers 5ST3655-0HG.

3) Maximum 100 A for infeed at the start of a busbar.

Technical Data

		5ST3 7...-0HG	5ST3 7...-2HG	5ST3 770-0HG	5ST3 770-1HG
Standards		UL 508, CSA C22.2 No. 14-M 95,			
Certifications		UL 508 File No. E328403 CSA			
Operational voltage					
• IEC	V AC	690			
• UL 508	V AC	600			
Rated current	A	-	-	115	
Maximum busbar current I_g per phase					
• Infeed at the start of the busbar	A	80	100	-	-
• Infeed at the center of the busbar	A	160	200	-	-
Busbar cross-section	mm ² Cu	18	25	-	-
Conductor cross-sections					
	AWG	-	-	10-1/0	14-1
	mm ²	-	-	6-35	1.5-50
Terminals - terminal tightening torque					
	Nm	-	-	5	3.5
	lbs/in	-	-	50	35

Control Circuit Protection

Supplementary Protection Accessories

Accessories for 5SY and 5SP supplementary protectors

Technical Data






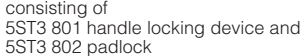

Busbar system ¹⁾

- Acc. to DIN 57 606 and DIN 57 659
- Load for one-side/central infeed:
80 A/130 A for 16 mm²

- Pin-type connections
- Single and multi-phase
- Cu: 16 mm² and fully insulated
- Lug spacing: 18 mm

- No additional connection terminal required for stranded connections up to 35 mm²
- Excellent accessibility of the feeder cables
- Busbars do not comply with UL1077

Selection and ordering data

	Length mm	Order No.	List Price \$ 1 item	Price group	Weight 1 item kg
Accessories for 5SY4, 5SY5 miniature circuit-breakers					
	Busbars 16mm²				
	Fully insulated (Do not cut):				
	1-phase	214	5ST3 700		0.040
	1-phase + AS		5ST3 702		
	2-phase		5ST3 704		0.060
	2-phase + AS		5ST3 706		
	3-phase		5ST3 708		0.100
	3-phase + AS		5ST3 711		
	3 × (1-phase + AS)		5ST3 713		
	4-phase		5ST3 715		0.150
	Without end caps (Can be cut):				
	1-phase	1016	5ST3 701		0.190
	1-phase + AS		5ST3 703		
	2-phase		5ST3 705		0.290
	2-phase + AS		5ST3 707		
	3-phase		5ST3 710		0.430
	3-phase + AS		5ST3 712		
	3 × (1-phase + AS)		5ST3 714		
	4-phase		5ST3 716		0.700
	End caps				
	for lateral insulation of cut-to-length busbars				
	1- phase		5ST3 748		0.001
	2- and 3-phase		5ST3 750		0.001
	4-phase		5ST3 718		0.001
Accessories for 5SY4, 5SY5, 5SP4 supplementary protectors					
	Handle locking device				
	applicable with all types of poles; sealable against unintended on- and off-switching; padlock with a shackle of max. 3 mm				
	Terminal cover				
	applicable with all types of poles; as an additional cover for screw openings; prevents removal of the device from the standard mounting rail; sealable				
	Padlock				
	for handle locking device 5ST3 801				
	Locking mechanism				
	consisting of 5ST3 801 handle locking device and 5ST3 802 padlock				
	Inscription labels (white) for 5SY4, 5SY5, 5SP4 miniature circuit-breakers				
	15 × 9 mm, 3 frames containing 44 labels each, attachable to the lower casing collar				
			• Self-adhesive		

1) Not UL/CSA Rated.

Control Circuit Protection

Supplementary Protection

5SY and 5SP supplementary protectors

Technical data

		5SY4	5SY6	5SY5	5SP4
Standards		EN60898 EN 60947-2 UL 1077; CSA C22.2 No. 235	EN60898 EN 60947-2 UL 1077; CSA C22.2 No. 235	EN60898 EN 60947-2	EN60898 EN 60947-2 UL 1077; CSA C22.2 No. 235
Certifications		cE; cURus, UL File No. E116386	cE; cURus, UL File No. E116386	Not UL/CSA Rated	cE; cURus, UL File No. E106582
Tripping characteristic		A, B, C, D	B, C	B, C	B, C, D
Number of poles		1, 1+N, 2, 3, 3+N, 4	1, 1+N, 2, 3, 3+N, 4	1, 2	1, 2, 3, 4
Operating voltage – EN 60898, EN 60947-2 – UL 1077 and CSA 22.2 No. 235	Min. V AC/DC	24	24	24	24
	Max. V DC/pole	60 ¹⁾	60 ¹⁾	250	60 ¹⁾
	Max. V AC	400	400	400	400
	Max. V AC V DC/pole	480Y/277 —	480Y/277	—	480Y/277
Interrupting rating					
– I _{cn} to IEC/EN 60898-1 – I _{cn} to IEC/EN 60898-2 – UL 1077 and CSA 22.2 No. 235 AC: Max. RMS Symmetrical	kA AC	10	6	10	10
	kA AC	10	10	10	10
	120/240, 240 V: kA AC	14	14	Not UL Rated	14
	240 V: kA AC	7.5	7.5		7.5
	277 V: kA AC	5	5		5
	480 V: kA AC	5	5		5
Touch Protection to EN 50274-1		Yes			
Degree of protection to EN 60529		IP20, with connected conductors			
CFC and silicone free		Yes			
Mounting					
– Snap-on mounting		Yes			—
– Standard mounting rail and mounting		—			Yes
Device Depth	mm	70			
Terminals					
– Tunnel Terminals at both ends		—	—	—	Yes
– Combined terminals at both ends		Yes	Yes	Yes	—
– Terminal, solid, stranded or finely stranded with end sleeve	mm ²	0.75 to 25			
– Terminal tightening torque	lb. in.	22 to 26			
	Nm	2.5 to 3			
Conductor cross sections					
– Solid and stranded	mm ²	0.75 to 35			
– Finely stranded, with end sleeve	mm ²	0.75 to 25			
	AWG	14 to 4			
Calibration Base	°C	30 (EN 60898)			
Average service life, with rated load	Operations	20,000	20,000	20,000 (above 40A: 10, 000)	20,000
Ambient temperature	°C	-25 to 45, occasionally +55, max. 95% humidity			
Storage Temperature	°C	-40 to +75			
Resistance to vibration to IEC 60068-2-6	m/s ²	60 at 10 Hz to 150 Hz			

1) The operating voltage 60 V DC/pole takes into account a battery charging voltage with peak value of 72 V.

Control Circuit Protection

Supplementary Protection, General Data

Tripping characteristics and breaking capacity

Tripping characteristics

Tripping performance at an ambient temperature of 30 °C

Tripping characteristic	Standards	Thermal release Test currents:				Electromagnetic release Test currents:		
		low test current	high test current	tripping time		hold	trips at the latest at	tripping time
		I_1	I_2	$63\text{ A} \geq I_n$	$63\text{ A} \leq I_n$	I_4	I_5	t
A	IEC 60 898/EN 60 898 DIN VDE 0641 Part 11	$1.13 \times I_n$		$> 1\text{ h}$	$> 2\text{ h}$	$2 \times I_n$		$\geq 0.1\text{ s}$
			$1.45 \times I_n$	$< 1\text{ h}$	$< 2\text{ h}$		$3 \times I_n$	$< 0.1\text{ s}$
B		$1.13 \times I_n$		$> 1\text{ h}$	$> 2\text{ h}$	$3 \times I_n$		$\geq 0.1\text{ s}$
			$1.45 \times I_n$	$< 1\text{ h}$	$< 2\text{ h}$		$5 \times I_n$	$< 0.1\text{ s}$
C		$1.13 \times I_n$		$> 1\text{ h}$	$> 2\text{ h}$	$5 \times I_n$		$\geq 0.1\text{ s}$
			$1.45 \times I_n$	$< 1\text{ h}$	$< 2\text{ h}$		$10 \times I_n$	$< 0.1\text{ s}$
D		$1.13 \times I_n$		$> 1\text{ h}$	$> 2\text{ h}$	$10 \times I_n$		$\geq 0.1\text{ s}$
			$1.45 \times I_n$	$< 1\text{ h}$	$< 2\text{ h}$		$20 \times I_n$	$< 0.1\text{ s}$
(IEC 60 898: $50 \times I_n$)								

Breaking capacity

Breaking capacity ratings for UL 1077 are broken down in four main line voltages that are tested. These voltages shown in the table below.

For IEC ratings, there are special requirements with regard to the breaking capacity.

The values are standardized and determined according to the testing conditions of EN 60 898 and DIN VDE 0641 Part 11.

The most usual values are

6 000 and 10 000.

For other test conditions, other values can be specified which lie above those of EN 60 898 and DIN VDE 0641 Part 11.

An example of another standard is EN 60 947-2 or DIN VDE 0660 Part 101 for MCBs.

Interrupting Rating

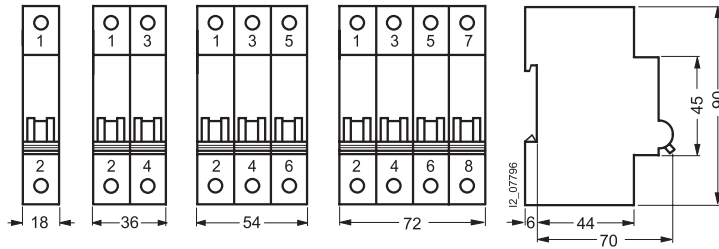
		UL 1077 1-pole 120/240 V AC (in pairs) 240 V AC		1-pole 240 V AC	1-pole 277 V AC	2-, 3-, 4-pole 480 V AC (3-phase)
Rated current	I_n [A]	I_{cn} [kA]	I_{cn} [kA]	I_{cu} [kA]	I_{cu} [kA]	I_{cu} [kA]
5SP4	80 - 125	14	7.5	5	5	5
5SY4	0.3 - 63	14	7.5	5	5	5

		UL 1077 1-pole 65 V DC	2-pole 125 V DC		
Rated current	I_n [A]	I_{cn} [A]	I_{cn} [A]		
5SP4	80 - 125	400	600		
5SY4	0.3 - 63	400	600		

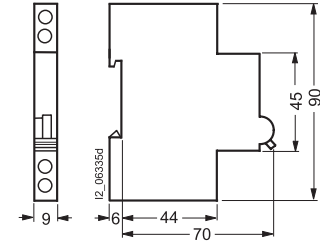
		EN 60 898 (IEC 60 898) 1-pole 230 V AC		2-, 3-, 4-pole 400 V AC	EN 60 947-2 (IEC 60 947-2) 1-pole 230 V AC	2-, 3-, 4-pole 400 V AC
Rated current	I_n [A]	I_{cn} [kA]	I_{cn} [kA]	I_{cu} [kA]	I_{cu} [kA]	I_{cu} [kA]
5SP4	80 - 125	10	10	15	15	15
5SY4	0.3 ...6	10	10	35	35	35
	8 ...32	10	10	20	20	20
	40 ...63	10	10	15	15	15

		EN 60 898-2 1-pole 230 V AC	2-pole 400 V AC	EN 60 898-2 1-pole 220 V DC	2-pole 440 V DC
Rated current	I_n [A]	I_{cn} [kA]	I_{cn} [kA]	I_{cn} [kA]	I_{cn} [kA]
5SY5	0.5 - 63	10	10	15	15

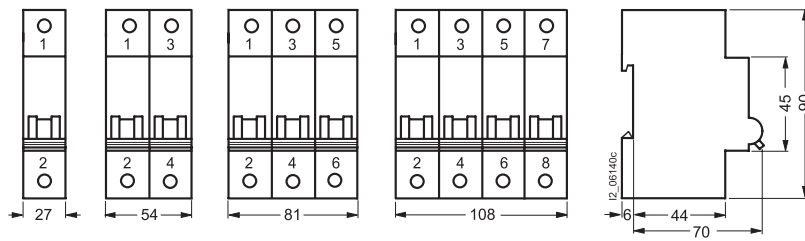
5SY4, 5SY5, 5SY6 supplementary protectors



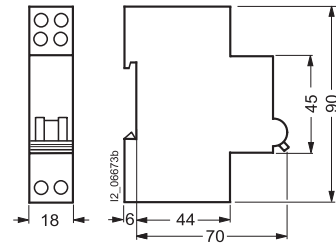
5ST3 auxiliary switch 5ST3 fault signal contact can be used with 5SY4, 5SY5, 5SY6, 5SP4



5SP4 supplementary protectors



5ST3 shunt trip 5ST3 undervoltage release can be used with 5SY4, 5SY5, 5SY6, 5SP4



Control Circuit Protection

General Data

3NW7 Cylindrical Fuse Holders

Key Common Features

- Meets a wide variety of fuse sizes
- Multi-pole configurations
- Standard 35 mm (DIN) rail mounting
- Housing material meets UL-94-V0, self-extinguishing
- Meets UL 512 and CSA C22.2, No. 39 certifications
- CE Mark
- No tools required for insertion or removal of fuses
- Finger safe design
- With or without Blown Fuse Indicator
- Draw design includes spare fuse holder

Description

Depending on the cylindrical* fuse size selected 3NW7 fuse holders are available in 1, 1 + N, 2, 3, 3 + N and 4 pole configurations. Fuse sizes include 13/32" x 1-1/2" (Class CC and Midget), 8 mm x 32 mm, 10 mm x 38 mm, 14 mm x 51 mm and 22 x 58 mm.

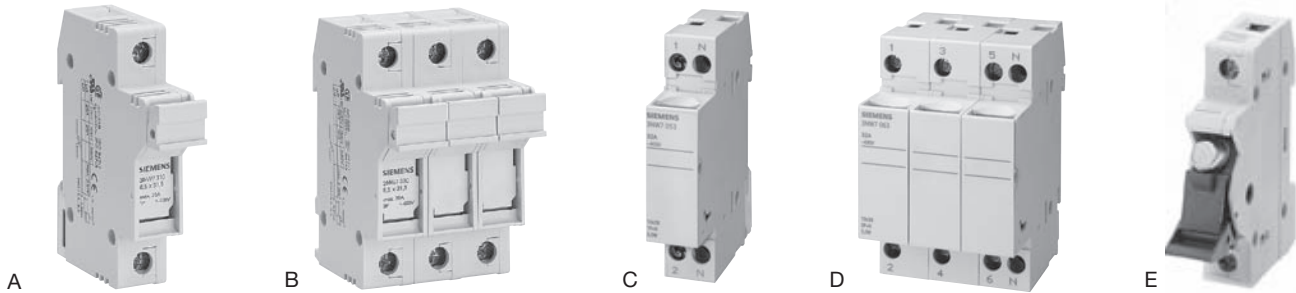
Class CC fuse holders are UL Listed for branch circuit protection according to UL 512 and CSA C22.2, No. 39. They incorporate a rejection feature that only allows Class CC fuses to be used.

Midget, 8 mm x 32 mm, 10 mm x 38 mm, 14 mm x 51 mm, and 22 x 58 mm fuse holders are UL Recognized (refer to Technical Data for specific fuse holder certifications) as supplementary protectors according to UL 512 and CSA C22.2, No. 39. Supplementary protectors are designed to provide additional protection

along with branch circuit protection devices. All fuse holders are equipped with either a fuse handle or draw mechanism for easy insertion and removal of cylindrical type fuses. During insertion and removal the fuses are isolated from the power/control circuit. Their compact size requires less space than typical open-type fuse holders and they mount directly onto standard 35 mm mounting rails.

Fuse holders for 8 mm x 32 mm, 10 mm x 38 mm fuses in the 1 + N draw design occupy the same mounting space as 1 pole designs. This unique design saves space when compared to the typical handle type fuse holder which requires two poles.

Selection and ordering data



Construction Type

Class CC Fuse Holders: UL Listed for Branch Circuit Protection³⁾

No. of Poles	In A	Fuse Size mm x mm	Without Blown Fuse Indicator				With Blown Fuse Indicator ²⁾			
			Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg	Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg
1	30	Class CC 10.3 x 38.1 (13/32" x 1-1/2")	3NW7513-0HG	—	E ¹⁾	0.056	—	—	—	—
2			3NW7523-0HG	—		0.118	—	—	—	—
3			3NW7533-0HG	—		0.172	—	—	—	—

Midget Class Fuse Holders: UL Recognized for Supplementary Protection

No. of Poles	In A	Fuse Size mm x mm	Without Blown Fuse Indicator				With Blown Fuse Indicator ²⁾			
			Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg	Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg
1	30	Midget Class 10.3 x 38.1 (13/32" x 1-1/2")	3NW7013	—	C & D ¹⁾	0.056	3NW7014	—	C & D ¹⁾	0.059
1 + N			3NW7053	—		0.069	3NW7054	—		0.072
2			3NW7023	—		0.118	3NW7024	—		0.123
3			3NW7033	—		0.172	3NW7034	—		0.180
3 + N			3NW7063	—		0.185	3NW7064	—		0.193

Other Supplementary Protectors (Refer to page 16/26 for UL and CSA status)

No. of Poles	In A	Fuse Size mm x mm	Without Blown Fuse Indicator				With Blown Fuse Indicator ²⁾			
			Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg	Order No.	List Price \$ 1 Item	Construction Type	Weight 1 Item kg
1	20	8 x 32	3NW7313	—	C	0.056	3NW7314	—	C	0.059
	32	10 x 38	3NW7013	—	C	0.056	3NW7014	—	C	0.059
	50	14 x 51	3NW7111	—	A	0.095	3NW7112	—	A	0.095
	100	22 x 58	3NW7211	—	A	0.145	3NW7212	—	A	0.145
			3NW7211	—	A	0.145	3NW7212	—	A	0.145
1 + N	20	8 x 32	3NW7353	—	C & D ¹⁾	0.069	3NW7354	—	C & D ¹⁾	0.072
	32	10 x 38	3NW7053	—	C & D ¹⁾	0.069	3NW7054	—	C & D ¹⁾	0.072
	50	14 x 51	3NW7151	—	A & B ¹⁾	0.215	3NW7152	—	A & B ¹⁾	0.215
	100	22 x 58	3NW7251	—	A & B ¹⁾	0.330	3NW7252	—	A & B ¹⁾	0.330
			3NW7251	—	A & B ¹⁾	0.330	3NW7252	—	A & B ¹⁾	0.330
2	20	8 x 32	3NW7323	—	C & D ¹⁾	0.118	3NW7324	—	C & D ¹⁾	0.123
	32	10 x 38	3NW7023	—	C & D ¹⁾	0.118	3NW7024	—	C & D ¹⁾	0.123
	50	14 x 51	3NW7121	—	A & B ¹⁾	0.195	3NW7122	—	A & B ¹⁾	0.195
	100	22 x 58	3NW7221	—	A & B ¹⁾	0.300	3NW7222	—	A & B ¹⁾	0.300
			3NW7221	—	A & B ¹⁾	0.300	3NW7222	—	A & B ¹⁾	0.300
3	20	8 x 32	3NW7333	—	C	0.172	3NW7334	—	D	0.180
	32	10 x 38	3NW7033	—	D	0.172	3NW7034	—	D	0.180
	50	14 x 51	3NW7131	—	B	0.295	3NW7132	—	B	0.295
	100	22 x 58	3NW7231	—	B	0.691	3NW7232	—	B	0.480
			3NW7231	—	B	0.691	3NW7232	—	B	0.480
3 + N	20	8 x 32	3NW7363	—	C & D ¹⁾	0.185	3NW7364	—	C & D ¹⁾	0.193
	32	10 x 38	3NW7063	—	C & D ¹⁾	0.185	3NW7064	—	C & D ¹⁾	0.193
	50	14 x 51	3NW7161	—	A & B ¹⁾	0.315	3NW7162	—	A & B ¹⁾	0.315
	100	22 x 58	3NW7261	—	A & B ¹⁾	0.475	3NW7262	—	A & B ¹⁾	0.475
			3NW7261	—	A & B ¹⁾	0.475	3NW7262	—	A & B ¹⁾	0.475

1) Same Mechanical Design - Other Pole Types Not Shown
2) LED is "ON" when fuse is blown (open)

3) UL 508 busbar available; 5ST3701-0HG, 5ST3705-0HG, 5ST3710-0HG.
See page 16/19.

Control Circuit Protection

General Data

3NW7 Cylindrical Fuse Holders

Technical data

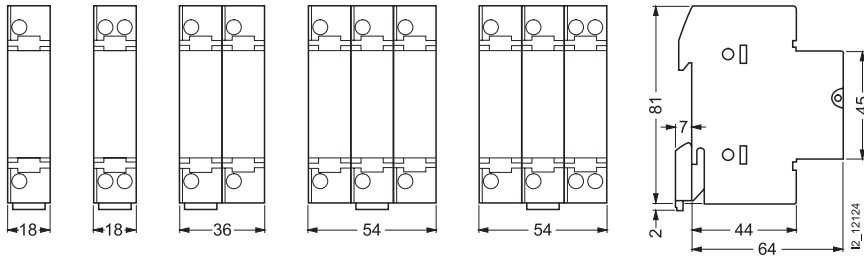
Type		Class CC 3NW75.3-0HG	Midget 3NW70.3, 3NW70.4	3NW73..	3NW70..	3NW71..	3NW72..
Fuse size	mm x mm	10.3 x 38.1	10.3 x 38.1	8 x 32	10 x 38	14 x 51	22 x 58
	inch x inch	13/32" x 1-1/2"	13/32" x 1-1/2"	-	-	-	-
Standards		UL512, CSA C22.2		IEC 60269-1, -2, -3 NF C 60-200, NF C 63-210, -211 NBN C 63269-2-1 CEI 32-4, -12		UL512, CSA C22.2	IEC 60269-1, -2, -3 NF C 60-200, NF C 63-210, -211 NBN C 63269-2-1 CEI 32-4, -12
Certifications		UL Listed, Certified to Canadian Standards	UL Recognized, Certified to Canadian Standards	Not UL / CSA Rated		UL Recognized, Certified to Canadian Standards	Not UL / CSA Rated
UL file no.		E171267		-		E171267	-
Rated voltage							
	U _n V AC	-	-	400	690		
	UL/CSA V AC	600	600	400	600		
	UL V DC	-	600 ¹⁾	-	-		
Rated current	A	30	30	20	32	50	100
Rated breaking capacity	kA	Fuse Selection Dependent		20	100		
Touch protection to BGV AC		Yes					
Degree of protection to IEC 60529		IP20, with connected conductors					
Operating temperature range		°C -5 to +40; 90% max. humidity at +20					
Conductor cross sections							
Solid	mm ²	1.5 to 25	0.5 to 10	0.5 to 10		2.5 to 10	4 to 10
Stranded	mm ²	1.5 to 25	0.5 to 10	0.5 to 10		2.5 to 25	4 to 50
Finely Stranded	mm ²	-	0.5 to 10	0.5 to 10		2.5 to 16	4 to 35
UL/CSA	AWG	18 to 4	20 to 10	-	20 to 10	6 to 10	-
Terminal Tightening Torque							
	Nm	-	-	1.2		2	2.5
	lb. in.	-	-	10.9		18.2	22.7

1) UL Recognized 600 V DC to meet the requirements of the US Solar Industry.

Dimensional drawings

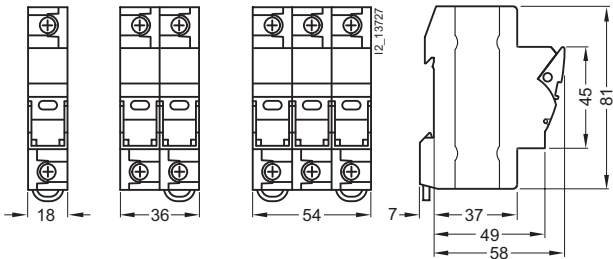
Typical Construction Type C & D

3NW73: Fuse Size 8 mm x 32 mm
3NW70: Fuse Size 10 mm x 38 mm



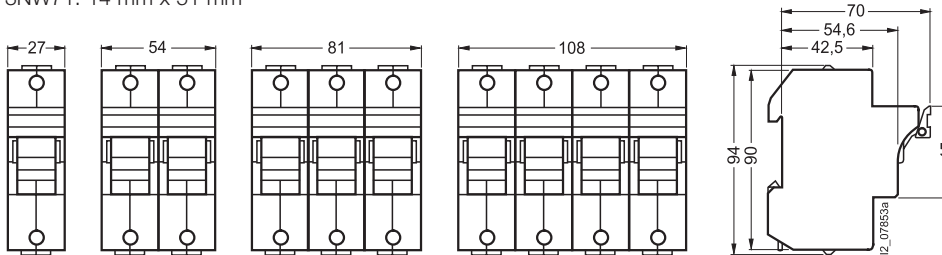
Typical Construction Type E

3NW75.3: Fuse Size 13/32" x 1-1/2", Class CC

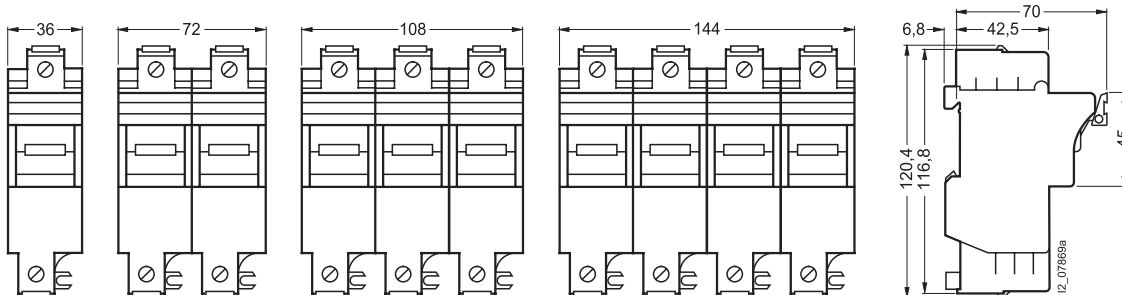


Typical Construction Type A & B

3NW71: 14 mm x 51 mm



3NW72: 22 mm x 58 mm



Control Circuit Protection

Supplementary Protection

3NC10 Open Cylindrical Fuse Holders

Features

3NC1038 open fuse holders have been certified in accordance with UL 512 and can be used with 13/32" x 1-1/2" (10 x 38 mm) fuses up to 600 V AC, 30 Amperes maximum.

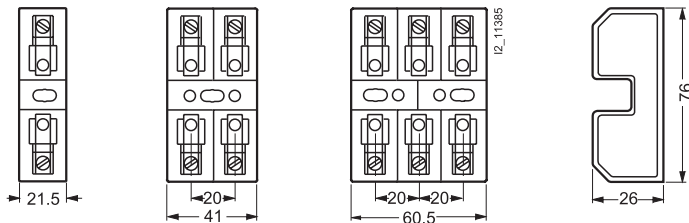
- Type M Supplementary Fuse Holder for use with 13/32" x 1-1/2" (10 x 38 mm) Fuses
- Typical Supplementary Fuses: Bussmann KTK, FNQ, FNM, BAF and BAN. Includes MIDGET Class Fuses
- Ampere Rating: 32A
- Voltage Rating: 600 V
- Withstand Rating: 10,000 RMS Symmetrical (or interrupting rating of the fuse used, whichever is lower)
- Wire Range: 18 to 4 AWG
- UL Recognized, UL 512, Fuse Holder
- UL Flammability: 94VO
- Holder Material: Thermoplastic
- Surface Mounted



Selection and ordering

Description	Number of poles	Order Number	List Price \$	Weight Item kg
Cylindrical Fuse Holder Type M, Supplementary Fuses for 13/32" x 1-1/2" (10 x 38 mm)	1	3NC1038-1		0.042
	2	3NC1038-2		0.077
	3	3NC1038-3		0.113

Dimensions



240V Circuit Breakers



BQ Breakers

Selection and ordering data

	240V
BQ	10KAIC
BQH	22KAIC
HBQ	65KAIC

1-, 2- & 3-pole up to 125A for circuit protection up to 240 volt circuits (UL)

Information	Page
General Data	17/9–17/10
Accessories	17/105–17/112



QJ Breakers

Selection and ordering data

	240V
QJ2	10KAIC
QJH-2	22KAIC
QJ2-H	42KAIC
HQJ2	65KAIC

2- & 3-pole up to 225A for circuit protection up to 240 volt circuits (UL)

Information	Page
General Data	17/11
Accessories	17/105–17/112

600/347V Circuit Breakers



CQD Breakers

Selection and ordering data

	480/277V	600/347V
CQD	14KAIC	—
CQD-6	—	10KAIC

1-, 2- & 3-pole up to 100A for circuit protection up to 600/347V (CSA) & 480/277V (UL) circuits

Information	Page
General Data	17/12
Internal Accessories	17/14
External Accessories	17/105–17/112

600/347V Circuit Breakers



GG Breakers

Selection and ordering data

	480V	600/347V
NGG	25KAIC	14KAIC
HGG	35KAIC	14KAIC
LGG	65KAIC	14KAIC

1-, 2- & 3-pole up to 125A for circuit protection up to 600/347 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/13
Internal Accessories	17/14
External Accessories	17/105–17/112

600V Circuit Breakers



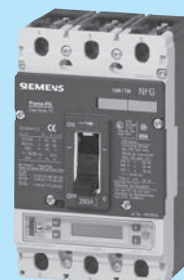
DG VL Breakers

Selection and ordering data

	480V	600Y/347V
NDG	35KAIC	18KAIC
HDG	65KAIC	18KAIC
LDG	100KAIC	18KAIC

2- & 3-pole up to 150A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
Breakers & Trip Units	17/17–17/19
Internal Accessories	17/23
External Accessories	17/43–17/57



FG VL Breakers

Selection and ordering data

	480V	600V
NFG	35KAIC	18KAIC
HFG	65KAIC	20KAIC
LFG	100KAIC	25KAIC

2- & 3-pole up to 150A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/20–17/22
Internal Accessories	17/23
External Accessories	17/43–17/57

Molded Case Circuit Breakers

600V Circuit Breakers



JG VL Breakers

Selection and ordering data

	480V	600V
NJG	35KAIC	25KAIC
HJG	65KAIC	25KAIC
LJG	100KAIC	25KAIC

2- & 3-pole up to 400A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/24-17/26
Internal Accessories	17/30
External Accessories	17/43-17/57



LG VL Breakers

Selection and ordering data

	480V	600V
NLG	35KAIC	18KAIC
HLG	65KAIC	18KAIC
LLG	100KAIC	18KAIC

2- & 3-pole up to 600A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/27-17/29
Internal Accessories	17/30
External Accessories	17/43-17/57



MG VL Breakers

Selection and ordering data

	480V	600V
NMG	35KAIC	25KAIC
HMG	65KAIC	35KAIC
LMG	100KAIC	50KAIC

2- & 3-pole up to 800A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/31-17/33
Internal Accessories	17/39
External Accessories	17/43-17/57

600V Circuit Breakers



NG VL Breakers

Selection and ordering data

	480V	600V
NNG	35KAIC	25KAIC
HNG	65KAIC	35KAIC
LNG	100KAIC	65KAIC

2- & 3-pole up to 1200A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/34-17/36
Internal Accessories	17/39
External Accessories	17/43-17/57



PG VL Breakers

Selection and ordering data

	480V	600V
NPG	35KAIC	25KAIC
HPG	65KAIC	35KAIC
LPG	100KAIC	65KAIC

2- & 3-pole up to 1600A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

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VL Circuit Breakers: Additional Information

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600V Circuit Breakers



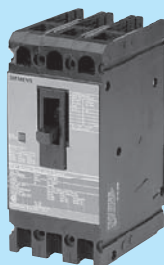
Sentron ED Breakers

Selection and ordering data

	240V	480V	600V
ED2	10KAIC	—	—
ED4	65KAIC	18KAIC	—
ED6	65KAIC	25KAIC	18KAIC

1-, 2- & 3-pole up to 125A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/63
Internal Accessories	17/65
External Accessories	17/105-17/112



Sentron HED/CED Breakers

Selection and ordering data

	480V	600V
HED4	42KAIC	—
CED6	200KAIC	100KAIC

1-, 2- & 3-pole up to 125A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

Information	Page
General Data	17/64
Internal Accessories	17/65
External Accessories	17/105-17/112



Sentron FD Breakers

Selection and ordering data

	480V	600V
FD6	35KAIC	22KAIC
HFD6	65KAIC	25KAIC
HHFD6	100KAIC	25KAIC
CFD6	200KAIC	100KAIC

2- & 3-pole up to 250A for circuit protection up to 600 volt circuits (UL/CSA/IEC)

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General Data	17/66-17/67
Internal Accessories	17/68
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600V Circuit Breakers



Sentron JD Breakers

Selection and ordering data

	240V	480V	600V
JD2	65KAIC	—	—
JD6, SJD6-A	65KAIC	35KAIC	25KAIC
HHJD6	200KAIC	100KAIC	50KAIC
CJD6, SCJD6-A	200KAIC	150KAIC	100KAIC
HJD6, SHJD6-A	100KAIC	65KAIC	35KAIC

2- & 3-pole up to 400A for circuit protection up to 600 volt circuits (UL/CSA)

Information	Page
General Data	17/69-17/71
Internal Accessories	17/72
External Accessories	17/105-17/112



Sentron LD Breakers

Selection and ordering data

	480V	600V
LD6, SLD6-A	35KAIC	25KAIC
HLD6, SHLD6-A	65KAIC	25KAIC
HHLD6	100KAIC	50KAIC
CLD6, SCLD6-A	150KAIC	100KAIC

2- & 3-pole up to 600A for circuit protection up to 600 volt circuits (UL/CSA)

Information	Page
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External Accessories	17/105-17/112



Sentron LMD Breakers

Selection and ordering data

	480V	600V
LMD6	50KAIC	25KAIC
HLMD6	65KAIC	50KAIC

2- & 3-pole up to 800A for circuit protection up to 600 volt circuits (UL/CSA)

Information	Page
General Data	17/77-17/78
Internal Accessories	17/79
External Accessories	17/105-17/112

Molded Case Circuit Breakers

600V Circuit Breakers



Sentron MD Breakers

Selection and ordering data

	480V	600V
MD, SMD6	50KAIC	25KAIC
HMD, SHMD6	65KAIC	50KAIC
CMD, SCMD6	100KAIC	65KAIC

2- & 3-pole up to 800A for circuit protection up to 600 volt circuits (UL/CSA)

Information	Page
General Data	17/80-17/82
Internal Accessories	17/86
External Accessories	17/105-17/112



Sentron ND Breakers

Selection and ordering data

	480V	600V
ND, SND6	50KAIC	25KAIC
HND, SHND6	65KAIC	50KAIC
CND, SCND6	100KAIC	65KAIC

2- & 3-pole up to 1600A for circuit protection up to 600 volt circuits (UL/CSA)

Information	Page
General Data	17/83-17/85
Internal Accessories	17/86
External Accessories	17/105-17/112



Sentron PD Breakers

Selection and ordering data

	480V	600V
PD, SPD6	50KAIC	25KAIC
HPD, SHPD6	65KAIC	50KAIC
CPD	100KAIC	65KAIC

2- & 3-pole up to 1600A for circuit protection up to 600 volt circuits (UL/CSA)

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600V Circuit Breakers



Sentron RD Breakers

Selection and ordering data

	480V	600V
RD	50KAIC	25KAIC
HRD	65KAIC	50KAIC

2- & 3-pole up to 2000A for circuit protection up to 600 volt circuits (UL/CSA)

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Sentron Circuit Breakers: Additional Information

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Ordering

In the FD through RD frames, you may order molded case circuit breakers three basic ways:

- As separately ordered frames, trip units and lugs
- As frame, trip unit and lugs ordered as one catalog number and shipped unassembled or assembled
- As Frame and Trip Unit shipped assembled and with the trip unit made non-removable, in compliance with UL 489 requirements that to be reverse fed the circuit breaker must not have an interchangeable trip unit.

These two options are described in the following:

Components Ordered Separately

To get the components for a 3-pole, 400 Amp standard interrupting circuit breaker, you would order the frame (JD63F400), the trip unit (JD63T400) and six lugs (TA2J6500). This option is normally useful only if you stock and use large volumes of product and wish to reduce your inventory cost. You may stock, for example, a smaller number of frames (JD63F400) and a variety of trip units (JD63T300, JD63T350, etc.) and assemble breakers as you need them.

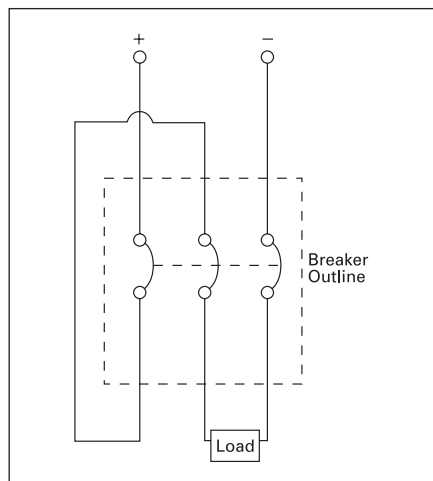
Frame, Trip Unit and Lugs Ordered Together

If you order the catalog number JD63B400, you will receive a frame, a trip unit and 6 lugs in separate packages. By suffixing this number with "L" (e.g. JD63B400L), you will receive frame, trip unit and lugs assembled in one container. Pursuant to UL 489, a product ordered thus will have the markings "LINE" and "LOAD", and may not be "reverse fed" (with power flowing from the "OFF" end of the breaker toward the "ON" end).

Non-Interchangeable Trip Breakers

If you place an "X" after the frame size designator (e.g. JXD63B400), you will receive a frame and trip unit assembled, with the trip unit made non-removable. If you suffix an "L" to this catalog number (e.g. JXD63B400L), you will receive the breaker, non-removable trip unit and lugs assembled. Unless you anticipate a specific need to change the breaker's ampere rating in the future, this is the preferred ordering method, as the products are assembled to Siemens' specifications in our factories. These breakers are suitable for use reverse fed according to UL 489, since the trip unit is not removable.

The smaller frames (QJ, ED and below) do not have removable trip units, and consequently are shipped only as assembled products. To add lugs, see the ordering instructions on each product's catalog page.



500V DC Wiring Configuration

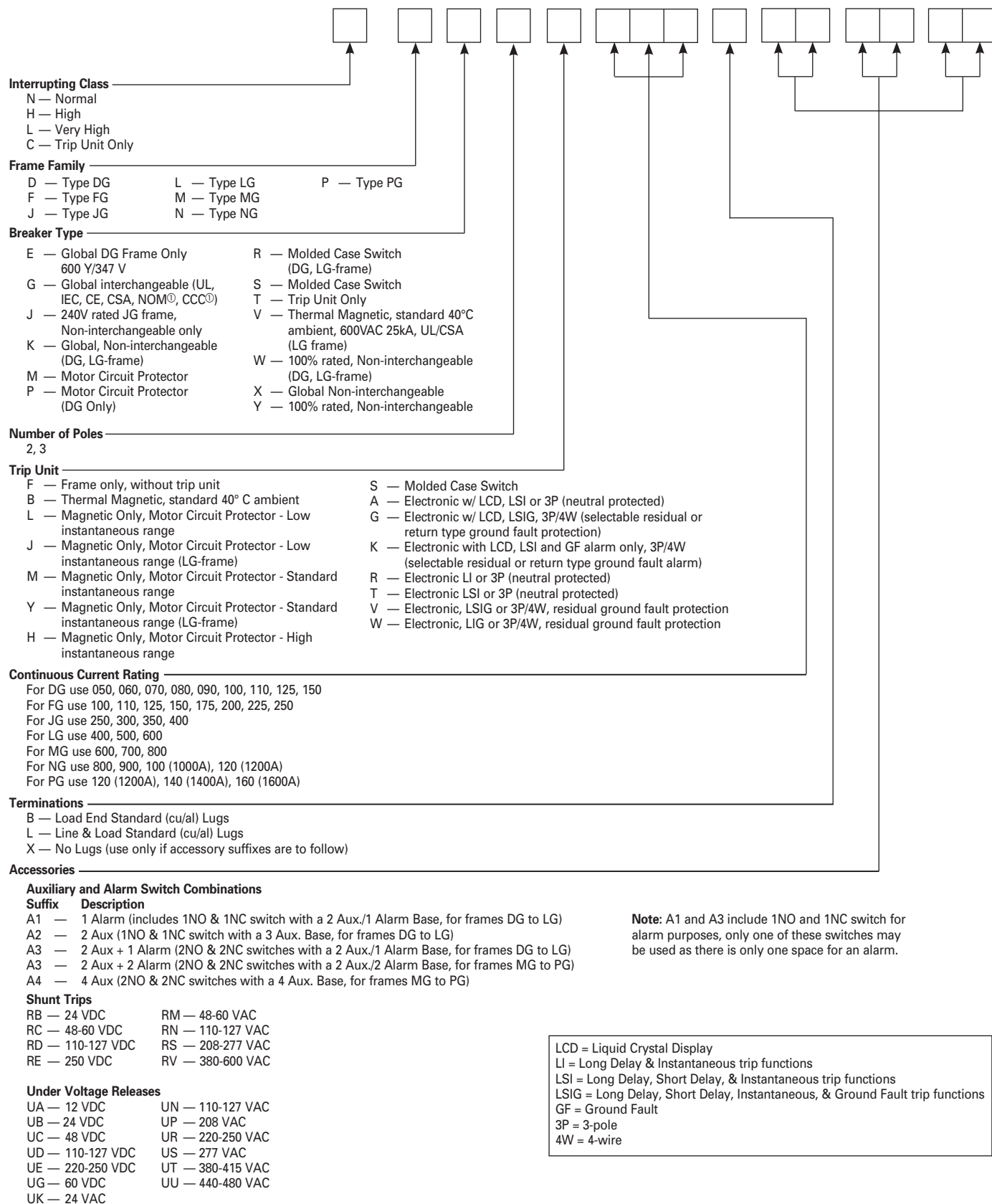
Connecting Breakers for DC Application

Most Siemens thermal magnetic trip MCCBs are applicable on direct current (dc) systems. Generally, for 250 V dc systems a two pole breaker is used, with one pole on each leg of the supply circuit. For three pole breakers applied on 500 V undergrounded DC systems, it is important to connect the power supply "zig-zag" through the breaker as shown in the figure below. This assures that the Voltage between phases on the breaker terminals is uniformly distributed.

VL Molded Case Circuit Breakers

Catalog Numbering System

Selection/Application



If ordering factory-installed accessories or special modifications, you must order a 15-digit catalog number. See the examples below for a detailed explanation. The 15 digit number is achieved by placing X's in positions not being occupied by an accessory/modification. Contact Siemens for circuit breakers configured with accessories.

Auxiliary Switch Example:

H F G 3 B 2 0 0 L	A 2	X X X X
Standard 9-digit	Aux. Switch	Completes Cat #

Shunt Trip / UVR Example:

H F G 3 B 2 0 0 L	X X	U N	X X
Standard 9-digit		UVR	
		Completes Cat #	

Shunt Trip / Auxiliary Switch Example:

H F G 3 B 2 0 0 L	A 2	R N	X X
Standard 9-digit	Aux. Switch	Shunt Trip	Completes Cat #

Non-Interchangeable Trip Breakers Example:

H F X 3 B 2 0 0 L
Standard 9-digit

General Application Molded Case Circuit Breakers

Catalog Numbering System

Selection/Application

If used on 250A frame and above means non-interchangeable trip breaker with factory assembled frame and trip. Solid state trip and current limiting (S or C in first character) are non-interchangeable only, and the "X" is omitted.

Trip Unit Type

- ☐ — Omitted — Thermal-Magnetic
- S — Sensitrip® Electronic Trip

Sentron Series Type/Interrupting Range

- ☐ — Omitted — Standard Rating
- H — High IC Rating
- HH — Extra High IC Rating
- C — Highest IC Rating and Current Limiting

Frame Identifier

- E — Type ED
- F — Type FD
- J — Type JD
- L — Type LD
- LM — Type LMD
- M — Type MD
- N — Type ND
- P — Type PD
- R — Type RD

Maximum Voltage

- 2 — 240 Vac
- 4 — 480 Vac
- 6 — 600 Vac

Number of Poles

- 1
- 2
- 3
- 9 used to indicate the max. functions for an electronic trip circuit breaker (always 3 poles)

(Specific Application Type)

- B — Standard 40°C Breaker
- M — Calibrated for 50°C Application
- F — Frame Only
- T — 40°C Trip Unit Only
- W — 50°C Trip Unit Only
- S — Molded Case Switch
- L — Low Instantaneous Range ETI Breaker
- A — Standard Range ETI Breaker
- H — High Instantaneous Range ETI Breaker

Maximum Continuous Current Rating

- ED Frame — 015, 020, 025, 030, 035, 040, 045, 050, 060, 070, 080, 090, 100, 110, 125
- FD Frame — 070, 080, 090, 100, 110, 125, 150, 175, 200, 225, 250
- JD Frame — 200, 225, 250, 300, 350, 400
- LD Frame — 250, 300, 350, 400, 450, 500, 600
- LMD Frame — 500, 600, 700, 800
- MD Frame — 500, 600, 700, 800
- ND Frame — 900, 100 (1000A), 120 (1200A)
- PD Frame — 120 (1200A), 140 (1400A), 160 (1600A)
- RD Frame — 160 (1600A), 180 (1800A), 200 (2000A)

Suffix

- L — where applicable indicates a breaker shipped with line/loads lugs installed
- A — used with a switch to show automatic self protection
- Y — 400 Hertz
- H — 100% rated
- P — Load side lugs only

NOTE:

- ☐ — Position omitted if not used.

General Application Molded Case Circuit Breakers

Lug-In/Lug-Out with INSTA-WIRE

Selection

All BQ/BQH/HBQ circuit breakers are supplied with load side lugs. If line side lugs are required, add suffix "L" to catalog number. Consult Siemens for any additional charge. All standard circuit breakers are calibrated for 40°C maximum ambient application.

Continuous Current Rating @ 40° C	Type BQ ^①	Type BQH	Type HBQ
	10,000A IR	22,000A IR	65,000A IR
	Catalog Number	Catalog Number	Catalog Number

1-Pole (120V AC)^⑤

15	BQ1B015 ^④	BQ1B015H ^④	HB1B015 ^④
20	BQ1B020 ^④	BQ1B020H ^④	HB1B020 ^④
25	BQ1B025	BQ1B025H	HB1B025
30	BQ1B030	BQ1B030H	HB1B030
35	BQ1B035	BQ1B035H	HB1B035
40	BQ1B040	BQ1B040H	HB1B040
45	BQ1B045	BQ1B045H	HB1B045
50	BQ1B050	BQ1B050H	HB1B050
60	BQ1B060	BQ1B060H	HB1B060
70	BQ1B070	BQ1B070H	HB1B070

2-Pole (Common-Trip 120/240V AC)^④

15	BQ2B015	BQ2B015H	HB2B015
20	BQ2B020	BQ2B020H	HB2B020
25	BQ2B025	BQ2B025H	HB2B025
30	BQ2B030	BQ2B030H	HB2B030
35	BQ2B035	BQ2B035H	HB2B035
40	BQ2B040	BQ2B040H	HB2B040
45	BQ2B045	BQ2B045H	HB2B045
50	BQ2B050	BQ2B050H	HB2B050
60	BQ2B060	BQ2B060H	HB2B060
70	BQ2B070	BQ2B070H	HB2B070
80	BQ2B080	BQ2B080H	HB2B080
90	BQ2B090	BQ2B090H	HB2B090
100	BQ2B100	BQ2B100H	HB2B100
110	BQ2B110	BQ2B110H	HB2B110
125	BQ2B125	BQ2B125H	HB2B125

2-Pole (Common-Trip 240V AC)^{③④}

15	BQ2H015	—	—
20	BQ2H020	—	—
30	BQ2H030	—	—
40	BQ2H040	—	—
50	BQ2H050	—	—
60	BQ2H060	—	—
70	BQ2H070	—	—
80	BQ2H080	—	—
90	BQ2H090	—	—
100	BQ2H100	—	—

3-Pole (Common-Trip 240V AC)^⑦

15	BQ3B015	BQ3B015H	HB3B015
20	BQ3B020	BQ3B020H	HB3B020
25	BQ3B025	BQ3B025H	HB3B025
30	BQ3B030	BQ3B030H	HB3B030
35	BQ3B035	BQ3B035H	HB3B035
40	BQ3B040	BQ3B040H	HB3B040
45	BQ3B045	BQ3B045H	HB3B045
50	BQ3B050	BQ3B050H	HB3B050
60	BQ3B060	BQ3B060H	HB3B060
70	BQ3B070	BQ3B070H	HB3B070
80	BQ3B080	BQ3B080H	HB3B080
90	BQ3B090	BQ3B090H	HB3B090
100	BQ3B100	BQ3B100H	HB3B100

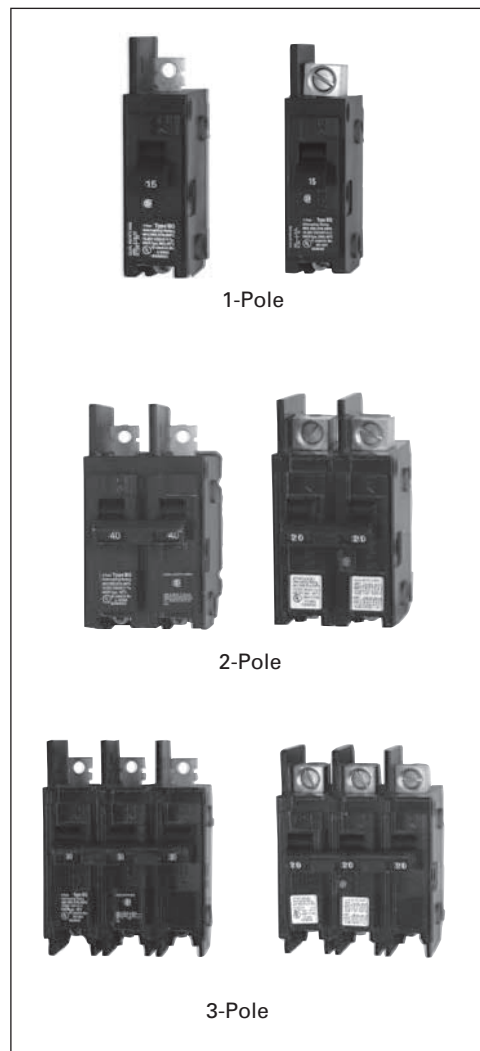
BQ / BQH / HBQ Internal Accessories

Description	Catalog Number	Field/Factory Installed
120V Shunt Trip	add suffix...00S01	Factory
24V Shunt Trip	add suffix...00S07	Factory
120V Auxiliary Switch	add suffix...01	Factory

■ Built to order. Allow 2-3 weeks for delivery
 ① UL Listed for use with 60/75° wire through 40 amps,
 UL listed for use with 75° wire only for 50 amps
 and above, HACR rated.

② 1A and 1B contacts.
 ③ UL Listed for use on 3-phase grounded "B" systems —
 10,000 for this application.
 ④ UL Listed for frequent switching
 applications (SWD). 120V AC Fluorescent Lighting.

⑤ Shipped 12 per sleeve.
 ⑥ Shipped 6 per sleeve.
 ⑦ Shipped 4 per sleeve.
 ⑧ UL Listed 5KA IR.



Factory Modifications

Description	Catalog Number
Line Side Lugs	add suffix...L
Quick Connect Lug	add suffix...QX
400Hz Calibration	add suffix...Y ^⑧
Marine 50° C Ambient Calibration	add suffix...M
Fungus Proofing	add suffix...F

For external accessories, please refer to page 17/106

General Application Molded Case Circuit Breakers

DIN Rail Mounted Circuit Breakers

Selection/Dimensions

Breaker Type	Ampere Rating	Catalog Number	Load Side Connector	Interrupting Ratings (KA) (RMS Symmetrical Amperes) Volts AC	
				120	120/240

1-Pole DIN Rail (120V AC)

BQXD 1-Pole 120V DIN Rail	10	BQ1B010QLD	TC1Q1	10	
	15	BQ1B015QLD	TC1Q1	10	
	20	BQ1B020QLD	TC1Q1	10	
	25	BQ1B025QLD	TC1Q1	10	
	30	BQ1B030QLD	TC1Q1	10	
	35	BQ1B035QLD	TC1Q1	10	
	40	BQ1B040QLD	TC1Q1	10	
	45	BQ1B045QLD	TA1Q1	10	
	50	BQ1B050QLD	TA1Q1	10	
	60	BQ1B060QLD	TA1Q1	10	
	10	BQ1B010QXD	Quick-Connect	10	
	15	BQ1B015QXD	Quick-Connect	10	
	20	BQ1B020QXD	Quick-Connect	10	
	25	BQ1B025QXD	Quick-Connect	10	
	30	BQ1B030QXD	Quick-Connect	10	
	35	BQ1B035QXD	Quick-Connect	10	
	40	BQ1B040QXD	Quick-Connect	10	
	45	BQ1B045QXD	Quick-Connect	10	
	50	BQ1B050QXD	Quick-Connect	10	
	60	BQ1B060QXD	Quick-Connect	10	

2-Pole DIN Rail (120/240V AC)

BQXD 2-Pole 120/240V DIN Rail	10	BQ2B010QLD	TC1Q1		10
	15	BQ2B015QLD	TC1Q1		10
	20	BQ2B020QLD	TC1Q1		10
	25	BQ2B025QLD	TC1Q1		10
	30	BQ2B030QLD	TC1Q1		10
	35	BQ2B035QLD	TC1Q1		10
	40	BQ2B040QLD	TC1Q1		10
	45	BQ2B045QLD	TA1Q1		10
	50	BQ2B050QLD	TA1Q1		10
	60	BQ2B060QLD	TA1Q1		10
	10	BQ2B010QXD	Quick-Connect		10
	15	BQ2B015QXD	Quick-Connect		10
	20	BQ2B020QXD	Quick-Connect		10
	25	BQ2B025QXD	Quick-Connect		10
	30	BQ2B030QXD	Quick-Connect		10
	35	BQ2B035QXD	Quick-Connect		10
	40	BQ2B040QXD	Quick-Connect		10
	45	BQ2B045QXD	Quick-Connect		10
	50	BQ2B050QXD	Quick-Connect		10
	60	BQ2B060QXD	Quick-Connect		10

Lugs-For Use with BQ, BQH, HBQ^④

Circuit Breaker Amp. Rtg.	Cab. Per Lug	Lug Wire Range AWG	Catalog Number
Line Side			
10-40	1	#16-#6 Cu #12-#6 Al	TC1Q1 ^②
45-125	1	#8-#1 Cu #6-#1/0 Al	TA1Q1
Load Side			
10	2	#16 Cu	Connectors are Supplied with Circuit Breaker
15-20	1	#14-#10 Cu #12-#10 Al	
25-35	1	#14-#6 Cu #12-#10 Al	
40-50	1	#8-#6 Cu #8-#4 Al	
55-70	1	#8-#4 Cu #8-#2 Al	
80-100	1	#4-#1/0 Cu #2-#1/0 Al	
110-125	1	#2-#1/0 Cu #1/0-#2/0 Al	

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2-3 weeks for delivery.

① UL Listed for use with 60/75° wire through 40 amps, UL listed for use with 75° wire only for 50 amps and above, HACR rated.

Finger Safe Terminal Shield

Protects against accidental contact with lugs—1 per lug. Fits line and load end.

Catalog Number	Qty
BQFS2	2
BQFS1K	1000

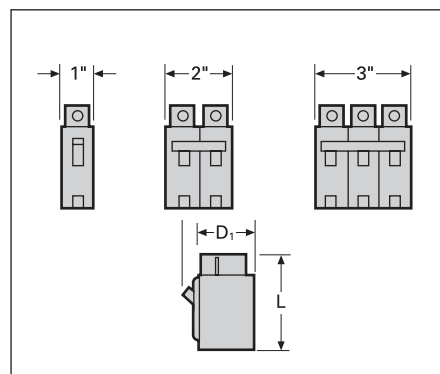
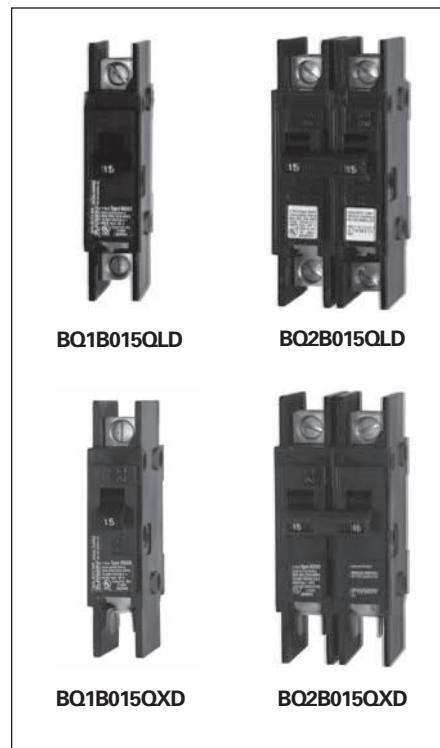
Enclosures	
Type	Catalog Number ^④
1	EB3100S ^⑤
3R	WB3100

② Connector has steel construction.

③ Surface mounted indoor. If flush mounting is required, replace suffix "S" in catalog number with suffix "F".

④ Neutral included in enclosure.

⑤ Enclosure will not accept circuit breakers with shunt trips or auxiliary switches installed.



Breaker Type	Amperes	Dimensions (inches)		
		L	D1	D2
BQ, BQH	15-50	3 3/4	2 3/4	3
BQ, BQH	55-125	4	2 3/4	3
HBQ	15-125	4	2 3/4	3
BQXD	15-60	4 1/2	2 3/4	3

⑥ Type BQXD uses TA1Q1 or TC1Q1 lugs on line side of circuit breaker.

For external accessories, please refer to pages 17/106, 17/108 to 17/113

• Revised •
10/18/15

General Application Molded Case Circuit Breakers

QJ 225A Frame

Selection/Dimensions

Continuous Current Rating @ 40°C	2-Pole 240V AC Catalog Number	3-Pole 240V AC Catalog Number
----------------------------------	-------------------------------	-------------------------------

Type QR2^②

100	QR22B100	QR23B100
125	QR22B125	QR23B125
150	QR22B150	QR23B150
175	QR22B175	QR23B175
200	QR22B200	QR23B200
225	QR22B225	QR23B225
250	QR22B250	QR23B250

Type QRH2^②

100	QRH22B100■	QRH23B100
125	QRH22B125	QRH23B125
150	QRH22B150	QRH23B150
175	QRH22B175■	QRH23B175
200	QRH22B200	QRH23B200
225	QRH22B225	QRH23B225
250	QRH22B250	QRH23B250

Type HQR2^②

100	HQR22B100■	HQR23B100
125	HQR22B125	HQR23B125
150	HQR22B150	HQR23B150
175	HQR22B175■	HQR23B175
200	HQR22B200	HQR23B200
225	HQR22B225	HQR23B225
250	HQR22B250	HQR23B250

Type HQR2H^②

100	HQR22B100H	HQR23B100H▲
125	HQR22B125H	HQR23B125H▲
150	HQR22B150H	HQR23B150H▲
175	HQR22B175H	HQR23B175H▲
200	HQR22B200H	HQR23B200H▲
225	HQR22B225H	HQR23B225H▲
250	HQR22B250H	HQR23B250H▲

Ordering Information

Load side 3TA1QR300 lugs are mounted and included when circuit breaker is ordered. For line and load lugs (3TA1QR300) installed at no additional charge, add suffix "L" to catalog number.

50°C Calibration - See page 7-91.

400HZ. - See page 7-91.

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
2	1	3
3	1	4

Lugs For 75°C Wire^①

Catalog Number	Lug Body	Lug Wire Range
3TA1QR300	Al	#3 - 1/0 Al/Cu 2/0 AWG - 300 Kcmil
3TA1QR250	Cu	#3 - 1/0 Cu ONLY 2/0 AWG - 300 Kcmil Cu ONLY

Enclosures (Neutral Included)

Type	Catalog Number
1	QR2N1
3R	QR2N3R3
12	QR2N12
4X	QR2N4X
4X316	QR2N4X316

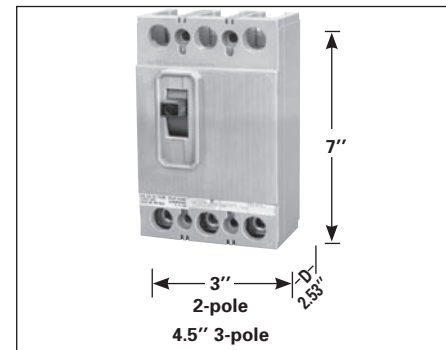
UL 489 Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (kA) Volts AC (50/60 Hz)
QR2	240
QRH2	10
HQR2	25
HQR2H	65
	100

Internal Accessories

Add suffix to catalog number.

Control Voltage		Shunt Trip	Auxiliary Switches		Shunt Trip and 1A and 1B Auxiliary Switch
AC	DC		1A and 1B	2A and 2B	
		Suffix	Suffix	Suffix	Suffix
120/240	48	00S01■	A01■	A02■	01S01■
	24	00S07■	A01■	A02■	01S07■



■ Built to order. Allow 2-3 weeks for delivery.

▲ Built to order. Allow 6-8 weeks for delivery.

① See Note: A page 17/42.

Note: QJ breakers are UL Listed for reverse feed applications.

② HACR rated.

③ Internal accessories are not available on 2-pole QJ breakers.

For external accessories, please refer to pages 17/108 to 17/113

General Application Molded Case Circuit Breakers

CQD 100A Frame

Selection/Dimensions

Type CQD (Cable In - Cable Out) DIN Rail Mount^③

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	277V AC 125V DC	480Y/277V AC 125/250V DC	480Y/277V AC
	Catalog Number	Catalog Number	Catalog Number
15	CQD115 ^{①②}	CQD215 ^②	CQD315 ^②
20	CQD120 ^{①②}	CQD220 ^②	CQD320 ^②
25	CQD125 ^②	CQD225 ^②	CQD325 ^②
30	CQD130 ^②	CQD230 ^②	CQD330 ^②
35	CQD135 ^②	CQD235 ^②	CQD335 ^②
40	CQD140 ^②	CQD240 ^②	CQD340 ^②
45	CQD145 ^②	CQD245 ^②	CQD345 ^②
50	CQD150 ^②	CQD250 ^②	CQD350 ^②
60	CQD160 [■]	CQD260	CQD360
70	CQD170 [■]	CQD270	CQD370
80	CQD180 [■]	CQD280	CQD380
90	CQD190 [■]	CQD290 [■]	CQD390
100	CQD1100 [■]	CQD2100	CQD3100

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight lbs. (kg)
1	1	0.5 (0)
2	1	1.0 (0)
3	1	1.5 (1)

Lugs For 60/75°C Wire

Amps	Wire Size
15–40	#14–#6 AWG Cu #12–#6 AWG Al
45–100	#8–#1 AWG Cu #6–#1/0 AWG Al



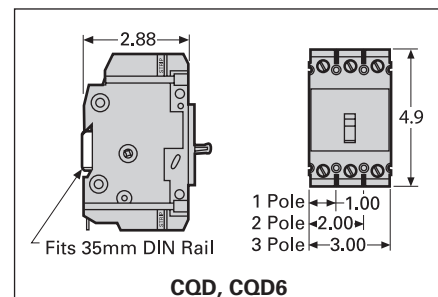
CQD, CQD6

Type CQD6 (Cable In - Cable Out) CSA Certified, not UL

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	347V AC 125V DC	600Y/347V AC 125/250V DC	600Y/347V AC
	Catalog Number	Catalog Number	Catalog Number
15	—	CQD6215 [■]	CQD6315 [■]
20	CQD6120 ^②	CQD6220 [■]	CQD6320 [■]
25	CQD6125 ^②	CQD6225 [■]	CQD6325 [■]
30	CQD6130 ^②	CQD6230 [■]	CQD6330 [■]
35	CQD6135 [■]	CQD6235 [■]	CQD6335 [■]
40	CQD6140 [■]	CQD6240 [■]	CQD6340 [■]
45	CQD6145 [■]	CQD6245 [■]	CQD6345 [■]
50	CQD6150 [■]	CQD6250 [■]	CQD6350 [■]
60	CQD6160 [■]	CQD6260 [■]	CQD6360 [■]
70	CQD6170 [■]	CQD6270 [■]	—

Interrupting Ratings

Breaker Type	Number of Poles	RMS Symmetrical Amperes (KA)						
		Volts AC (50/60 Hz)					Volts DC	
		120	240	277	480/277	600/347	125	125/250
CQD (UL)	1	65	—	14	—	—	14	—
	2	—	65	—	14	—	—	14
	3	—	65	—	14	—	—	—
CQD6 (CSA)	1	65	—	14	—	10	14	—
	2	—	65	—	—	10	—	14
	3	—	65	—	—	10	—	—



For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2–3 weeks for delivery.

② HID rated.

① SWD rated.

③ HACR rated.

Note: CQD breakers are UL Listed for reverse feed applications.

Accessories pages 17/14 and 17/108 to 17/113

General Application Molded Case Circuit Breakers

GG 125A Frame

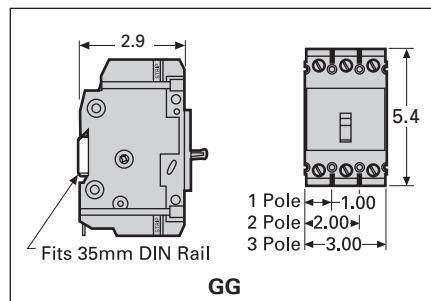
Selection/Dimensions

GG 125A Frame (Cable In - Cable Out)

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	Catalog Number	Catalog Number	Catalog Number
15	NGG1B015L ^{①②}	NGG2B015L ^②	NGG3B015L ^②
20	NGG1B020L ^{①②}	NGG2B020L ^②	NGG3B020L ^②
25	NGG1B025L ^②	NGG2B025L ^②	NGG3B025L ^②
30	NGG1B030L ^②	NGG2B030L ^②	NGG3B030L ^②
35	NGG1B035L ^②	NGG2B035L ^②	NGG3B035L ^②
40	NGG1B040L ^②	NGG2B040L ^②	NGG3B040L ^②
45	NGG1B045L ^②	NGG2B045L ^②	NGG3B045L ^②
50	NGG1B050L ^②	NGG2B050L ^②	NGG3B050L ^②
60	NGG1B060L	NGG2B060L	NGG3B060L
70	NGG1B070L	NGG2B070L	NGG3B070L
80	NGG1B080L	NGG2B080L	NGG3B080L
90	NGG1B090L	NGG2B090L	NGG3B090L
100	NGG1B100L	NGG2B100L	NGG3B100L
110	NGG1B110L	NGG2B110L	NGG3B110L
125	NGG1B125L	NGG2B125L	NGG3B125L

Line and load lugs are included as standard. If no lugs are required, remove the "L" suffix. HACR rated.

Suitable for screws or DIN rail mounting.



Type HGG (Cable In - Cable Out)

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	Catalog Number	Catalog Number	Catalog Number
15	HGG1B015L ^{①②}	HGG2B015L ^②	HGG3B015L ^②
20	HGG1B020L ^{①②}	HGG2B020L ^②	HGG3B020L ^②
25	HGG1B025L ^②	HGG2B025L ^②	HGG3B025L ^②
30	HGG1B030L ^②	HGG2B030L ^②	HGG3B030L ^②
35	HGG1B035L ^②	HGG2B035L ^②	HGG3B035L ^②
40	HGG1B040L ^②	HGG2B040L ^②	HGG3B040L ^②
45	HGG1B045L ^②	HGG2B045L ^②	HGG3B045L ^②
50	HGG1B050L ^②	HGG2B050L ^②	HGG3B050L ^②
60	HGG1B060L	HGG2B060L	HGG3B060L
70	HGG1B070L	HGG2B070L	HGG3B070L
80	HGG1B080L	HGG2B080L	HGG3B080L
90	HGG1B090L	HGG2B090L	HGG3B090L
100	HGG1B100L	HGG2B100L	HGG3B100L
110	HGG1B110L	HGG2B110L	HGG3B110L
125	HGG1B125L	HGG2B125L	HGG3B125L

Type LGG (Cable In - Cable Out)

Continuous Current Rating @ 40°C	1-Pole	2-Pole	3-Pole
	Catalog Number	Catalog Number	Catalog Number
15	LGG1B015L ^{①②}	LGG2B015L ^②	LGG3B015L ^②
20	LGG1B020L ^{①②}	LGG2B020L ^②	LGG3B020L ^②
25	LGG1B025L ^②	LGG2B025L ^②	LGG3B025L ^②
30	LGG1B030L ^②	LGG2B030L ^②	LGG3B030L ^②
35	LGG1B035L ^②	LGG2B035L ^②	LGG3B035L ^②
40	LGG1B040L ^②	LGG2B040L ^②	LGG3B040L ^②
45	LGG1B045L ^②	LGG2B045L ^②	LGG3B045L ^②
50	LGG1B050L ^②	LGG2B050L ^②	LGG3B050L ^②
60	LGG1B060L	LGG2B060L	LGG3B060L
70	LGG1B070L	LGG2B070L	LGG3B070L
80	LGG1B080L	LGG2B080L	LGG3B080L
90	LGG1B090L	LGG2B090L	LGG3B090L
100	LGG1B100L	LGG2B100L	LGG3B100L
110	LGG1B110L	LGG2B110L	LGG3B110L
125	LGG1B125L	LGG2B125L	LGG3B125L

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight lbs. (kg)
1	1	.75 (0.34)
2	1	1.3 (0.59)
3	1	2.0 (0.98)

Lugs For 60/75°C Wire

NGG		
Ampere Rating	Wire Size	Catalog Number
15-30A	#14-#6 AWG Cu	TC1Q1 (qty. 1)
	#12-#6 AWG Al	3TC1Q1 (qty. 3)
35-125A	#8-1/0 AWG Cu #8-2/0 AWG Al	3TC1GG20 (qty. 3)
15-125A	Nut Keeper plate w/ screw (for crimp terminals)	TNKG3 (qty. 3)

Interrupting Ratings (max. RMS symmetrical amperes kA)

Breaker Type	Poles	UL489							IEC 60947-2 (Ics = 50%Icu)			
		Volts AC							Volts AC		Volts DC	
		120	240	277	347	480	600Y/347	125	125/250	240	415	125/250
NGG	1	65	—	25	14	—	—	14	—	25	—	—
	2,3	—	65	—	—	25	14	—	14 ^①	65	—	14
HGG	1	65	—	35	14	—	—	14	—	—	—	—
	2,3	—	65	—	—	35	14	—	14 ^①	—	—	14
LGG	1	65	—	65	14	—	—	14	—	—	—	—
	2,3	—	65	—	—	65	14	—	14 ^①	—	—	14

For inches / millimeters conversion, see Application Data section.

① SWD rated.

② HID rated at 15-50A 1-pole @ 277 VAC; 2 & 3-pole @ 480 VAC

Accessories pages 17/14 and 17/108 to 17/113

General Application Molded Case Circuit Breakers

Accessories^①

Selection

Shunt Trip

Control Voltage		BQD, BQD6, CQD, CQD6, NGG, HGG, LGG, NGB, HGB and LGB
V AC	V DC	Catalog Number
120	—	CQDST120
240	—	CQDST240▲
277	—	CQDST277▲
480	—	CQDST480▲
600	—	CQDST600
—	12	CQDST12
—	24	CQDST24
—	48	CQDST48
—	125	CQDST125

Auxiliary Switch

Maximum Voltage		Number of Contacts	BQD, BQD6, CQD, CQD6, NGG, HGG, LGG, NGB, HGB and LGB Catalog Number
AC	DC		
240	125	1A-1B	CQDA1
240	125	2A-2B	CQDA2

Alarm Switch

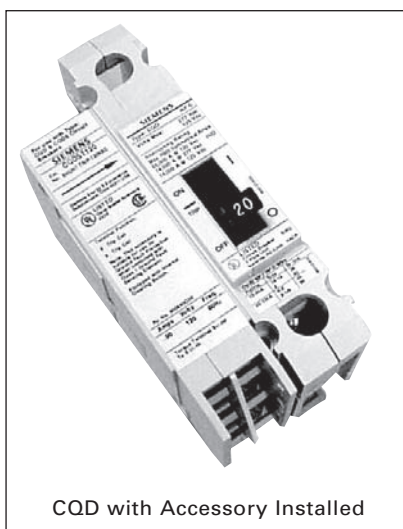
Maximum Voltage		BQD, BQD6, CQD, CQD6, NGG, HGG, LGG, NGB, HGB and LGB
AC	DC	Catalog Number
240	125	CQDBA

Shunt Trip and Auxiliary Switch Combinations

Shunt Trip Voltage		BQD, BQD6, CQD, CQD6, NGG, HGG, LGG, NGB, HGB and LGB
AC	DC	Catalog Number
24	—	CQDST24AAS▲
120	—	CQDST120AAS▲
240	—	CQDST240AAS▲
277	—	CQDST277AAS▲
480	—	CQDST480AAS▲
600	—	CQDST600AAS▲
—	12	CQDST12DAS▲
—	24	CQDST24DAS▲
—	48	CQDST48DAS▲
—	125	CQDST125DAS▲

Alarm and Auxiliary Switch Combinations

For Breaker	Catalog Number
BQD, BQD6, CQD, CQD6, NGG, HGG, LGG, NGB, HGB and LGB	CQDA1BA▲



CQD with Accessory Installed

▲ Built to order. Allow 6-8 weeks for delivery.

① Adds 1-pole space for accessory.

The interchangeability of the VL circuit breaker trip units allow for easy conversion from any of 3 types of protection. They are thermal-magnetic, electronic, or electronic with a built-in LCD. The thermal-magnetic trip unit features an adjustable magnetic trip setting. The electronic trip units are microprocessor based true RMS sensing devices and are available with a variety of adjustable trip settings, configurations, and information

menus. With precise control over the circuit breaker functions and access to system status, diagnostics, and information, these trip units allow for unsurpassed flexibility in circuit coordination.

An example of coordination is the out of the box Ground Fault function on the Model 555 trip units. The pick-up and time delay settings are set at the

factory for each frame and do not overlap with the settings on the other frames. Therefore, when VL breakers are used together in a system the GF protection is automatically coordinated. The user also has the ability to program a custom coordination scheme with adjustable settings on both the 555 and 586 trip units.

Trip Unit Functions	VL Trip Units							
	Model 525	Model 555				Model 586		
	Thermal-magnetic	Electronic LI	Electronic LIG	Electronic LSI	Electronic LSIG	Electronic with LCD LSI	Electronic with LCD LSIG	Electronic with LCD LSI + G alarm only
Continuous Current Setting (I_r)	Fixed	◆	◆	◆	◆	◆	◆	◆
Long Time Delay (t_r)	□	◆	◆	◆	◆	◆	◆	◆
Instantaneous Function	●	●	●	●	●	(ON/OFF)	(ON/OFF)	(ON/OFF)
Instantaneous Pickup (I_i)	◆	◆	◆	◆	◆	◆	◆	◆
Short Time Function	□	□	□	●	●	(ON/OFF)	(ON/OFF)	(ON/OFF)
Short Time Pick-up (I_{sd})	□	□	□	◆	◆	◆	◆	◆
Short Time Delay (t_{sd})	□	□	□	◆	◆	◆	◆	◆
Ground Fault Pick-up (I_g)	□	□	◆	□	◆	□	◆	□
Ground Fault Delay (t_g)	□	□	◆	□	◆	□	◆	□
Ground Fault Alarm Pick-up	□	□	□	□	□	□	◆	◆
Ground Fault Alarm Delay	□	□	□	□	□	□	◆	◆
Alarm & Status Indicator	□	●	●	●	●	●	●	●
Built-in Display (LCD)	□	□	□	□	□	●	●	●
Pre-Trip Alarm ^①	□	●	●	●	●	●	●	●
Last Trip Information	□	● ^①	● ^①	● ^①	● ^①	●	●	●
Zone Selective ^①	□	●	●	●	●	●	●	●
Communications ^①	□	●	●	●	●	●	●	●

◆ Adjustable setting
 ● This feature is included
 □ Feature is not included.
 ① Requires a COMPRO20 or COMM021 module in a communication system.

Continuous Amps Rating (I_r)

This setting is the continuous current that the breaker will carry without tripping. It can be set up to 100% of the trip unit's nominal rating (I_n).

Long Time Delay (t_r)

Sometimes referred to as the "overload" position, this function controls the breaker's "pause-in-tripping" time. It allows low level, temporary inrush currents such as those encountered when starting a motor to pass without tripping. The time delay begins when the current reaches $6 \times I_r$.

Instantaneous Pick-up (I_i)

This function sets the breaker to trip instantaneously during high fault conditions. This function may be turned off on Model 586 trip units. Turning this function off will enable an instantaneous trip

override function to ensure self protection of circuit breaker.

Short Time Pick-Up (I_{sd})

This function controls the level of fault current the breaker will carry for a short time without tripping, thus allowing downstream devices to clear short circuits ahead of up-stream protection. It may be defeated (turned-off) on Model 586 trip units.

Short Time Delay (t_{sd})

This controls the interval of time the breaker will remain closed against a fault (at the Short Time Pick-up current level) without tripping. The time delay may be set at fixed points or at short time intervals based on I^2t curves. This function is used with the Short Time Pick-up to achieve selectivity and better system coordination.

Ground Fault Pick-Up (I_g)

This setting controls the level of ground fault current that will cause the breaker to trip. Model 555 Electronic Trip Units act on the residual current to sense ground current. The Model 586 Electronic Trip Unit is programmable and allows the user to select either the residual current method or direct detection (via a separate current transformer) to detect ground current.

Ground Fault Time Delay (t_g)

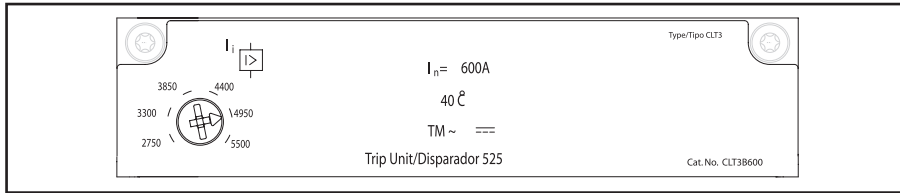
This controls the interval of time the breaker will remain closed after a ground fault is detected (at the Ground Fault Pick-up current level) without tripping.

VL Molded Case Circuit Breakers

General Information

Selection

Thermal-Magnetic trip units, Model 525, combine the inverse time element design for low level overloads, and instantaneous magnetic action for short circuit protection. The standard unit has preset overload protection and an adjustable instantaneous trip setting, with 6 set points. Thermal-Magnetic trip units are available throughout the VL family, from 50 to 1600A.



Electronic Trip Units

Electronic trip units are available through the VL family, from 60A (which can be set as low as 30A) up through 1600A. They are also available in four trip configurations (LI, LIG, LSI, LSIG) and features can include a built-in LCD display.

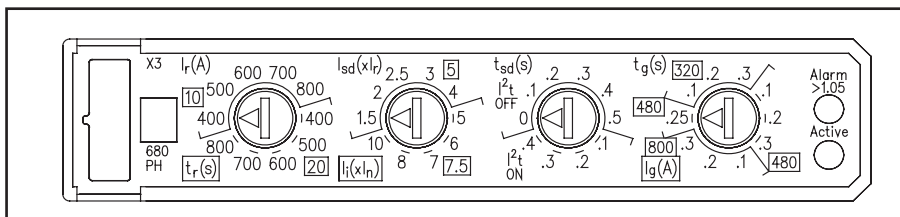
microprocessor is in operating and another indicates an overload condition. For ease-of-use and to insure proper coordination, the set points for the continuous current are shown on the face of these trip units in amps.

On the Model 555 Electronic Trip Unit a flashing LED confirms that the

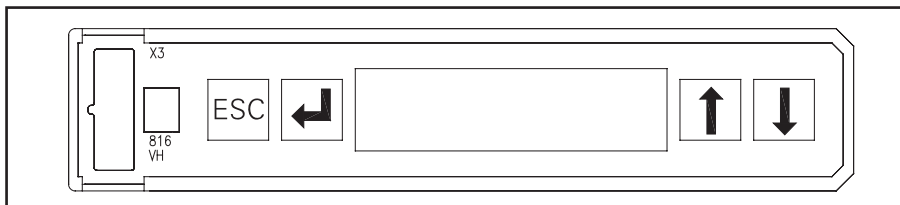
On the Model 586, the LCD version, the current in each phase is continuously shown on the display. Unlike many

displays, no secondary or auxiliary voltage is required as long as the breaker is energized and a minimal load current is present. These trip units can also indicate the "last trip" status (date, time, amps) when they're connected to a PC via one of our communications modules. Without being connected via a communication module, the last trip status can be viewed on Model 586 trip units (no time stamp).

Typical Trip Unit Labeling and Adjustment Positions



Model 555 Electronic Trip Unit with LSIG trip functions



Model 586 Electronic Trip Unit has an LCD display

VL Molded Case Circuit Breakers

DG 150A Frame, VL Series

Selection

Ordering Information

Complete Assembled Breaker

A complete factory assembled DG breaker includes the frame, trip unit, and standard line and load connectors, all factory installed and shipped as a complete breaker. Assembled breakers are only available with standard connectors.

For DC applications, use thermal magnetic trip unit only.

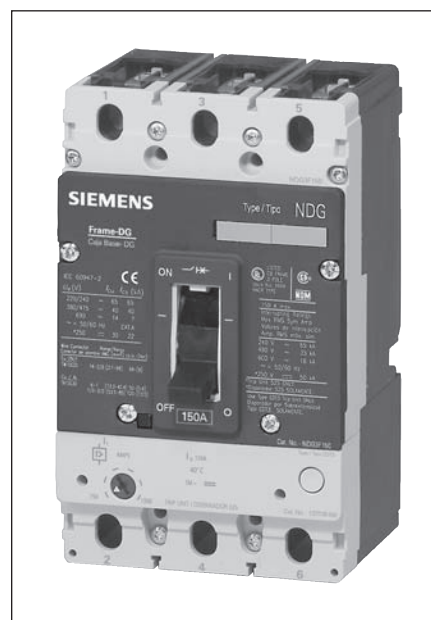
Breakers are suitable for reverse feed applications.

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.

For 100% rated breakers with a non-interchangeable trip unit, change the 3rd character of the catalog number to "W". Available in electronic and electronic with LCD only.

HACR rated.



Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)											
		UL 489						IEC 60947-2					
		Volts AC (50/60 Hz)			Volts DC			Volts AC (50/60 Hz)					
				600Y /347				220/240		380/415		690	
		240	480		250	500	I _{CU}	I _{CS}	I _{CU}	I _{CS}	I _{CU}	I _{CS}	
N	NDGB	65	35	18	30	18	65	65	40	40	12	6	
H	HDGB	100	65	18	30	18	100	75	70	70	12	6	
L	LDGB	200	100	18	30	18	200	150	100	75	12	6	

Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1
2, 3	4.1 (105)	6.9 (175)	3.4 (81)	4.2(107)

Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number
Steel	30-150	#8-1/0 Cu	1	3TW1DG20 ^②
Aluminum	30-150	#6-3/0 Al/Cu	1	3TA1DG30 ^{①②}
Copper	30-150	#6-3/0 Cu	1	3TC1DG30 ^{②④}
Distribution Lugs				
	30-150	#14-#2 Al/Cu (3pcs. Max)	3	3TA3DG02 ^②
	30-150	#14-#4 Cu, #14-#6 Al	6	3TA6DG04 ^②
Compression Lugs				
	30-150	#14-2/0 kcmil Al/Cu	—	2CLD20 ^③
	30-150	#14-2/0 kcmil Al/Cu	—	3CLD20 ^②

① Standard connector supplied with complete breakers.

② Kit consists of 3 terminal connectors.

③ 2 Lugs for 2-pole breakers.

④ Required for 100% rated DG breakers. Requires 90°C Cu cable sized at 75°C ampacity

Approx. Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit		Complete Breaker
		Thermal-Mag.	Electronic	
2, 3	3.7 (1.7)	2.2 (1.0)	2.6 (1.2)	5.9 (2.7)

DG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I _n)	Instantaneous Overcurrent Setting (I _t)	
	Min.	Max.
50	450	600
60	450	600
70	450	700
80	450	800
90	500	1000
100	500	1000
110	550	1100
125	625	1250
150	800	1600

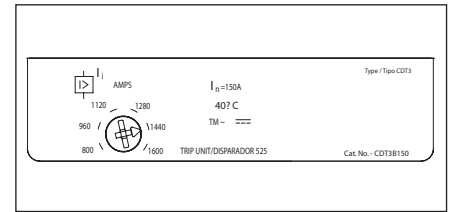
Note: Each breaker has 6 trip settings in this range.

External Accessories pages 17/43 through 17/57

VL Molded Case Circuit Breakers

DG 150A Thermal-Magnetic Trip Unit

Selection



Model 525 Trip Unit

DG 150A Frame 2-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
50	NDK2B050L	HDK2B050L	LDK2B050L
60	NDK2B060L	HDK2B060L	LDK2B060L
70	NDK2B070L	HDK2B070L	LDK2B070L
80	NDK2B080L	HDK2B080L	LDK2B080L
90	NDK2B090L	HDK2B090L	LDK2B090L
100	NDK2B100L	HDK2B100L	LDK2B100L
110	NDK2B110L	HDK2B110L	LDK2B110L
125	NDK2B125L	HDK2B125L	LDK2B125L
150	NDK2B150L	HDK2B150L	LDK2B150L

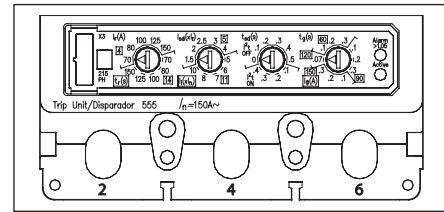
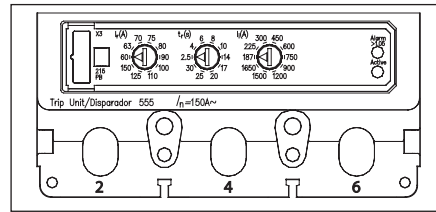
DG 150A Frame 3-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
50	NDK3B050L	HDK3B050L	LDK3B050L
60	NDK3B060L	HDK3B060L	LDK3B060L
70	NDK3B070L	HDK3B070L	LDK3B070L
80	NDK3B080L	HDK3B080L	LDK3B080L
90	NDK3B090L	HDK3B090L	LDK3B090L
100	NDK3B100L	HDK3B100L	LDK3B100L
110	NDK3B110L	HDK3B110L	LDK3B110L
125	NDK3B125L	HDK3B125L	LDK3B125L
150	NDK3B150L	HDK3B150L	LDK3B150L

VL Molded Case Circuit Breakers

DG 150A Electronic Trip Units

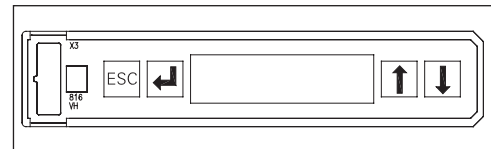
Selection



Model 555 Trip Units

DG 150A Frame 3-Pole Electronic Trip Unit^①

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
ELECTRONIC LI TRIP			
60	NDK3R060L	HDK3R060L	LDK3R060L
100	NDK3R100L	HDK3R100L	LDK3R100L
150	NDK3R150L	HDK3R150L	LDK3R150L
ELECTRONIC LSI TRIP			
60	NDK3T060L	HDK3T060L	LDK3T060L
100	NDK3T100L	HDK3T100L	LDK3T100L
150	NDK3T150L	HDK3T150L	LDK3T150L
ELECTRONIC LSIG TRIP			
60	NDK3V060L	HDK3V060L	LDK3V060L
100	NDK3V100L	HDK3V100L	LDK3V100L
150	NDK3V150L	HDK3V150L	LDK3V150L
ELECTRONIC LIG TRIP			
60	NDK3W060L	HDK3W060L	LDK3W060L
100	NDK3W100L	HDK3W100L	LDK3W100L
150	NDK3W150L	HDK3W150L	LDK3W150L



Model 586 Trip Unit

DG 150A Frame 3-Pole Electronic LCD Trip Unit^①

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
LCD ELECTRONIC LSI TRIP			
60	NDK3A060L	HDK3A060L	LDK3A060L
100	NDK3A100L	HDK3A100L	LDK3A100L
150	NDK3A150L	HDK3A150L	LDK3A150L
LCD ELECTRONIC LSIG TRIP			
60	NDK3G060L	HDK3G060L	LDK3G060L
100	NDK3G100L	HDK3G100L	LDK3G100L
150	NDK3G150L	HDK3G150L	LDK3G150L
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY			
60	NDK3K060L	HDK3K060L	LDK3K060L
100	NDK3K100L	HDK3K100L	LDK3K100L
150	NDK3K150L	HDK3K150L	LDK3K150L

^① Due to the location of the magnetic tripping solenoid, the left accessory pocket is not available for accessories.

VL Molded Case Circuit Breakers

FG 250A Frame, VL Series

Selection/Dimensions

Ordering Information

Complete Assembled Breaker

A complete factory assembled FG breaker includes the frame, trip unit, and standard line and load connectors, all factory installed and shipped as a complete breaker. Assembled breakers are available only with standard connectors.

For DC applications, use thermal magnetic trip unit only.

Breakers are suitable for reverse feed applications.

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.

HACR rated.



Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)										
	UL 489					IEC 60947-2					
	Volts AC (50/60 Hz)			Volts DC		Volts AC (50/60 Hz)					
	240	480	600 ^①	250	500	220/240		380/415		690	
						I _{cu}	I _{cs}	I _{cu}	I _{cs}	I _{cu}	I _{cs}
NFG	65	35	18	30	18	65	65	40	40	12	6
HFG	100	65	20	30	25	100	75	70	70	12	6
LFG	200	100	25	30	30	200	150	100	75	12	6

Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number
Steel	50-250	#4-350 kcmil Cu	1	3TW1FG350 ^③
Aluminum ^②	50-250	#4-350 kcmil Al/Cu	1	3TAW1FG350 ^③
Copper	50-250	#4-350 kcmil Cu	1	3TCW1FG350 ^③
Distribution Lugs				
	50-250	#12-2/0 Cu	3	3TA3FG20 ^③
	50-250	#14-#4 Cu	6	3TA6FG04 ^③

① 2-pole FG breakers are rated 600Y/347.

② Standard connector supplied with complete breakers.

③ Kit consists of 3 terminal connectors.

④ 2 Lugs for 2-pole breakers.

⑤ 3 Lugs for 3-pole breakers.

FG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I _n)	Instantaneous Overcurrent Setting (I _i)	
	Min.	Max.
100	625	1250
110	800	1600
125	800	1600
150	800	1600
175	1000	2000
200	1000	2000
225	1250	2500
250	1250	2500

Note: Each breaker has 6 trip settings in this range.

Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1
2, 3	4.1 (105)	6.9 (175)	3.4 (81)	4.2 (107)

Shipping Weight, lbs. (kg)

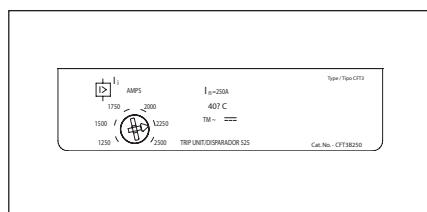
Poles	Frame	Trip Unit		Complete Breaker
		Thermal-Mag.	Electronic	
2, 3	4.0 (1.8)	2.2 (1.0)	2.6 (1.2)	6.2 (2.8)

External Accessories pages 17/43 to 17/57

VL Molded Case Circuit Breakers

FG 250A Thermal-Magnetic Trip Unit

Selection



Model 525 Trip Unit

FG 250A Frame 2-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
100	NFK2B100L	HFK2B100L	LFK2B100L
110	NFK2B110L	HFK2B110L	LFK2B110L
125	NFK2B125L	HFK2B125L	LFK2B125L
150	NFK2B150L	HFK2B150L	LFK2B150L
175	NFK2B175L	HFK2B175L	LFK2B175L
200	NFK2B200L	HFK2B200L	LFK2B200L
225	NFK2B225L	HFK2B225L	LFK2B225L
250	NFK2B250L	HFK2B250L	LFK2B250L

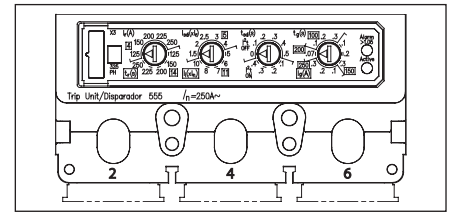
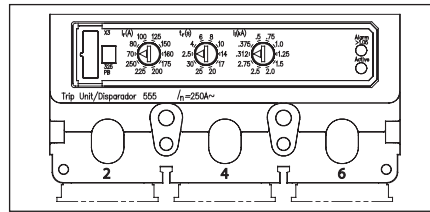
FG 250A Frame 3-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	Catalog Number
	Catalog Number	Catalog Number	Catalog Number	
	FRAME ONLY			TRIP UNIT ONLY
	NFG3F250	HFG3F250	LFG3F250	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
100	NFG3B100L	HFG3B100L	LFG3B100L	CFT3B100
110	NFG3B110L	HFG3B110L	LFG3B110L	CFT3B110
125	NFG3B125L	HFG3B125L	LFG3B125L	CFT3B125
150	NFG3B150L	HFG3B150L	LFG3B150L	CFT3B150
175	NFG3B175L	HFG3B175L	LFG3B175L	CFT3B175
200	NFG3B200L	HFG3B200L	LFG3B200L	CFT3B200
225	NFG3B225L	HFG3B225L	LFG3B225L	CFT3B225
250	NFG3B250L	HFG3B250L	LFG3B250L	CFT3B250

VL Molded Case Circuit Breakers

FG 250A Electronic 3-Knob & LCD Trip Units

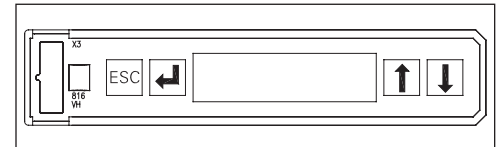
Selection



Model 555 Trip Units

FG 250A Frame 3-Pole Electronic Trip Unit^①

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NFG3F250	HFG3F250	LFG3F250	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
ELECTRONIC LI TRIP				
100	NFG3R100L	HFG3R100L	LFG3R100L	CFT3R100
150	NFG3R150L	HFG3R150L	LFG3R150L	CFT3R150
250	NFG3R250L	HFG3R250L	LFG3R250L	CFT3R250
ELECTRONIC LSI TRIP				
100	NFG3T100L	HFG3T100L	LFG3T100L	CFT3T100
150	NFG3T150L	HFG3T150L	LFG3T150L	CFT3T150
250	NFG3T250L	HFG3T250L	LFG3T250L	CFT3T250
ELECTRONIC LSIG TRIP				
100	NFG3V100L	HFG3V100L	LFG3V100L	CFT3V100
150	NFG3V150L	HFG3V150L	LFG3V150L	CFT3V150
250	NFG3V250L	HFG3V250L	LFG3V250L	CFT3V250
ELECTRONIC LIG TRIP				
100	NFG3W100L	HFG3W100L	LFG3W100L	CFT3W100
150	NFG3W150L	HFG3W150L	LFG3W150L	CFT3W150
250	NFG3W250L	HFG3W250L	LFG3W250L	CFT3W250



Model 586 Trip Unit

FG 250A Frame 3-Pole Electronic LCD Trip Unit^①

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NFG3F250	HFG3F250	LFG3F250	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
LCD ELECTRONIC LSI TRIP				
100	NFG3A100L	HFG3A100L	LFG3A100L	CFT3A100
150	NFG3A150L	HFG3A150L	LFG3A150L	CFT3A150
250	NFG3A250L	HFG3A250L	LFG3A250L	CFT3A250
LCD ELECTRONIC LSIG TRIP				
100	NFG3G100L	HFG3G100L	LFG3G100L	CFT3G100
150	NFG3G150L	HFG3G150L	LFG3G150L	CFT3G150
250	NFG3G250L	HFG3G250L	LFG3G250L	CFT3G250
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY				
100	NFG3K100L	HFG3K100L	LFG3K100L	CFT3K100
150	NFG3K150L	HFG3K150L	LFG3K150L	CFT3K150
250	NFG3K250L	HFG3K250L	LFG3K250L	CFT3K250

^① Due to the location of the magnetic tripping solenoid, the left accessory pocket is not available for accessories.

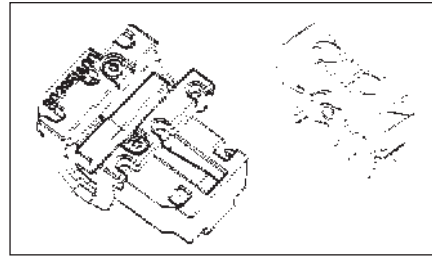
VL Molded Case Circuit Breakers

Internal Accessories for DG 150A and FG 250A Frames

Selection

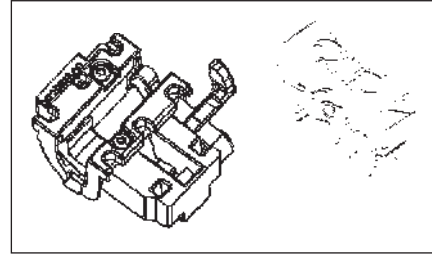
Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket ^①	Catalog Number
1 Alarm Switch 1A/B ^③ Bases AMBL2 & AMBL3	Left, Right ^②	ASKL1
2 Aux. Switches 1A + 1B Bases AMBL1	Left, Right	ASKL2
2 Aux. + 1 Alarm Switches 1A + 1B, 1A/B ^③ Bases AMBL2 & AMBL3	Left, Right ^②	ASKL3



Auxiliary/Alarm Switch Mounting Base Only

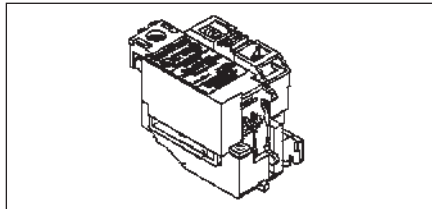
Description	Mounting Pocket	Catalog Number
Up to 3 Auxiliary Switches	Left, Right	AMBL1
2 Aux. + 1 Alarm Switch	Left Pocket Only	AMBL2
2 Aux. + 1 Alarm Switch	Right Pocket Only	AMBL3



Auxiliary/Alarm Switch Only

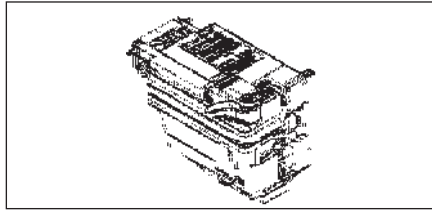
Common to DG - PG Frames

Description	Catalog Number
1 Normally Open Contact (1A)	ASWPA
1 Normally Closed Contact (1B)	ASWPB



Shunt Trips

Description	Mounting Pocket	Catalog Number
24 VDC	Right Pocket Only	STRLB24DC
48-60 VDC		STRLC60DC
110-127 VDC		STRLD125DC
220-250 VDC		STRLE250DC
48-60 VAC		STRLM60
110-127 VAC		STRLN120
208-277 VAC		STRLS277
380-600 VAC		STRLV600



Undervoltage Release

Description	Mounting Pocket	Catalog Number
12 VDC	Right Pocket Only	UVRLA12DC
24 VDC		UVRLB24DC
48 VDC		UVRLC48DC
60 VDC		UVRLG60DC
110-127 VDC		UVRLD125DC
220-250 VDC		UVRLE250DC
24 VAC		UVRL24
110-127 VAC		UVRLN120
220-240 VAC		UVRLR240
208 VAC		UVRLP208
277 VAC		UVRLS277
380-415 VAC		UVRLT415
440-480 VAC		UVRLU480

^① Refer to the "Accessory Locations" chart on page 17/58 for guidelines and limitations about which pockets may be used for accessory combinations.

^② These kits include two bases, one for mounting switches in the left pocket and another for mounting in the right.

^③ Includes 1A and 1B contact for alarm purposes, only one of which may be installed at any time.

'A' refers to a normally open contact (open when the breaker contacts are open).

'B' refers to a normally closed contact (closed when the breaker contacts are open).

External Accessories pages 17/43 through 17/57

VL Molded Case Circuit Breakers

JG 400A Frame, VL Series

Selection/Dimensions

Ordering Information

Complete Assembled Breaker

A complete factory assembled JG breaker includes the frame, trip unit, and standard line and load connectors, all factory installed and shipped as a complete breaker. Assembled breakers are available only with standard connectors.

For any other configuration, order the frame, trip unit, and terminals as separate items.

For DC applications, use thermal magnetic trip unit only.

For reverse feed applications, select non-interchangeable trip breakers only.

For non-interchangeable trip breakers, change the third digit of the catalog number to "X" for standard breakers.

For 100% rated breakers with a non-interchangeable trip unit, change the 3rd character of the catalog number to "Y".

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.

HACR rated.



Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1
2, 3	5.5 (139)	11 (279)	4.2 (102)	5.4 (138)

Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)									
		UL 489 AIR (File E10848)					IEC 60947-2				
		Volts AC (50/60 Hz)					Volts AC (50/60 Hz)				
		240	480	600	250	500	220/240	380/415	690		
N	NJGA	65	35	25	30	25	65	65	45	45	12
H	HJGA	100	65	25	30	35	100	75	70	70	15
L	LJGA	200	100	25	30	35	200	150	100	75	15

Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit		Complete Breaker
		Thermal-Mag.	Electronic	
2, 3	9.3 (4.2)	4.0 (1.8)	4.0 (1.8)	12.6 (5.7)

Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number
Steel	70-400	1/0-600 kcmil Cu	1	3TW1JG600 ^②
Aluminum	70-400	3/0-250 kcmil Al/Cu	2	3TA2JG250 ^{①②}
Aluminum	70-400	250-750 kcmil Al	1	3TA1JG750 ^②
Aluminum	70-400	3/0-600 kcmil Cu	1	3TA1JG750 ^②
Copper	70-400	3/0-600 kcmil Cu	1	TC1JG750 ^③
Copper	70-400	3/0-250 kcmil Cu	2	TC2JG250 ^③
Distribution Lugs				
	70-400	#14-4 Cu	12	3TA12JG04 ^②
	70-400	#14-2/0 Al/Cu	6	3TA6JG20 ^②
Compression Lugs				
	70-400	#6-350 kcmil	—	3CLJ350 ^②
	70-400	250-600 kcmil	—	3CLJ600 ^②
	70-400	250-750 kcmil	—	3CLJ750 ^②

① Standard construction supplied for each breaker.

② Kit consists of 3 terminal connectors.

③ Required for 100% rated JG breakers. Requires 90°C Cu cable sized at 75°C ampacity.

JG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I _n)	Instantaneous Overcurrent Setting (I _i)	
	Min.	Max.
250	1250	2500
300	1500	3000
350	1750	3500
400	2000	4000

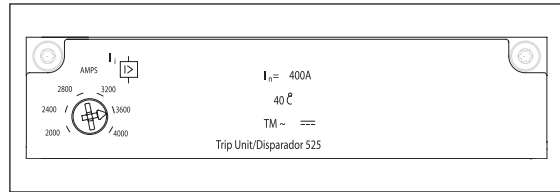
Note: Each breaker has 6 trip settings in this range.

External Accessories pages 17/43 through 17/57

VL Molded Case Circuit Breakers

JG 400A Thermal-Magnetic Trip Unit

Selection



Model 525 Trip Unit

JG 400A Frame 2-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			
	NJG2F400	HJG2F400	LJG2F400	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
250	NJG2B250L	HJG2B250L	LJG2B250L	CJT2B250
300	NJG2B300L	HJG2B300L	LJG2B300L	CJT2B300
350	NJG2B350L	HJG2B350L	LJG2B350L	CJT2B350
400	NJG2B400L	HJG2B400L	LJG2B400L	CJT2B400

JG 400A Frame 3-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			
	NJG3F400	HJG3F400	LJG3F400	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
250	NJG3B250L	HJG3B250L	LJG3B250L	CJT3B250
300	NJG3B300L	HJG3B300L	LJG3B300L	CJT3B300
350	NJG3B350L	HJG3B350L	LJG3B350L	CJT3B350
400	NJG3B400L	HJG3B400L	LJG3B400L	CJT3B400

JJ 400A Frame 240V max., 2-pole with Thermal-Magnetic Non-Interchangeable Trip Unit^①

Continuous Ampere Rating	N-Interrupting Class
	Catalog Number
	COMPLETE BREAKER
250	NJJ2B250
300	NJJ2B300
350	NJJ2B350
400	NJJ2B400

JJ 400A Frame 240V max., 3-pole with Thermal-Magnetic Non-Interchangeable Trip Unit^①

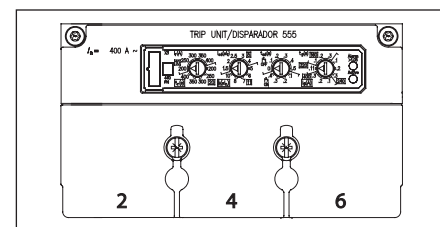
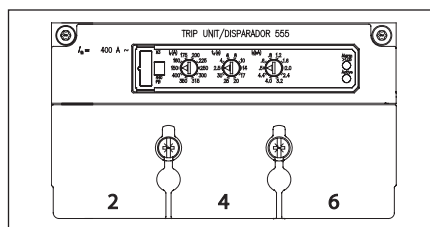
Continuous Ampere Rating	N-Interrupting Class
	Catalog Number
	COMPLETE BREAKER
250	NJJ3B250
300	NJJ3B300
350	NJJ3B350
400	NJJ3B400

^① Terminal connectors must be ordered separately.
Breaker Type NJJA.

VL Molded Case Circuit Breakers

JG 400A Electronic 3-Knob & LCD Trip Units

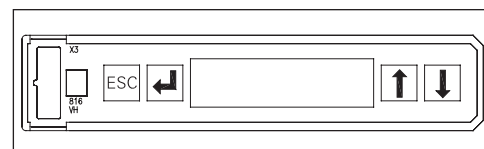
Selection



Model 555 Trip Units

JG 400A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NJG3F400	HJG3F400	LJG3F400	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
ELECTRONIC LI TRIP				
250	NJG3R250L	HJG3R250L	LJG3R250L	CJT3R250
400	NJG3R400L	HJG3R400L	LJG3R400L	CJT3R400
ELECTRONIC LSI TRIP				
250	NJG3T250L	HJG3T250L	LJG3T250L	CJT3T250
400	NJG3T400L	HJG3T400L	LJG3T400L	CJT3T400
ELECTRONIC LSIG TRIP				
250	NJG3V250L	HJG3V250L	LJG3V250L	CJT3V250
400	NJG3V400L	HJG3V400L	LJG3V400L	CJT3V400
ELECTRONIC LIG TRIP				
250	NJG3W250L	HJG3W250L	LJG3W250L	CJT3W250
400	NJG3W400L	HJG3W400L	LJG3W400L	CJT3W400



Model 586 Trip Unit

JG 400A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NJG3F400	HJG3F400	LJG3F400	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
LCD ELECTRONIC LSI TRIP				
250	NJG3A250L	HJG3A250L	LJG3A250L	CJT3A250
400	NJG3A400L	HJG3A400L	LJG3A400L	CJT3A400
LCD ELECTRONIC LSIG TRIP				
250	NJG3G250L	HJG3G250L	LJG3G250L	CJT3G250
400	NJG3G400L	HJG3G400L	LJG3G400L	CJT3G400
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY				
250	NJG3K250L	HJG3K250L	LJG3K250L	CJT3K250
400	NJG3K400L	HJG3K400L	LJG3K400L	CJT3K400

VL Molded Case Circuit Breakers

LG 600A Frame, VL Series

Selection/Dimensions

Ordering Information

Complete Assembled Breaker

A complete factory assembled LG breaker includes the frame, trip unit, and standard line and load lugs, all factory installed and shipped as a complete breaker. Assembled breakers are available only with standard connectors.

For DC applications, use thermal magnetic trip unit only.

Breakers are suitable for reverse feed applications.

For special applications, refer to page 17/62.

Mounting hardware is included with each breaker.

For 100% rated breakers, change the 3rd character of the catalog number to "W". Available on 400/500 Amp only (3-pole only).

HACR rated.



Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)										
		UL 489					IEC 60947-2					
		Volts AC (50/60 Hz)			Volts DC		Volts AC (50/60 Hz)					
							220/240		380/415		690	
		240	480	600	250	500	I _{CU}	I _{CS}	I _{CU}	I _{CS}	I _{CU}	I _{CS}
N	NLGB	65	35	18	30	25	65	65	45	45	12	6
H	HLGB	100	65	18 ^①	30	35	100	75	70	70	15	8
L	LLGB	200	100	18	30	35	200	150	100	75	15	8

① Special 600Vac 25kA thermal-magnetic version (Type HLGC) available, see page 17/28.

Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1
2, 3	5.5 (139)	11 (279)	4.2 (102)	5.4 (138)
Ext. Shield		13.6 (345.5)		

Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number ^③
Aluminum	150-600	#2-600 kcmil Al/Cu	2 (load side)	3TA2LG600LD ^②
Aluminum	150-600	#2-600 kcmil Al/Cu	2 (line side)	3TA2LG600LN ^②
Copper	150-600	#2-600 kcmil Cu	2 (load side)	3TC2LG600LD ^③
Copper	150-600	#2-600 kcmil Cu	2 (line side)	3TC2LG600LN ^③
Compression Lugs				
	150-600	#6-350 kcmil Al/Cu	—	6CLL350 ^④
	150-600	250-750 kcmil Al/Cu	—	3CLL750 ^③
	150-600	250-600 kcmil Al/Cu	—	6CLL600 ^⑤

② Standard construction supplied for each breaker.

③ Kit consists of 3 terminal connectors.

④ Kit consists of 6 lugs for Line or Load end.

⑤ Required for 100% rated LG breakers. Requires 90°C Cu cable sized at 75°C ampacity.

Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit		Complete Breaker
		Thermal-Mag.	Electronic	
2, 3	17.4 (7.9)	3.5 (1.6)	4.2 (1.9)	20.9 (9.5)

LG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I _n)	Instantaneous Overcurrent Setting (I _i)	
	Min.	Max.
400	2000	4000
500	2500	5000
600	2750	5500

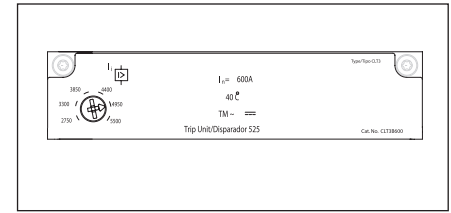
Note: Each breaker has 6 trip settings.

External Accessories pages 17/43 through 17/57

VL Molded Case Circuit Breakers

LG 600A Thermal-Magnetic Trip Unit

Selection



Model 525 Trip Unit

LG 600A Frame 2-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
400	NLK2B400L	HLK2B400L	LLK2B400L
500	NLK2B500L	HLK2B500L	LLK2B500L
600	NLK2B600L	HLK2B600L	LLK2B600L

LG 600A Frame 3-Pole with Thermal-Magnetic Trip Unit^①

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
400	NLK3B400L	HLK3B400L	LLK3B400L
500	NLK3B500L	HLK3B500L	LLK3B500L
600	NLK3B600L	HLK3B600L	LLK3B600L

LG 600A Frame 2-Pole with Thermal-Magnetic Trip Unit , 600Vac 25kA only^②

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
400	—	HLV2B400L	—
500	—	HLV2B500L	—
600	—	HLV2B600L	—

LG 600A Frame 3-Pole with Thermal-Magnetic Trip Unit , 600Vac 25kA only^{①②}

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
400	—	HLV3B400L	—
500	—	HLV3B500L	—
600	—	HLV3B600L	—

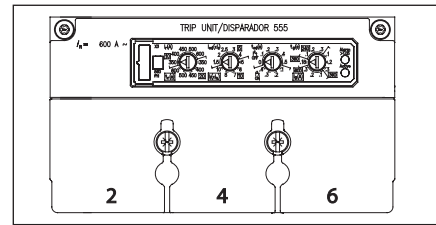
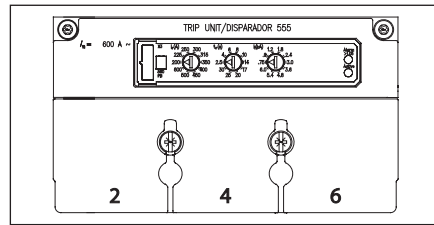
① For 100% rated 400A or 500A versions, change the third character of the catalog number to "Z".

② Consult sales office for availability.

VL Circuit Breakers

LG 600A Electronic Trip Units

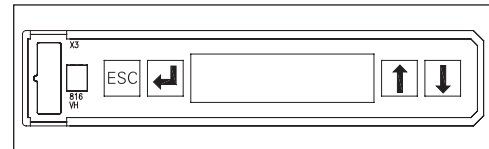
Selection



Model 555 Trip Unit

LG 600A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
ELECTRONIC LI TRIP			
400	NLK3R400L	HLK3R400L	LLK3R400L
600	NLK3R600L	HLK3R600L	LLK3R600L
ELECTRONIC LSI TRIP			
400	NLK3T400L	HLK3T400L	LLK3T400L
600	NLK3T600L	HLK3T600L	LLK3T600L
ELECTRONIC LSIG TRIP			
400	NLK3V400L	HLK3V400L	LLK3V400L
600	NLK3V600L	HLK3V600L	LLK3V600L
ELECTRONIC LIG TRIP			
400	NLK3W400L	HLK3W400L	LLK3W400L
600	NLK3W600L	HLK3W600L	LLK3W600L



Model 586 Trip Unit

LG 600A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
ELECTRONIC LSI TRIP			
400	NLK3A400L	HLK3A400L	LLK3A400L
600	NLK3A600L	HLK3A600L	LLK3A600L
ELECTRONIC LSIG TRIP			
400	NLK3G400L	HLK3G400L	LLK3G400L
600	NLK3G600L	HLK3G600L	LLK3G600L
ELECTRONIC LSI TRIP + GF ALARM ONLY			
400	NLK3K400L	HLK3K400L	LLK3K400L
600	NLK3K600L	HLK3K600L	LLK3K600L

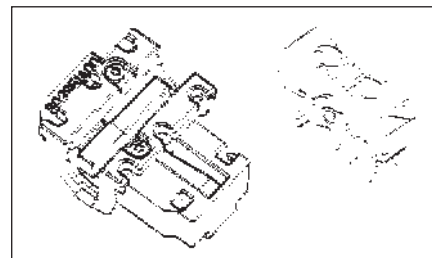
VL Molded Case Circuit Breakers

Internal Accessories for JG 400A and LG 600A Frames

Selection

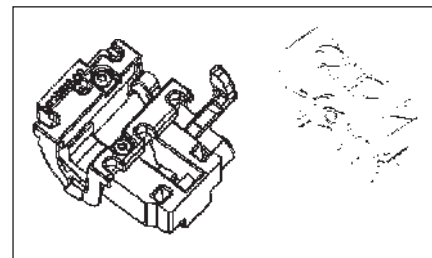
Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket ^①	Catalog Number
1 Alarm Switch 1A/B ^③ Bases AMBL2 & AMBL3	Left, Right ^②	ASKL1
2 Aux. Switches 1A + 1B Bases AMBL1	Left, Right	ASKL2
2 Aux. + 1 Alarm Switches 1A + 1B, 1A/B ^③ Bases AMBL2 & AMBL3	Left, Right ^②	ASKL3



Auxiliary/Alarm Switch Mounting Base Only

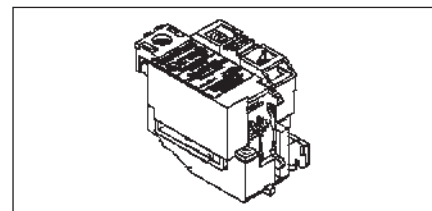
Description	Mounting Pocket	Catalog Number
Up to 3 Auxiliary Switches	Left, Right	AMBL1
2 Aux. + 1 Alarm Switch	Left Pocket Only	AMBL2
2 Aux. + 1 Alarm Switch	Right Pocket Only	AMBL3



Auxiliary/Alarm Switch Only

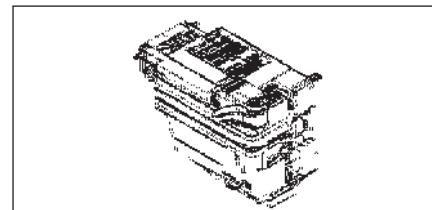
Common to DG - PG Frames

Description	Catalog Number
1 Normally Open Contact (1A)	ASWPA
1 Normally Closed Contact (1B)	ASWPB



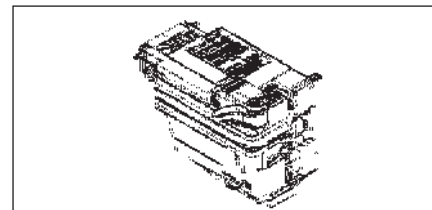
Shunt Trips

Description	Mounting Pocket	Catalog Number
24 VDC	Right Pocket Only	STRLB24DC
48-60 VDC		STRLC60DC
110-127 VDC		STRLD125DC
220-250 VDC		STRLE250DC
48-60 VAC		STRLM60
110-127 VAC		STRLN120
208-277 VAC		STRLS277
380-600 VAC		STRLV600



Undervoltage Release

Description	Mounting Pocket	Catalog Number
12 VDC	Right Pocket Only	UVRLA12DC
24 VDC		UVRLB24DC
48 VDC		UVRLC48DC
60 VDC		UVRLG60DC
110-127 VDC		UVRLD125DC
220-250 VDC		UVRLE250DC
24 VAC		UVRLI24
110-127 VAC		UVRLN120
220-240 VAC		UVRLR240
208 VAC		UVRLP208
277 VAC		UVRLS277
380-415 VAC		UVRLT415
440-480 VAC		UVRLU480



① Refer to the "Accessory Locations" chart on page 17/58 for guidelines and limitations about which pockets may be used for accessory combinations.

② Includes 1A and 1B contact for alarm purposes, only one of which may be installed at any time.

'A' refers to a normally open contact (open when the breaker contacts are open).

'B' refers to a normally closed contact (closed when the breaker contacts are open).

VL Molded Case Circuit Breakers

MG 800A Frame, VL Series

Selection/Dimensions

Ordering Information

Complete Assembled Breaker

A complete factory assembled MG breaker includes the frame, trip unit, and standard line and load lugs, all factory installed and shipped as a complete breaker. Assembled breakers are available only with standard connectors.

For any other configuration, order the frame, trip unit, and terminals as separate items.

For DC applications, use thermal magnetic trip unit only.

For reverse feed applications, select non-interchangeable trip breakers only. For non-interchangeable trip breakers, change the third digit of the catalog number to "X" for standard breakers.

For 100% rated breakers with a non-interchangeable trip unit, change the 3rd character of the catalog number to "Y".

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.

HACR rated.



Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1
2, 3	7.5 (190)	16 (406)	4.7 (119)	5.9 (151)

Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)											
		UL 489						IEC 60947-2					
		Volts AC (50/60 Hz)			Volts DC			Volts AC (50/60 Hz)					
		240	480	600	250	500	220/240		380/415		690		
						I _{cu}	I _{cs}	I _{cu}	I _{cs}	I _{cu}	I _{cs}		
N	NMG	65	35	25	22	35	65	65	50	50	20	10	
H	HMG	100	65	35	25	50	100	75	70	70	30	15	
L	LMG	200	100	50	42	65	200	150	100	75	35	17	

Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit	Complete Breaker
2, 3	31.3 (14.2)	4.0 (1.8)	35.3 (16.0)

Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number
Aluminum	200-800A	1/0-500 kcmil Al/Cu	3	3TA3MG500 ^{①②}
Aluminum	200-800A	500-750 kcmil Al/Cu	2	3TA2MG750 ^②
Copper	200-800A	1/0-500 kcmil Cu	3	TC3MG500 ^{③⑤}
Aluminum	200-800A	#2-600 kcmil Al/Cu	3	3TA3MG600 ^{②④}

① Standard connector supplied with complete breakers.

② Kit consists of 3 terminal connectors.

③ Consists of one terminal.

④ Includes extended terminal cover.

⑤ Required for 100% rated MG breakers. Requires 90°C Cu cable sized at 75°C ampacity.

MG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I _n)	Instantaneous Overcurrent Setting (I _b)	
	Min.	Max.
600	3000	6000
700	3250	6500
800	3250	6500

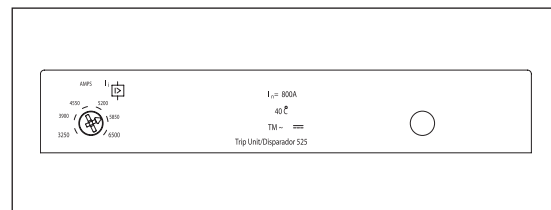
Note: Each breaker has 6 trip settings.

External Accessories pages 17/43 through 17/57

VL Molded Case Circuit Breakers

MG 800A Thermal-Magnetic Trip Unit

Selection



Model 525 Trip Unit

MG 800A Frame 2-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NMG2F800	HMG2F800	LMG2F800	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
600	NMG2B600L	HMG2B600L	LMG2B600L	CMT2B600
700	NMG2B700L	HMG2B700L	LMG2B700L	CMT2B700
800	NMG2B800L	HMG2B800L	LMG2B800L	CMT2B800

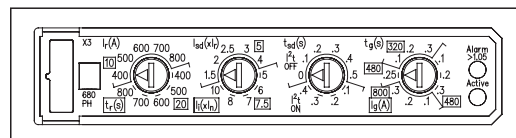
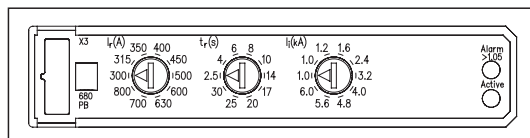
MG 800A Frame 3-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NMG3F800	HMG3F800	LMG3F800	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
600	NMG3B600L	HMG3B600L	LMG3B600L	CMT3B600
700	NMG3B700L	HMG3B700L	LMG3B700L	CMT3B700
800	NMG3B800L	HMG3B800L	LMG3B800L	CMT3B800

VL Molded Case Circuit Breakers

MG 800A Electronic 3-Knob & LCD Trip Units

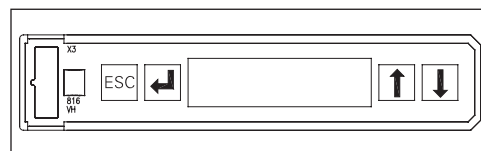
Selection



Model 555 Trip Units

MG 800A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NMG3F800	HMG3F800	LMG3F800	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
ELECTRONIC LI TRIP				
600 800	NMG3R600L NMG3R800L	HMG3R600L HMG3R800L	LMG3R600L LMG3R800L	CMT3R600 CMT3R800
ELECTRONIC LSI TRIP				
600 800	NMG3T600L NMG3T800L	HMG3T600L HMG3T800L	LMG3T600L LMG3T800L	CMT3T600 CMT3T800
ELECTRONIC LSIG TRIP				
600 800	NMG3V600L NMG3V800L	HMG3V600L HMG3V800L	LMG3V600L LMG3V800L	CMT3V600 CMT3V800
ELECTRONIC LIG TRIP				
600 800	NMG3W600L NMG3W800L	HMG3W600L HMG3W800L	LMG3W600L LMG3W800L	CMT3W600 CMT3W800



Model 586 Trip Unit

MG 800A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NMG3F800	HMG3F800	LMG3F800	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
LCD ELECTRONIC LSI TRIP				
600 800	NMG3A600L NMG3A800L	HMG3A600L HMG3A800L	LMG3A600L LMG3A800L	CMT3A600 CMT3A800
LCD ELECTRONIC LSIG TRIP				
600 800	NMG3G600L NMG3G800L	HMG3G600L HMG3G800L	LMG3G600L LMG3G800L	CMT3G600 CMT3G800
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY				
600 800	NMG3K600L NMG3K800L	HMG3K600L HMG3K800L	LMG3K600L LMG3K800L	CMT3K600 CMT3K800

VL Molded Case Circuit Breakers

NG 1200A Frame, VL Series

Selection/Dimensions

Ordering Information

Complete Assembled Breaker with Lugs

A complete factory assembled NG breaker includes the frame, trip unit, and standard line and load lugs, all factory installed and shipped as a complete breaker. Assembled breakers are available only with standard connectors.

For any other configuration, order the frame, trip unit, and terminals as separate items.

For DC applications, use thermal magnetic trip unit only.

For reverse feed applications, select non-interchangeable trip breakers only. For non-interchangeable trip breakers, change the third digit of the catalog number to "X" for standard breakers.

For 100% rated breakers with a non-interchangeable trip unit, change the 3rd character of the catalog number to "Y".

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.

A Toggle Handle Extension is included with each frame or complete breaker.

HACR rated.



Dimensions, inches (mm)

Number of Poles	W	L	D	To Handle D1
2, 3	9 (229)	16 (406)	6 (152)	8.1 (207)

Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)										
		UL 489					IEC 60947-2					
		Volts AC (50/60 Hz)			Volts DC		Volts AC (50/60 Hz)					
							220/240		380/415		690	
		240	480	600	250	500	I _{cu}	I _{cs}	I _{cu}	I _{cs}	I _{cu}	I _{cs}
N	NNG	65	35	25	22	35	65	35	50	25	20	10
H	HNG	100	65	35	25	50	100	50	70	35	30	15
L	LNG	200	100	65	42	65	200	100	100	50	35	17

Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit	Complete Breaker
2, 3	46.3 (21.0)	8.8 (4.0)	55.1 (25.0)

Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number
Aluminum	300-1200A	1/0-500 kcmil Al/Cu	4	3TA4NG500 ^{③④}
Aluminum	300-1200A	500-750 kcmil Al/Cu	3	3TA3NG750 ^④
Copper	300-1200A	1/0-500 kcmil Cu	4	3TC4NG500 ^{②④}
Aluminum	300-1200A	1/0-500 kcmil Al/Cu	4	3TA4NG500H ^{②④}
Compression Lugs				
	300-1200A	1/0-500 kcmil Al/Cu	—	12CLN500 ^①

① Total of 12 connectors (4 per phase Line or Load).

② For 100% rated NG breakers. Requires 90°C Cu cable sized at 75°C ampacity.

③ Standard connector provided with complete breakers.

④ Kit consists of 3 terminal connectors.

NG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I _n)	Instantaneous Overcurrent Setting (I _t)	
	Min.	Max.
800	4000	8000
900	5000	10000
1000	5000	10000
1200	7000	12000

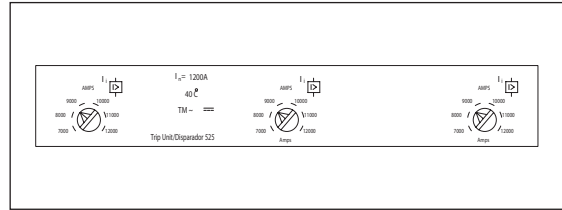
Note: Each breaker has 6 trip settings.

External Accessories pages 17/43 through 17/57

VL Molded Case Circuit Breakers

NG 1200A Thermal-Magnetic Trip Unit

Selection



Model 525 Trip Unit

NG 1200A Frame 2-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NNG2F120	HNG2F120	LNG2F120	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
800	NNG2B800L	HNG2B800L	LNG2B800L	CNT2B800
900	NNG2B900L	HNG2B900L	LNG2B900L	CNT2B900
1000	NNG2B100L	HNG2B100L	LNG2B100L	CNT2B100
1200	NNG2B120L	HNG2B120L	LNG2B120L	CNT2B120

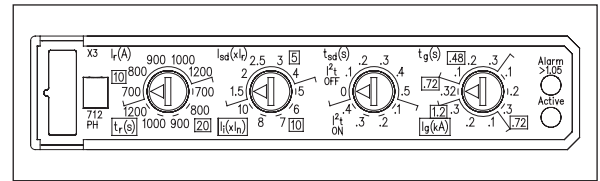
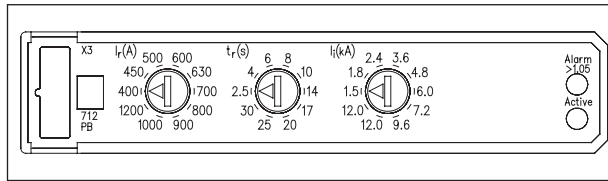
NG 1200A Frame 3-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NNG3F120	HNG3F120	LNG3F120	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
800	NNG3B800L	HNG3B800L	LNG3B800L	CNT3B800
900	NNG3B900L	HNG3B900L	LNG3B900L	CNT3B900
1000	NNG3B100L	HNG3B100L	LNG3B100L	CNT3B100
1200	NNG3B120L	HNG3B120L	LNG3B120L	CNT3B120

VL Molded Case Circuit Breakers

NG 1200A Electronic Trip Units

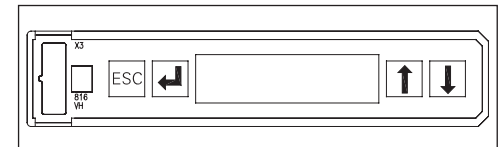
Selection



Model 555 Trip Units

NG 1200A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NNG3F120	HNG3F120	LNG3F120	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
ELECTRONIC LI TRIP				
800	NNG3R800L	HNG3R800L	LNG3R800L	CNT3R800
1000	NNG3R100L	HNG3R100L	LNG3R100L	CNT3R100
1200	NNG3R120L	HNG3R120L	LNG3R120L	CNT3R120
ELECTRONIC LSI TRIP				
800	NNG3T800L	HNG3T800L	LNG3T800L	CNT3T800
1000	NNG3T100L	HNG3T100L	LNG3T100L	CNT3T100
1200	NNG3T120L	HNG3T120L	LNG3T120L	CNT3T120
ELECTRONIC LSIG TRIP				
800	NNG3V800L	HNG3V800L	LNG3V800L	CNT3V800
1000	NNG3V100L	HNG3V100L	LNG3V100L	CNT3V100
1200	NNG3V120L	HNG3V120L	LNG3V120L	CNT3V120
ELECTRONIC LIG TRIP				
800	NNG3W800L	HNG3W800L	LNG3W800L	CNT3W800
1000	NNG3W100L	HNG3W100L	LNG3W100L	CNT3W100
1200	NNG3W120L	HNG3W120L	LNG3W120L	CNT3W120



Model 586 Trip Unit

NG 1200A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NNG3F120	HNG3F120	LNG3F120	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
LCD ELECTRONIC LSI TRIP				
800	NNG3A800L	HNG3A800L	LNG3A800L	CNT3A800
1000	NNG3A100L	HNG3A100L	LNG3A100L	CNT3A100
1200	NNG3A120L	HNG3A120L	LNG3A120L	CNT3A120
LCD ELECTRONIC LSIG TRIP				
800	NNG3G800L	HNG3G800L	LNG3G800L	CNT3G800
1000	NNG3G100L	HNG3G100L	LNG3G100L	CNT3G100
1200	NNG3G120L	HNG3G120L	LNG3G120L	CNT3G120
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY				
800	NNG3K800L	HNG3K800L	LNG3K800L	CNT3K800
1000	NNG3K100L	HNG3K100L	LNG3K100L	CNT3K100
1200	NNG3K120L	HNG3K120L	LNG3K120L	CNT3K120

VL Molded Case Circuit Breakers

PG 1600A Frame, VL Series & Thermal-Magnetic Trip Unit

Selection/Dimensions

Ordering Information

A complete factory assembled PG breaker includes the frame and trip unit only. The connectors must be ordered as separate items.

PG thermal-magnetic breakers sold as non-interchangeable only.

For any other configuration, order the frame, trip unit, and connectors as separate items.

Connectors require a Breaker Lug Mounting Assembly or Breaker Mounting Base and must be ordered as a separate item.

For DC applications, use Thermal magnetic trip unit only.

For reverse feed applications select non-interchangeable trip breakers only. Change the third digit of the catalog number to "X" for non-interchangeable trip breakers.

For 100% rated breakers with a non-interchangeable trip unit, change the 3rd character of the catalog number to "Y".

For special applications, refer to page 17/62.

Mounting hardware is included with each frame or complete breaker.

A Toggle Handle Extension is included with each frame or complete breaker.



Dimensions, inches (mm)

Number of Poles	W	L	D	To Handle D1
2, 3	9 (229)	16 (406)	6 (152)	8.1 (207)

Interrupting Ratings

Interrupting Class	Breaker Type	RMS Symmetrical Amperes (KA)										
		UL 489					IEC 60947-2					
		Volts AC (50/60 Hz)			Volts DC		Volts AC (50/60 Hz)					
							220/240		380/415		690	
		240	480	600	250	500	I _{cu}	I _{cs}	I _{cu}	I _{cs}	I _{cu}	I _{cs}
N	NPG	65	35	25	22	35	65	35	50	25	20	10
H	HPG	100	65	35	25	50	100	50	70	35	30	15
L	LPG	200	100	65	42	65	200	100	100	50	35	17

Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit	Complete Breaker
2, 3	60.2 (27.3)	8.8 (4.0)	69.0 (31.3)

Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per phase	Catalog Number
Aluminum	1200-1600A	1/0-750 kcmil Al/Cu	6	3TA6PG750 ^{①③}
Aluminum	1200-1600A	300-600 kcmil Al/Cu	5	TA5P600 ^{②④}
Aluminum	1200-1600A	600-750 kcmil Al/Cu	4	TA4P750 ^{②④}
Aluminum	1200-1600A	300-600 kcmil Al/Cu	6	TA6R600 ^{②④}
Copper	1200-1600A	300-600 kcmil Cu	5	TC5R600 ^{②④⑤}

① Requires Lug Mounting Assembly LMAP1600.

② Requires Breaker Mounting Base MBPG1600 Kit or MBPG1601.

③ Consists of 3 connectors.

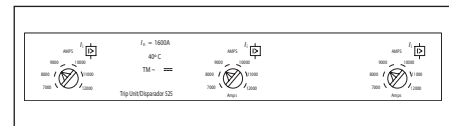
④ Consists of 1 connector.

⑤ Required for 100% rated PG breakers. Requires 90°C cable sized at 75°C ampacity.

PG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I _n)	Instantaneous Overcurrent Setting (I _i)	
	Min.	Max.
1200	7000	12000
1400	7000	12000
1600	7000	12000

Note: Each breaker has 6 trip settings in this range.



Model 525 Trip Unit

Mounting Arrangement

Description	Catalog Number
Lug Mounting Assembly	LMAP1600
Breaker Mounting Base (Front Connect)	MBPG1600
Breaker Mounting Base (Rear Connect)	MBPG1601

PG 1600A Frame 3-Pole with Thermal-Magnetic Trip Unit

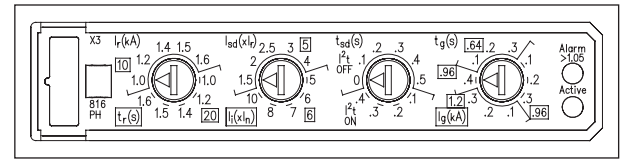
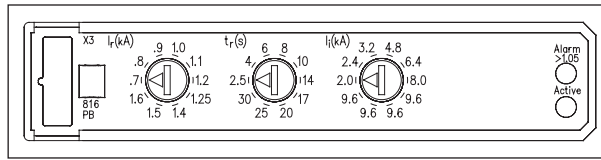
Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class
	Catalog Number	Catalog Number	Catalog Number
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER		
1200	NPX3B120	HPX3B120	LPX3B120
1400	NPX3B140	HPX3B140	LPX3B140
1600	NPX3B160	HPX3B160	LPX3B160

External Accessories pages 17/43 through 17/57

VL Molded Case Circuit Breakers

PG 1600A Electronic Trip Units

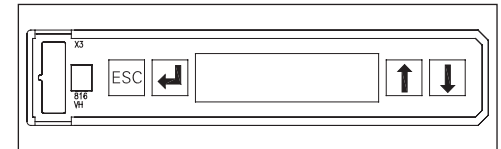
Selection



Model 555 Trip Unit

PG 1600A Frame 3-Pole Electronic Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NPG3F160	HPG3F160	LPG3F160	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
ELECTRONIC LI TRIP				
1200 1600	NPG3R120 NPG3R160	HPG3R120 HPG3R160	LPG3R120 LPG3R160	CPT3R120 CPT3R160
ELECTRONIC LSI TRIP				
1200 1600	NPG3T120 NPG3T160	HPG3T120 HPG3T160	LPG3T120 LPG3T160	CPT3T120 CPT3T160
ELECTRONIC LSIG TRIP				
1200 1600	NPG3V120 NPG3V160	HPG3V120 HPG3V160	LPG3V120 LPG3V160	CPT3V120 CPT3V160
ELECTRONIC LIG TRIP				
1200 1600	NPG3W120 NPG3W160	HPG3W120 HPG3W160	LPG3W120 LPG3W160	CPT3W120 CPT3W160



Model 586 Trip Unit

PG 1600A Frame 3-Pole Electronic LCD Trip Unit

Continuous Ampere Rating	N-Interrupting Class	H-Interrupting Class	L-Interrupting Class	
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
	FRAME ONLY			TRIP UNIT ONLY
	NPG3F160	HPG3F160	LPG3F160	
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER			
LCD ELECTRONIC LSI TRIP				
1200 1600	NPG3A120 NPG3A160	HPG3A120 HPG3A160	LPG3A120 LPG3A160	CPT3A120 CPT3A160
LCD ELECTRONIC LSIG TRIP				
1200 1600	NPG3G120 NPG3G160	HPG3G120 HPG3G160	LPG3G120 LPG3G160	CPT3G120 CPT3G160
LCD ELECTRONIC LSI TRIP + GF ALARM ONLY				
1200 1600	NPG3K120 NPG3K160	HPG3K120 HPG3K160	LPG3K120 LPG3K160	CPT3K120 CPT3K160

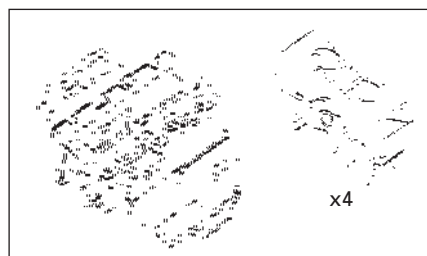
VL Molded Case Circuit Breakers

Internal Accessories for MG 800A, NG 1200A, and PG 1600A Frames

Selection

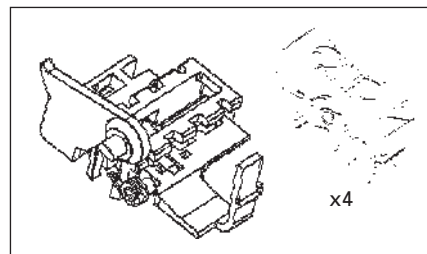
Auxiliary Switch and Alarm Switch Combination Kits

Description	Mounting Pocket ^①	Catalog Number
2 Aux. + 2 Alarm Switches 2A + 2B Base AMBP2	Left Pocket Only	ASKP3
4 Aux. Switches 2A + 2B Base AMBP1	Left, Right	ASKP4



Auxiliary/Alarm Switch Mounting Base Only

Description	Mounting Pocket ^①	Catalog Number
Up to 4 Auxiliary Switches 2 Aux. + 2 Alarm Switches	Left, Right Left Pocket Only	AMBP1 AMBP2



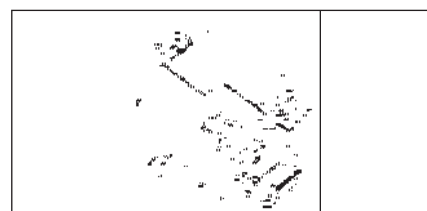
Auxiliary/Alarm Switch Only

Common to DG-PG Frames

Description	Catalog Number
1 Normally Open Contact (1A)	ASWPA
1 Normally Closed Contact (1B)	ASWPB

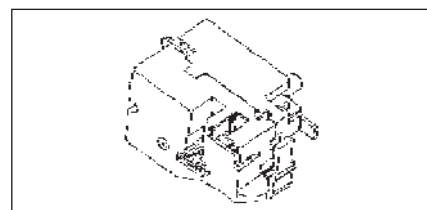
Shunt Trips

Description	Mounting Pocket	Catalog Number
24 VDC	Right Pocket Only	STRPB24DC
48-60 VDC		STRPC60DC
110-127 VDC		STRPD125DC
220-250 VDC		STRPE250DC
48-60 VAC		STRPM60
110-127 VAC		STRPN120
208-277 VAC		STRPS277
380-600 VAC		STRPV600



Undervoltage Release

Description	Mounting Pocket	Catalog Number
12 VDC	Right Pocket Only	UVRPA12DC
24 VDC		UVRPB24DC
48 VDC		UVRPC48DC
60 VDC		UVRPG60DC
110-127 VDC		UVRPD125DC
220-250 VDC		UVRPE250DC
110-127 VAC		UVRPN120
220-240 VAC		UVRPR240
208 VAC		UVRPP208
277 VAC		UVRPS277
380-415 VAC		UVRPT415
440-480 VAC		UVRPU480



① Refer to the "Accessory Locations" chart on page 17/58 for guidelines and limitations about which pockets may be used for accessory combinations.
'A' refers to a normally open contact (open when the breaker contacts are open).
'B' refers to a normally closed contact (closed when the breaker contacts are open).

VL Molded Case Circuit Breakers

Molded Case Switch

Selection

General

Typically a molded case switch is used when a compact load-break switch is needed for disconnect purposes. The VL line of molded case switches from Siemens is made of the same materials and components as the VL circuit breakers but do not provide overcurrent protection. Each molded case

switch has a fixed instantaneous self-protecting trip element which may open the switch under high fault conditions.

Application Note

Overcurrent protection must be provided by an appropriate overcurrent protective device located upstream from

the molded case switch. Also, the short-circuit current rating of the switch is limited to the interrupting rating of the upstream protective device or the ratings in the table below, **whichever is less.**

Ordering Information

Each type VL molded case switch accepts the same terminals and accessories as the equivalent VL circuit breakers.

All type VL molded case switches are suitable for reverse feed applications.

Mounting hardware and standard line and load terminals are included on ratings through 250A. For 400 – 1600A ratings, order the lugs separately.

All ratings are UL listed and CSA certified.

Molded Case Switch

Maximum Ampere Rating / Frame	2-Pole	3-Pole	Short-Circuit Current Rating ^①			Self Protective Instantaneous Override
	Catalog Number	Catalog Number	240V	480V	600V	
150A / DG	HDR2S150L	HDR3S150L	100k	65k	20k	2,500A
250A / FG	HFS2S250L	HFS3S250L	100k	65k	20k	3,500A
400A / JG	HJS2S400	HJS3S400	100k	65k	25k	4,400A
600A / LG	HLR2S600	HLR3S600	100k	65k	18k	5,500A
800A / MG	HMS2S800	HMS3S800	100k	65k	35k	6,500A
1200A / NG	HNS2S120	HNS3S120	100k	65k	35k	12,000A
1600A / PG	—	HPS3S160	100k	65k	35k	14,000A

Maximum Ampere Rating / Frame	3-Pole	Short-Circuit Current Rating ^①			Self Protective Instantaneous Override
	Catalog Number	240V	480V	600V	
250A / FG	LFS3S250L	200k	100k	25k	3,500A
400A / JG	LJS3S400	200k	100k	25k	4,400A
600A / LG	LLR3S600	200k	100k	18k	5,500A
800A / MG	LMS3S800	200k	100k	65k	6,500A
1200A / NG	LNS3S120	200k	100k	65k	12,000A
1600A / PG	LPS3S160	200k	100k	65k	14,000A

①The Short-Circuit Current Rating is the maximum available current of the circuit where the switch is used, when protected by an appropriate overcurrent protective device.

VL Molded Case Circuit Breakers

Motor Circuit Protectors

Selection

General

Protection of Motor Circuits

Molded case circuit breakers are used in motor circuits as a disconnecting means and for short-circuit protection. They should be used in conjunction with motor-running, over-current protection devices, and should permit the motor to start without nuisance tripping from motor-inrush current. The circuit breaker should have a continuous current rating of not less than 115% of the motor full-load current.

The recommended motor circuit protectors listed have continuous-current ratings of at least 115% of motor full-load currents. The trip setting positions are approximately 11 times motor full-load current. The suggested trip settings may need to be adjusted upward to no higher than 1300% of full-load current for non-design E type motors, and no greater than 1700% of full-load current for design E motors, to allow for motor startup due to in-rush current.

Breaker Mounted Immediately Ahead of Motor Starter

Siemens motor circuit protectors are recommended for use in combination motor starters to provide selective short-circuit protection for the motor branch circuit. The adjustable instantaneous trip feature of the Siemens motor circuit protector provides for a trip setting slightly above the peak motor in-rush current. With this setting, no delay is introduced in opening the circuit when a fault occurs. This circuit breaker has no time-delay trip element. Therefore it must be used in conjunction with, and immediately ahead of, the motor-running overcurrent protection device.

Important: The information below does not apply to all motor applications: it is recommended that the user refer to the National Electrical Code (NEC) for specific needs.

Table 1 (When Breaker is Mounted Immediately Ahead of Motor Starter)

3-Phase Induction Type Motors (Siemens motor circuit protectors for branch circuit use with alternating-current combination, full voltage motor starters)

Motor Full Load Amperes	Trip Setting (A)	Catalog Number ^①
35-50	450	HDP3L150L
42-60	540	
48-70	630	
55-80	720	
62-90	810	
69-100	900	
58-83	750	HDP3M150L
69-100	900	
81-117	1050	
92-133	1200	
104-150	1350	
115-150 ^②	1500	
96-139	1250	HDP3H150L
115-150 ^②	1500	
135-150 ^②	1750	
135-150 ^②	2000	
135-150 ^②	2250	
135-150 ^②	2500	
46-67	600	HFM3L250L
55-80	720	
65-93	840	
74-107	960	
83-120	1080	
92-133	1200	
77-111	1000	HFM3M250L
92-133	1200	
108-156	1400	
123-178	1600	
138-200	1800	
154-222	2000	
135-194	1750	HFM3H250L
162-210	2100	
188-220	2450	
215-241	2800	
242-250 ^②	3150	
242-250 ^②	3500	

Motor Full Load Amperes	Trip Setting (A)	Catalog Number ^①
96-139	1250	HJM3L400
115-167	1500	
135-194	1750	
154-222	2000	
173-250	2250	
192-278	2500	
154-222	2000	HJM3M400
185-267	2400	
215-311	2800	
246-356	3200	
277-400	3600	
308-400 ^②	4000	
154-222	2000	HLM3J600
185-267	2400	
215-311	2800	
246-356	3200	
277-400	3600	
308-444	4000	
212-306	2750	HLM3Y600
254-367	3300	
296-428	3850	
338-489	4400	
381-550	4950	
423-600	5500	
250-361	3250	HMM3M800
292-422	3800	
335-483	4350	
385-556	5000	
442-638	5740	
500-722	6500	
385-556	5000	HNM3M120
462-667	6000	
538-778	7000	
615-889	8000	
692-1000	9000	
769-1111	10,000	

① Motor circuit protectors rated 150A and 250A are supplied with line and load lugs installed. If lugs are required on 400A to 1200A motor circuit breakers, order required lugs separately.

② These settings are provided for starting currents greater than 11X but not to exceed 17X. Full Load Amps (FLA) not to exceed ampere rating of MCP.

VL Molded Case Circuit Breakers

600 Volt DC Circuit Breakers

Selection

General

Siemens UL Listed non-interchangeable trip DC Thermal/magnetic Molded Case Circuit Breakers shown below are for use in grounded & ungrounded general DC circuits and ungrounded battery supply circuits of UPS systems. These breakers are rated at 600Vdc closed circuit and feature rated interruption levels from 42,000 to 65,000 amperes as indicated in

the table. This family of circuit breakers is rated from 50 to 1600 Amperes.

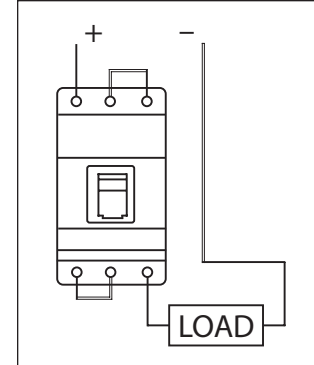
Types HDGD through HPGD circuit breakers are provided with an adjustable magnetic over-current function located on the face of the circuit breaker. Contact Siemens for specific magnetic over-current values.

To properly use these UL Listed circuit breakers at 600Vdc and the indicated

interruption level, it is necessary to connect the terminals of the 3 pole circuit breaker in a series configuration as shown in the diagram below.

Types HDGD through HPGD use the same internal and external accessories as the standard DG through PG frames and associated types. Consult the individual frame section for accessory information.

Frame	Type	Continuous Ampere Rating	Catalog Number (3-pole) ^①	Short-Circuit Current Rating 600VDC ^②
DG	HDGD	50	HDC3B050	42K
		60	HDC3B060	42K
		70	HDC3B070	42K
		80	HDC3B080	42K
		90	HDC3B090	42K
		100	HDC3B100	42K
		110	HDC3B110	42K
		125	HDC3B125	42K
		150	HDC3B150	42K
FG	HFGD	100	HFC3B100	42K
		150	HFC3B150	42K
		250	HFC3B250	42K
JG	HJGD	250	HJC3B250	65K
		300	HJC3B300	65K
		350	HJC3B350	65K
		400	HJC3B400	65K
LG	HLGD	400	HLC3B400	65K
		600	HLC3B600	65K
MG	HMGD	600	HMC3B600	65K
		700	HMC3B700	65K
		800	HMC3B800	65K
NG	HNGD	800	HNC3B800	65K
		900	HNC3B900	65K
		1000	HNC3B100	65K
		1200	HNC3B120	65K
PG	HPCD	1200	HPC3B120	65K
		1400	HPC3B140	65K
		1600	HPC3B160	65K

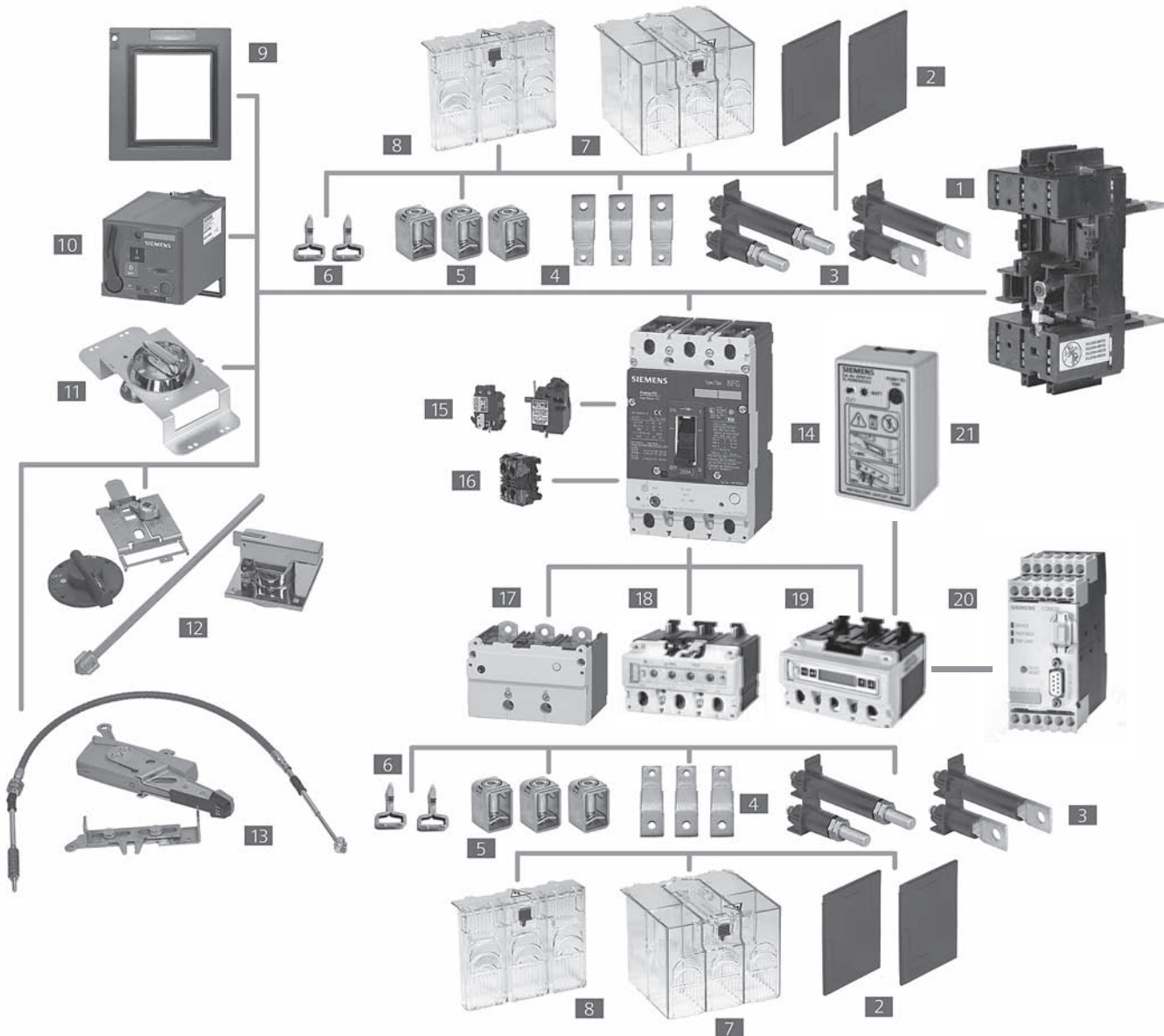


^① Terminal connectors must be ordered separately; see page 17/90.

^② Standard VL breakers DG - PG feature DC ratings up to 500V for ungrounded UPS applications. Consult the individual frame section for more information.

Modularity To Support All Your Application Needs

Modules and More: VL Circuit Breakers with Optional Accessories

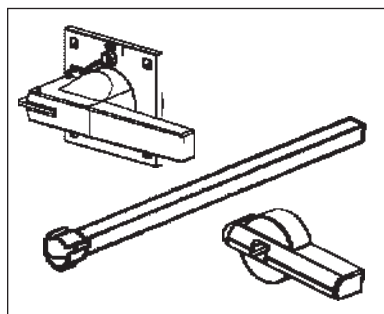
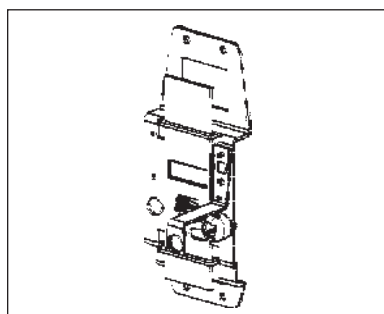
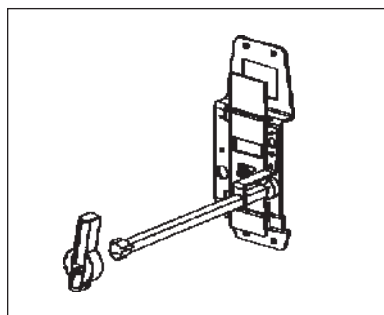
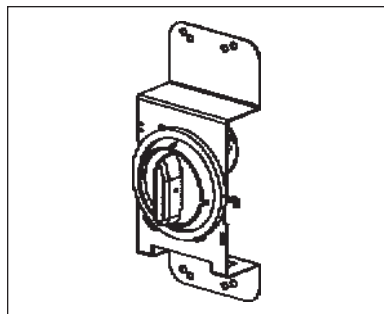


- | | | |
|-----------------------------------|--|---|
| 1 Base for Plug-In or Draw-Out | 9 Cover Frame for Door Cutout | 17 Thermal Magnetic Trip Unit (525) |
| 2 Interphase Barriers | 10 Stored Energy Operator | 18 Electronic Trip Unit (555) |
| 3 Rear Terminals – Flat and Round | 11 Rotary Handle Operator | 19 Elec. Trip Unit with LCD (586) |
| 4 Bus Extensions | 12 Variable Depth Rotary Operator | 20 Communication Module with ZSI |
| 5 Terminal Connectors | 13 Max Flex Operator | 21 Electronic Trip Unit Tester and LCD Power Supply |
| 6 Plug-In Terminal Blades | 14 Circuit Breaker | |
| 7 Extended Terminal Shield | 15 Shunt Trip or Undervoltage Releases | |
| 8 Standard Terminal Shield | 16 Auxiliary/Alarm Switches | |

VL Molded Case Circuit Breakers

Operating Mechanisms

Selection



Description	For DG to FG Frame 150 to 250 A		For JG to LG Frame 400 A to 600 A	
	Catalog Number		Catalog Number	
Through-Door Rotary Handle Operator Kit Fixed depth and the handle is mounted directly on the circuit breaker. Lockable knob (for up to 3 padlocks). NEMA 1, 12 Red Handle Version with red knob, yellow indicator plate NEMA 1, 12	RHFF		RHFL	
	RHFFEM		RHFLEM	
Door-Mounted Rotary Handle Operator Kit Variable depth, door mounted handle. Includes knob with masking frame, indicator plate, detachable door coupling, 12" shaft, and breaker mounted rotary operator. Lockable knob (for up to 3 padlocks). NEMA 1, 12	RHVF12		RHVL12	
Auxiliary Switch Kits For Direct or Extended Rotary Handle Operators (RHF and RHV). Form C, Early Break type2 Aux. Switch Kit® Includes 1 switch with 5' wire For Door-Mounted Operator For Through-Door Operator Includes 2 switches with 5' wire For Door-Mounted Operator For Through-Door Operator	—	—	RHSLA1	RHSLA1F
	RHSFA1F	—	RHSLA2	RHSLA2F
Door-Mounted Rotary Operator Mechanism Breaker mechanism only	RHVFBM		RHVLBM	
Door-Mounted Rotary Handle Only Standard version NEMA 1, 12 NEMA 3R NEMA 4X Red Handle version	RHVM12H RHVM3RH RHVM4XH RHVMEMH		RHVM12H RHVM3RH RHVM4XH RHVMEMH	
NFPA-79 Handle Kit Intermediate handle for NFPA-79 compliance with door-mounted rotary operator	RHVF79H		RHVM79H	
Extension Shaft Only, for Door Mounted Operator 2 inches (50.8mm) 3 inches (76.2mm) 12 inches (304.8 mm) 16 inches (406.4 mm) 24 inches (609.6mm) w/ support bracket	RHVMS02	—	RHVMS02	—
	RHVMS12	—	RHVMS12	—
	RHVMS16	—	RHVMS16	—
	RHVMS24	—	RHVMS24	—

© During manual operation, Early Break auxiliary switch contacts open before the breaker opens.

VL Molded Case Circuit Breakers

Operating Mechanisms

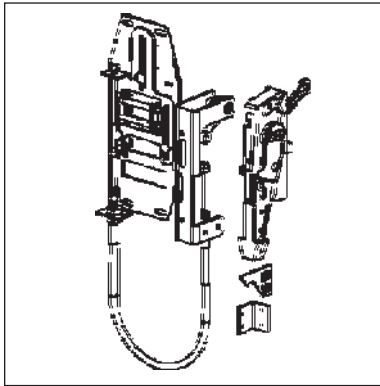
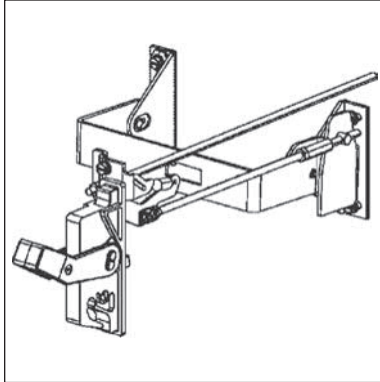
Selection

Description	For MG Frame 800 A	For NG to PG Frame 1200 to 1600 A	
	Catalog Number	Catalog Number	
Through-Door Rotary Handle Operator Kit Fixed depth, breaker mounted. For direct fitting to the circuit breaker. Lockable with up to 3 padlocks. NEMA 1, 12	RHFM —	—	—
Red Handle version with red knob, yellow indicator plate NEMA 1, 12	— —	—	—
Door-Mounted Rotary Handle Operator Kit Variable depth, door mounted handle. Includes knob with masking frame, indicator plate, detachable door coupling, 12" shaft, and breaker mounted rotary operator. Lockable knob (for up to 3 padlocks). NEMA 1, 12	RHVM12	—	—
Auxiliary Switch Kits For Direct or Extended Rotary Handle Operators (RHF and RHV). Early Break type2 Aux. Switch Kit Includes 1 switch with 5' wire For Door-Mounted Operator For Through-Door Operator	RHSMA1 —	RHSPA1 —	—
Includes 2 switches with 5' wire For Door-Mounted Operator For Through-Door Operator	RHSMA2 —	RHSPA2 —	—
Door-Mounted Rotary Operator Mechanism Breaker mechanism only	RHVMBM	RHVPBM	
Door-Mounted Rotary Handle Only Standard version NEMA 1, 12 NEMA 3R NEMA 4X Red Handle version	RHVM12H RHVM3RH RHVM4XH RHVMEH	RHVP3RH RHVP3RH RHVP4XH RHVPEH	
NFPA-79 Handle Kit Intermediate handle for NFPA-79 compliance with door-mounted rotary operator	RHVM79H	RHVP79H	
Extension Shaft Only, for Door Mounted Operator 2 inches (50.8mm) 3 inches (76.2mm) 12 inches (304.8 mm) 16 inches (406.4 mm) 24 inches (609.6mm) w/ support bracket	RHVMS02 — RHVMS12 RHVMS16 RHVMS24	— RHVPS03 RHVPS12 — RHVPS24	— — — —

VL Molded Case Circuit Breakers

Operating Mechanisms

Selection



Description	For DG and FG Frame 150 to 250 A	For JG and LG Frame 400 to 600 A
	Catalog Number	Catalog Number
Variable Depth Flange Mounted Operator Kit Adjustable from 8" to 16" Complete kit, includes handle and variable depth operator. IEC Black Handle NEMA 1, 3R, 12 NEMA 4X NEMA 1, 3R, 12 NEMA 4X	FHVF3R FHVF4X FHV3RB FHV4XB	FHV3R FHV4X FHV3RB FHV4XB
Max-Flex™, Variable Depth Flange Mounted Operator Kit Complete kit, includes plastic handle, breaker operator, and cable. NEMA 1, 3R, 12 For DG and FG operators, the cable is 36", all others are 48" May be right- or left-hand mounted	MFKF3R	MFKL3R
Handle Only, for Max-Flex™ Variable Depth NEMA 1, 3R, 12 Plastic NEMA 1, 3R, 12 Steel - epoxy coated NEMA 4, 4X Steel - chrome plated Solid color (all gray) Plastic ^① NEMA 1, 3R, 12 Solid color (black handle) Steel epoxy coated ^① NEMA 1, 3R, 12	MFHM3R MFHM3RS MFHM4X MFHM3RB MFHM3RSB	MFHM3R MFHM3RS MFHM4X MFHM3RB MFHM3RSB
Breaker Operator Mechanism Only, for Max-Flex™	MFMF	MFML
Cable Only, for Max-Flex™ Variable Depth 36" 48" 60" 72" 84" 96" 120" 144"	MFCF036 MFCF048 MFCF060 MFCF072 MFCF084 MFCF096 MFCF120 MFCF144	MFCM036 MFCM048 MFCM060 MFCM072 MFCM084 MFCM096 MFCM120 MFCM144
Handle Auxiliary Switch Form C (1NO - 1NC), early break ^② 1 Aux. switch 2 Aux. switch	MFSFA1 MFSFA2	MFSLA1 MFSLA2

① Max-Flex™ handles are available with solid gray or black handles instead of the customary "Red for On" flange handle. The black handle is preferred for IEC markets, where red handles have a specific meaning.
 ② During manual operation, Early Break aux. contacts open before the breaker opens.

VL Molded Case Circuit Breakers

Operating Mechanisms

Selection

Description	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
	Catalog Number	Catalog Number	Catalog Number
Variable Depth Flange Mounted Operator Kit Adjustable from 8" to 16" Complete kit, includes handle and variable depth operator.			
NEMA 1, 3R, 12	—	—	
NEMA 4X	—	—	
IEC Black Handle	—	—	
NEMA 1, 3R, 12	—	—	
NEMA 4X	—	—	
Max-Flex™, Variable Depth Flange Mounted Operator Kit Complete kit, includes plastic handle, breaker operator, and cable. NEMA 1, 3R, 12 For DG and FG operators, the cable is 36", all others are 48" May be right- or left-hand mounted	MFKM3R	MFKP3RS	MFKP3RS
Handle Only, for Max-Flex™ Variable Depth NEMA 1, 3R, 12 Plastic NEMA 1, 3R, 12 Steel - epoxy coated NEMA 4, 4X Steel - chrome plated Solid color (all gray) Plastic ^① NEMA 1, 3R, 12 Solid color (black handle) Steel epoxy coated ^① NEMA 1, 3R, 12	MFHM3R MFHM3RS MFHM4X MFHM3RB MFHM3RSB	— MFHP3RS MFHP4X — MFHP3RSB	— MFHP3RS MFHP4X — MFHP3RSB
Breaker Operator Mechanism Only, for Max-Flex™	MFMM	MFMP	MFMP
Cable Only, for Max-Flex™ Variable Depth 36" 48" 60" 72" 84" 96" 120" 144"	MFCM036 MFCM048 MFCM060 MFCM072 MFCM084 MFCM096 MFCM120 MFCM144	— MFCP048 MFCP060 MFCP072 MFCP084 MFCP096 MFCP120 MFCP144	— MFCP048 MFCP060 MFCP072 MFCP084 MFCP096 MFCP120 MFCP144
Handle Auxiliary Switch Form C (1NO - 1NC), early break ^② 1 Aux. switch 2 Aux. switch	MFSPA1 MFSPA2	MFSPA1 MFSPA2	MFSPA1 MFSPA2

① Max-Flex™ handles are available with solid gray or black handles instead of the customary "Red for On" flange handle.

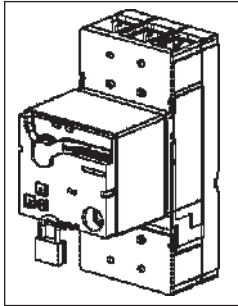
The black handle is preferred for IEC markets, where red handles have a specific meaning.

② During manual operation, Early Break aux. contacts open before the breaker opens.

VL Molded Case Circuit Breakers

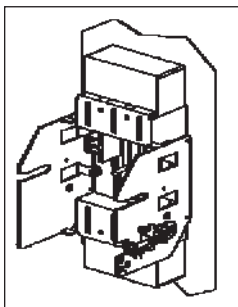
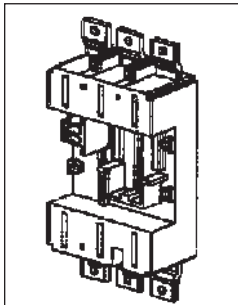
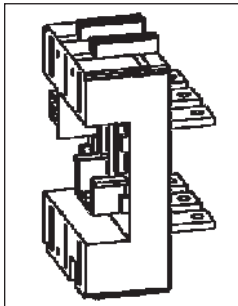
Operating Mechanisms

Selection



		For DG to FG Frame 150 to 250 A	
Description		Catalog Number	
Stored Energy and Motor Operators			
Lockable with up to 3 padlocks.			
AC Voltage	DC Voltage	Stored Energy Type	
—	24	SEAFB	
42-48	42-48	SEAFM	
60	60	SEAFY	
110-127	110-127	SEAFN	
220-250	220-250	SEAFR	
Cylinder Locks for Field Installation		CLKF	

Plug-In and Draw-Out Bases



Description	For DG Frame 150 A	For FG Frame 250 A
	Catalog Number	Catalog Number
Plug-in Mounting Base Assembly Includes base, terminal blade kit, sec. terminal block assembly, base trip interlock, and mounting hardware. Rear Connected 3-pole Front Connected 3-pole	PCBDRC3 PCBDFC3	PCBFRC3 PCBFFC3
Draw-out Assembly Includes base, position indicator switch, socket, base trip interlock, crank handle, connectors, and necessary shields. Rear Connected 3-pole Front Connected 3-pole (Draw-out assembly includes side plates and all hardware)	DCADRC3 DCADFC3	DCAFRC3 DCAFFC3
Hex Wrench for racking draw-out assembly and position indicator	DCHP	DCHP
Position Indicator Switch Form "C" switch to indicate breaker engaged/de-engaged position. ^①	DCIP	DCIP
Secondary Terminal Block Assy. Accessory connections for plug-in or draw-out breakers. Pre-wired plug and block with 8 terminal points. ^②	PCTF83	PCTF83
Plug-In Spare Breaker Kit Set of 6 terminal blades, 2 terminal shield, & 1 trip interlock	PCXD3	PCXF3
Draw-out Spare Breaker Kit Set of 6 terminal blades, & 1 trip interlock	DCXD3	DCXF3
Spare Breaker Trip Interlock	PCXFT	PCXFT

① Up to 2 position indicator switches may be mounted per plug-in or draw-out base.

② Up to 2 plugs per breaker (16 terminal points) may be mounted on DG, and FG breakers. Up to 3 plugs per breaker (24 terminal points) may be mounted on JG, LG, MG, NG, and PG breakers.

VL Molded Case Circuit Breakers

Operating Mechanisms

Selection

For JG to LG Frame
400 to 600 A

For MG Frame
800 A

For NG to PG Frame
1200 to 1600 A

Catalog Number

Catalog Number

Catalog Number

Stored Energy Type

SEALB
SEALM
SEALY
SEALN
SEALR
CLKP

Stored Energy Type

SEAMB
SEAMM
SEAMY
SEAMN
SEAMR
CLKP

Motor Operator Type

MTRPB
MTRPM
MTRPY
MTRPN
MTRPR
CLKP

For JG Frame
400 A

For LG Frame
600 A

For MG Frame
800 A

For NG Frame
1200 A

For PG Frame
1600 A

Catalog Number

Catalog Number

Catalog Number

Catalog Number

Catalog Number

PCBJRC3

PCBLRC3

PCBMRC3

PCBNRC3

—

PCBJFC3

PCBLFC3

—

—

—

DCAJRC3

DCALRC3

DCAMRC3

DCANRC3

—

DCAJFC3

DCALFC3

DCAMFC3

DCANFC3

—

DCHP

DCHP

DCHP

DCHP

—

DCIP

DCIP

DCIP

DCIP

—

PCTL83

PCTL83

PCTM83

PCTN83

—

PCXJ3

PCXL3

PCXM3

PCXN3

—

DCXJ3

DCXL3

DCXM3

DCXN3

—

PCXLT

PCXLT

PCXMT

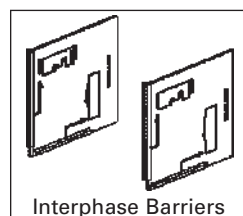
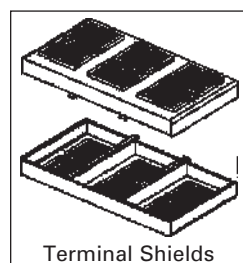
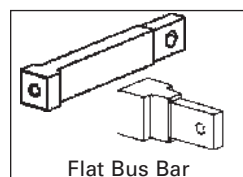
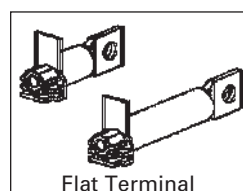
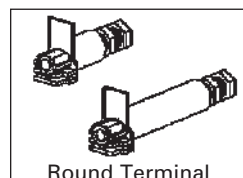
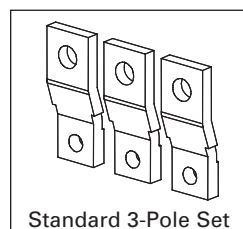
PCXPT

—

VL Molded Case Circuit Breakers

Connections

Selection



	For DG Frame 150 A	For FG Frame 250 A
Description	Catalog Number	Catalog Number
Front Bus Bar Connections Includes nut keeper plates and shield. Standard (straight) 3-Pole Set Bus Bar Connection Strap Kit Includes 6 - Bus Bars, 6 Nut Keepers & Shields 100% rated applications	FBCD3 — —	FBCF3 — —
Rear-Connecting Studs Short length round term. (1piece) Long length round term. (1piece) 3-Pole round term. kit, 2 short + 1 long Short length flat term. (1piece) Long length flat term. (1piece) 3-Pole flat term. kit, 2 short + 1 long Flat bus bar type (1 piece) 3-Pole set of flat bus bar	RTLDSR RTLDLR SRTDR3 RTLDSF RTLDLF SRTDF3 — —	RTLFSR RTLFLR SRTFR3 RTLFSF RTLFLF SRTFF3 — —
Terminal Shields Includes 2 terminal shields. 3-Pole Standard Shield 3-Pole Extended Shield	TSSF3 TSLF3	TSSF3 TSLF3
Interphase Barriers Set of 2 barriers Also fits plug-in and draw-out bases.	IPBF	IPBF
Lug Mounting Assy.	—	—
Breaker Mounting Base Front connected Rear connected	— —	— —

VL Molded Case Circuit Breakers

Connections

Selection

For JG Frame 400 A	For LG Frame 600 A	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
FBCJ3 —	FBCL3 —	FBCM3 —	SSBP SSBPH	SSBP SSBPH
RTLJSR RTLJLR SRTJR3 RTLJSF RTLJLF SRTJF3 — —	— — — — — — RTLLSF SRTL3F	— — — — — — RTLMSF SRTMF3	— — — — — — RTLNSF SRTNF3	— — — — — — — —
TSSL3 TSLL3	TSSL3 ^① TSLL3 ^①	TSSM3 TSLM3	TSSP3 TSLP3	TSSP3 TSLP3
IPBM	IPBM	IPBM	IPBP	IPBP
—	—	—	—	LMAP1600 ^②
— —	— —	— —	— —	MBPG1600 MBPG1601

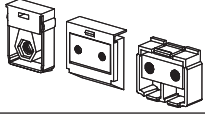







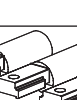


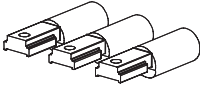
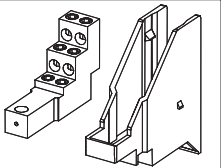
① Not for use with standard AI terminals. Use Standard Shield for rear connection and Extended Shield for bus-bar connection.

② Kit includes connection for one side of breaker only. Order quantity 2 if connecting line and load side.

VL Molded Case Circuit Breakers

Connections

Selection

		For DG Frame 150 A	For FG Frame 250 A
	Description	Catalog Number	Catalog Number
	Nut Keeper Plates For ring/tongue terminal or bus bar connections. (For metric threads on other than the JG frame, change "TNK" to "TMK") 1 Nut Keeper Plate Kit of 3	TNKD TNKD3	TNKF TNKF3
			
	Mechanical Lugs <i>Steel Wrap Around Body (Cu Wire Only)</i> Cable Size; (cables per phase) Single Lug Kit of 3	#8-1/0; 1-hole TW1DG20 3TW1DG20	#4-350 kcmil; 1-hole TW1FG350 3TW1FG350
	Aluminum Body (Al or Cu Wire) Cable Size; (cables per phase) Single Lug Kit of 2	#6-3/0; 1-hole TA1DG30 —	#4-350 kcmil; 1-hole TAW1FG350 —
	Kit of 3	3TA1DG30	3TAW1FG350
	Cable Size; (cables per phase)	—	—
	Single Lug Kit of 2 Kit of 3	— — —	— — —
	Cable Size; (cables per phase) Single Lug	— —	— —
	Copper Body (Cu Wire Only) Cable Size; (cables per phase) Single Lug Kit of 2	#6-3/0; 1-hole TC1DG30^① —	#4-350 kcmil; 1-hole TCW1FG350^① —
	Kit of 3	3TC1DG30^①	3TCW1FG350^①
	Cable Size; (cables per phase) Single Lug	— —	— —
	Compression Lugs Cable Size; (cables per phase) Kit of 2 Kit of 3	#14-2/0; 1-cable 2CLD20 3CLD20	#4-350 kcmil; 1-cable — 3CLF350
	Cable Size; (cables per phase) Kit of 2 Kit of 3	— — —	— — —
	Cable Size; (cables per phase) Kit of 3	— —	— —
	Distribution Lugs (Cu Wire Only) Cable Size; (cables per phase) Single Lug Kit of 3 Cable Size; (cables per phase) Single Lug Kit of 3	#14-#2; 3-hole TA3DG02 3TA3DG02 #14-#4; 6-hole TA6DG04 3TA6DG04	#14-#1; 2-hole and #14-2/0; 1-hole TA3FG20 3TA3FG20 #14-#4; 6-hole TA6FG04 3TA6FG04
	Control Wire Terminals Control Wire Terminal (Single) Control Wire Terminal (Kit of 3)	— —	— —

Note: pictures provide graphical representations only.

① Required for 100% rated breakers. Requires 90°C cable sized at 75°C ampacity.

VL Molded Case Circuit Breakers

Connections

Selection

For JG Frame 400 A	For LG Frame 600 A	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
TMKJ TMKJ3 <i>metric only</i>	TNKL TNKL3	TNKM TNKM3	TNKP TNKP3	TNKP TNKP3
1/0-600 kcmil; 1-hole TW1JG600 3TW1JG600	— — —	— — —	— — —	— — —
3/0-250 kcmil; 2-hole TA2JG250 — 3TA2JG250 AL: 250-750 kcmil CU: 3/0-600 kcmil; 1-hole TA1JG750 — 3TA1JG750 — — —	#2-600 kcmil; 2-hole — — — 3TA2LG600LD ^① 3TA2LG600LN ^② AL: 250-750 kcmil CU: 3/0-600 kcmil; 1-hole TA1JG750 (400A max) — 3TA1JG750 (400A max) — — —	1/0-500 kcmil; 3-hole TA3MG500 3TA3MG500 500 -750 kcmil; 2-hole TA2MG750 — 3TA2MG750 #2-600 kcmil; 3-hole — — 3TA3MG600 ^③ (Kit of 3)	1/0-500 kcmil; 4-hole — 2TA4NG500 3TA4NG500 3TA4NG500H ^③ 500 -750 kcmil; 3-hole — 2TA3NG750 3TA3NG750 —	1/0-750 kcmil; 6-hole — — 3TA6PG750 ^③ 600-750 kcmil; 4-hole TA4P750 ^④ — 300-600 kcmil; 5; 6-hole TA5P600 ^⑤ TA6R600 ^⑤ —
3/0-250 kcmil; 2-hole TC2JG250 ^③ — — 3/0-750 kcmil; 1-hole TC1JG750 ^③	#2-600 kcmil; 2-hole — — — 3TC2LG600LD ^{①③} 3TC2LG600LN ^{②③} — —	1/0-500 kcmil; 3-hole TC3MG500 ^③ — — — —	1/0-500 kcmil; 4-hole — — — 3TC4NG500 ^③ — —	— — — — 300-600 kcmil; 5-hole TC5R600 ^{③④}
#6-350 kcmil; 1-cable — 3CLJ350 250-600 kcmil; 1-cable 3CLJ600 — 250-750 kcmil; 1-cable 3CLJG750 —	#6-350 kcmil; 2-cable 6CLL350 (kit of 6) 250-750 kcmil; 1-cable 3CLL750 — 250-600 kcmil; 2-cable 6CLL600 (kit of 6) —	— — — — — —	1/0-500 kcmil; 4-cable — 12CLN500 (kit of 12) — — — — —	— — — — — — — —
#14-#4; 12-hole TA12JG04 3TA12JG04 #14-2/0; 6-hole TA6JG20 3TA6JG20	— — — — —	— — — — —	— — — — —	— — — — —
TA2JG250PT —	— 3TA2LG600LNPT	TA3MG500PT —	— 3TA4NG500PT	— —

All lug kits include the nut keepers.

① Mounted on Load Side Only.

② Mounted on Line Side Only.

③ Required for 100% rated breakers. Requires 90°C cable

sized at 75°C ampacity.

④ Requires extended modified shield.

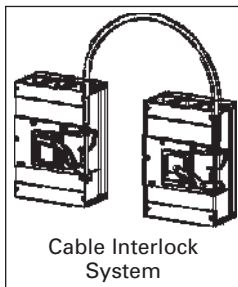
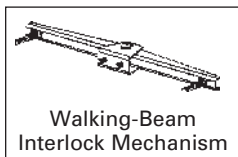
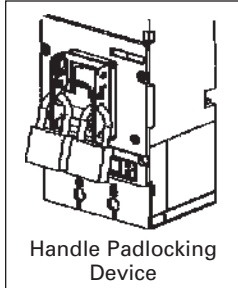
⑤ Used only with LMAP1600 mounting base.

⑥ Used only with MBPG1600 or MBPG1601 mounting base.

VL Molded Case Circuit Breakers

General

Selection



Description	For DG Frame 150 A	For FG Frame 250 A
	Catalog Number	Catalog Number
Handle Padlocking Device To padlock breaker toggle in the "OFF" position. Accepts up to 3 padlocks with 5–8 mm shackles.	HPLF	HPLF
Handle Blocking Device For holding the handle in the "ON" position. Not a lockout/tagout device.	HBDF	HBDF
Walking-Beam Interlock Mechanism Provides mechanical interlocking between two adjacent circuit breakers. Fixed mounted breakers	WBMFFM	WBMFFM
Note: Both breakers must be of the same frame size.		
Cable Interlock Mechanism Provides mechanical interlocking between 2 circuit-breakers - includes operator mechanism for one circuit breaker only. Combination with the next larger or smaller frame size is possible.	CBTF	CBTF
Interlock Cable Cable only, to connect 2 circuit breakers. Cable length 18 in. .46m (recommended up to 250A) Cable length 36 in. .91m (recommended from 400–800A) Cable length 54 in. 1.37m (recommended from 1200–1600A)	CBCF18 CBCM36 CBCP54	CBCF18 CBCM36 CBCP54
Mounting Screw Kit Includes the necessary hardware to mount a circuit breaker to the user's prepared surface Kit with 2 screws (SAE thread) Kit with 4 screws (SAE thread)	MSKF2 MSKF4	MSKF2 MSKF4
Trip Adjustment Sealing Cover Includes a trip unit cover to prevent tampering or adjustment of trip settings. Seal not included. Thermal-Magnetic Trip Units	TSCFTM	TSCFTM

VL Molded Case Circuit Breakers

General

Selection

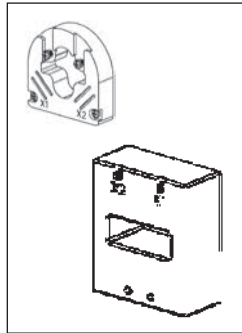
For JG Frame 400 A	For LG Frame 600 A	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
HPLL	HPLL	HPLM	HPLP	HPLP
HBDL	HBDL	HBDM	HBDP	HBDP
WBMLFM	WBMLFM	WBMMFM	WBMPFM	WBMPFM
CBTL	CBTL	CBTM	CBTP	CBTP
— CBCM36 CBCP54	— CBCM36 CBCP54	— CBCM36 CBCP54	— — CBCP54	— — CBCP54
— MSKL4	— MSKL4	— MSKM4	— MSKP4	— MSKP4
TSCLTM	TSCLTM	TSCMTM	—	—

- 1
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- 16
- 17

VL Molded Case Circuit Breakers

Ground Sensors & Electronic Accessories

Selection



Description

Neutral Current Transformer (Ground Sensor, N-pole)

Neutral = 35/60A
 Neutral = 100A
 Neutral = 150A
 Neutral = 250A
 Neutral = 400A
 Neutral = 600A
 Neutral = 800A
 Neutral = 1000/1200A
 Neutral = 1600A

For DG Frame
150 A

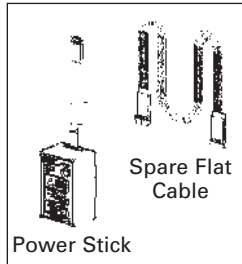
Catalog Number

NGSD060
 NGSF100
 NGSF150
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For FG Frame
250 A

Catalog Number

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 NGSF100
 NGSF150
 NGSJ250
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Power Stick

Communications & Electronics

Power Stick - Hand held, battery operated power supply for LCD trip units. (Requires two 9V batteries.) Trip testing for both 555 & 586 trip units.

Spare flat cable for Power Stick.

COM20 Profibus Communications Module with ZSI for electronic trip units (order cable separately)

COM21 Modbus Communications Module with ZSI for electronic trip units (order cable separately)

Cable for COM20/21, 1.5 m (4.9 ft)

Cable for COM20/21, 3.0 m (9.8 ft)

Addressing Plug - assigns a field bus address without a PC by plugging into COM20/21

EPSP18V

COMPCA

COMPRO20

COMMOD21

COMKIT3

COMKIT6

3UF79100AA000

EPSP18V

COMPCA

COMPRO20

COMMOD21

COMKIT3

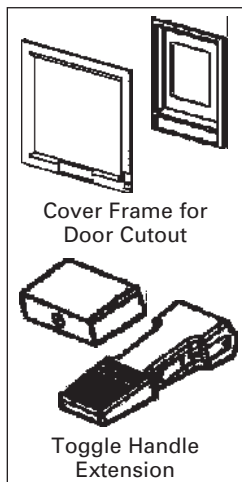
COMKIT6

3UF79100AA000



Com20 Profibus & Com21 Modbus Communications Module

Door Cutouts & Extensions



Cover Frame for Door Cutout

Toggle Handle Extension

Cover Frame for Door Cutout

For fixed or plug-in mounted circuit breakers. (IP30)
 2-Pole & 3-Pole

BZLF3

BZLF3

For breakers with stored energy operator. (IP40)

BZLFRHSE

BZLFRHSE

Circuit-breaker draw-out mounted and toggle handle operated. Kit includes cover frame (bezel) and escutcheon as needed. (IP40) (not for use with rotary handle or stored energy operator)

BZLFBDC

BZLFBDC

Toggle Handle Extension

For spare or replacement. (One is included with each NG - PG frame.)

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VL Molded Case Circuit Breakers

Ground Sensors & Electronic Accessories

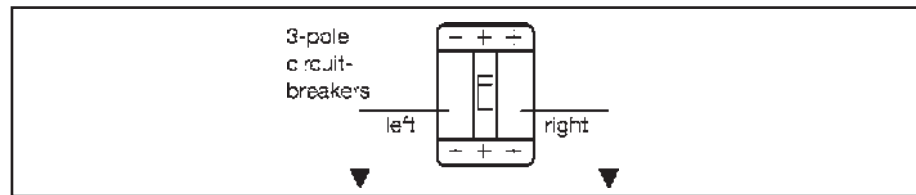
Selection

For JG Frame 400 A	For LG Frame 600 A	For MG Frame 800 A	For NG Frame 1200 A	For PG Frame 1600 A
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
— — — NGSJ250 NGSL400 — — —	— — — — NGSL400 NGSM600 — — —	— — — — — NGSM600 NGSN800 — —	— — — — — — NGSN800 NGSP120 —	— — — — — — — NGSP120 NGSP160
EPSP18V	EPSP18V	EPSP18V	EPSP18V	EPSP18V
COMPCA	COMPCA	COMPCA	COMPCA	COMPCA
COMPRO20	COMPRO20	COMPRO20	COMPRO20	COMPRO20
COMMOD21	COMMOD21	COMMOD21	COMMOD21	COMMOD21
COMKIT4	COMKIT4	COMKIT5	COMKIT5	COMKIT5
COMKIT7	COMKIT7	COMKIT8	COMKIT8	COMKIT8
3UF79100AA000	3UF79100AA000	3UF79100AA000	3UF79100AA000	3UF79100AA000
BZLL3	BZLL3	BZLM3	BZLP3	BZLP3
BZLLRHSE	BZLLRHSE	BZLMRHSE	BZLPRHSE	BZLPRHSE
BZLLBDC	BZLLBDC	BZLMBDC	BZLPBDC	BZLPBDC
THEL	THEL	THEM	THEP	THEP

VL Molded Case Circuit Breakers

Accessory Locations

Selection



Locations of Internally Mounted Accessories

Frame Family	Left Pocket	Right Pocket
DG*, FG*, JG, LG 150 to 600A	Up to 3 Auxiliary Switches	Shunt Trip or UVR or up to 3 Auxiliary Switches or up to 2 Auxiliary Switches + 1 Alarm Switch
	Up to 2 Auxiliary Switches + 1 Alarm Switch	Shunt Trip or UVR or up to 3 Auxiliary Switches or up to 2 Auxiliary Switches + 1 Alarm Switch
MG, NG, PG 800 to 1600A	Up to 4 Auxiliary Switches	Shunt Trip or UVR or up to 4 Auxiliary Switches
	Up to 2 Auxiliary Switches + 2 Alarm Switches	Shunt Trip or UVR or up to 4 Auxiliary Switches

* Except DG and FG breakers with Electronic Trip Units. Due to the location of the Magnetic Latch, the Left Pocket is not available for accessories.

Accessory Information

- Aux. Switch is an Auxiliary Switch, 1A or 1B contact
- Alarm Switch has 1A or 1B contact
- UVR is an Undervoltage Release
- The standard location for factory mounted Auxiliary and Alarm Switches is the Left Pocket

Accessory Maximums

DG, FG, JG, LG Maximum Accessories:

- Maximum of six (6) switches total
- DG, FG Maximum of two (2) Alarm Switches, one each in the Left and Right Pockets. JG, LG Max. of 1 Alarm, Left only

MG, NG, PG Maximum Accessories:

- Maximum of eight (8) switches total
- Maximum of two (2) Alarm Switches, Left Pocket only

For applications using COMMOD20 and COMMOD21 for communication using Modbus or Profibus

DG, FG

COMKIT3 & COMKIT6 provide auxiliary contact kit. May add only one or two contact blocks for Alarm or Auxiliary function.

JG, LG

COMKIT4 & COMKIT7 provide auxiliary contact kit mounted in left pole pocket. One contact block can be added for Auxiliary function. Right pole pocket available for other release or an additional Auxiliary contact kit.

MG, NG, PG

COMKIT5 & COMKIT8 provide auxiliary contact kit mounted in Left pole pocket. Two contact blocks can be added for Auxiliary function and one for Alarm function. Right pole pocket available for other release or an additional Auxiliary Contact kit.

If the frame is:	And you need these functions:	Then add this suffix:	Device Catalog Number
DG, FG, JG or LG	1 Alarm Switch 1 NO Alarm 1 NC Alarm	A1	ASKL1
DG, FG, JG or LG	2 Aux. Switches 1 NO + 1 NC Aux. Contacts	A2	ASKL2
DG, FG, JG or LG	2 Aux. + 1 Alarm Switches 1NO + 1NC Aux. and 1NC Alarm 2NO Aux. and 1NC Alarm	A3	ASKL3
MG, NG or PG	2 Aux. + 2 Alarm Switches 1NO + 1NC Aux. and 1NO + 1NC Alarm 2NO Aux. and 2NC Alarm 2NC Aux. and 2NO Alarm	A3	ASKP3
MG, NG or PG	4 Aux. Switches 2NO + 2NC Aux.	A4	ASKP4

Suffix for factory mounted Shunt Trips

If the frame is:	And you need these functions:	Then add this suffix:	Device Catalog Number
DG, FG, JG or LG	24V DC 48-60V DC 110-127V DC 220-250V DC 48-60V AC 110-127V AC 208-277V AC 380-600V AC	RB RC RD RE RM RN RS RV	STRLB24DC STRLC60DC STRLD125DC STRLE250DC STRLM60 STRLN120 STRLS277 STRLV600
MG, NG or PG	24V DC 48-60V DC 110-127V DC 220-250V DC 48-60V AC 110-127V AC 208-277V AC 380-600V AC	RB RC RD RE RM RN RS RV	STRPB24DC STRPC60DC STRPD125DC STRPE250DC STRPM60 STRPN120 STRPS277 STRPV600

Suffix for factory mounted Undervoltage Releases

If the frame is:	And you need these functions:	Then add this suffix:	Device Catalog Number
DG, FG, JG or LG	12V DC 24V DC 48V DC 60V DC 110-127V DC 220-250V DC 24V AC 110-127V AC 220-240V AC 208V AC 277V AC 380-415V AC 440-480V AC	UA UB UC UG UD UE UL UN UR UP US UT UU	UVRLA12DC UVRLB24DC UVRLC48DC UVRLG60DC UVRLD125DC UVRLE250DC UVRLL24 UVRLN120 UVRLR240 UVRLP208 UVRLS277 UVRLT415 UVRLU480
MG, NG or PG	12V DC 24V DC 48V DC 60V DC 110-127V DC 220-250V DC 110-127V AC 220-240V AC 208V AC 277V AC 380-415V AC 440-480V AC	UA UB UC UG UD UE UN UR UP US UT UU	UVRPA12DC UVRPB24DC UVRPC48DC UVRPG60DC UVRPD125DC UVRPE250DC UVRPN120 UVRPR240 UVRPP208 UVRPS277 UVRPT415 UVRPU480

VL Molded Case Circuit Breakers

Technical Data

Selection

		DG	FG	JG	LG	MG	NG	PG
Max rated continuous current		150	250	400	600	800	1200	1600
Rated operational voltage								
NEMA	V AC	600	600	600	600	600	600	600
IEC	V AC	690	690	690	690	690	690	690
Rated Impulse Withstand Voltage								
Main conducting paths	kV	8	8	8	8	8	8	8
Auxiliary circuits	kV	4	4	4	4	4	4	4
Ambient Temperature Range	°C	-25 to +75	-25 to +75	-25 to +75	-25 to +75	-25 to +75	-25 to +75	-25 to +75
High Ambient Derating (thermal-mag.)	50°C	93%	93%	93%	93%	95%	95%	95%
	60°C	86%	86%	86%	86%	86%	86%	80%
	70°C	80%	80%	80%	80%	80%	80%	74%
Operating Cycles		20,000	20,000	20,000	10,000	5,000	3,000	3,000
Max switching rate (per hour)		120	120	120	60	60	30	30
Power loss (at max. rated current)								
Thermal-magnetic	W	15 – 48	32 – 80	60 – 175	85 – 230	170 – 250	150 – 220	200 – 260
Electronic trip unit	W	40	60	90	160	250	210	260
IEC ①								
Time constant t = 10 ms								
1 current path 2 current paths 3 current paths								
in series in series in series								
Up to 250V DC 440V DC 600V DC		—	—	—	—	—	—	—
NEMA								
Time constant t = 8 ms								
2 poles switching 1 current path								
250V DC Max. ②		30	30	30	30	42	42	42
3 poles switching 2 current paths in series								
500V DC Max. ②		18	25	35	35	65	65	65
Accessories								
Auxiliary/ Alarm Switch								
Current rating (1 or 2 switches)		10	10	10	10	10	10	10
Current rating (3 or 4 same switch)	A	5	5	5	5	5	5	5
Shunt Trip								
Pick-up voltage	V	0.7 – 1.1	0.7 – 1.1	0.7 – 1.1	0.7 – 1.1	0.7 – 1.1	0.7 – 1.1	0.7 – 1.1
Power Consumption (short-time) at:								
48 – 60 V AC	VA	401 – 501	401 – 501	401 – 501	401 – 501	401 – 501	401 – 501	401 – 501
110 – 127 V AC	VA	424 – 489	424 – 489	424 – 489	424 – 489	424 – 489	424 – 489	424 – 489
208 – 277 V AC	VA	533 – 736	533 – 736	533 – 736	533 – 736	533 – 736	533 – 736	533 – 736
380 – 600 V AC	VA	408 – 645	408 – 645	408 – 645	408 – 645	408 – 645	408 – 645	408 – 645
24 V DC	W	594	594	594	594	594	594	594
48 – 60 V DC	W	740 – 925	740 – 925	740 – 925	740 – 925	740 – 925	740 – 925	740 – 925
110 – 127 V DC	W	559 – 648	559 – 648	559 – 648	559 – 648	559 – 648	559 – 648	559 – 648
220 – 250 V DC	W	722 – 820	722 – 820	722 – 820	722 – 820	722 – 820	722 – 820	722 – 820
Max. Operating time	ms	50	50	50	50	50	50	50

① Consult Siemens for short circuit values.

② Review individual frame and type values.

VL Molded Case Circuit Breakers

Technical Data

Selection

		DG	FG	JG	LG	MG	NG	PG
Undervoltage Trip								
Drop voltage (percentage)	V	35% – 70%	35% – 70%	35% – 70%	35% – 70%	35% – 70%	35% – 70%	35% – 70%
Pick-up voltage (percentage)	V	70% – 85%	70% – 85%	70% – 85%	70% – 85%	70% – 85%	70% – 85%	70% – 85%
Power consumption (continuous) at:								
110 – 127 V AC	VA	1	1	1	1	1.1	1.1	1.1
220 – 250 V AC	VA	2.1	2.1	2.1	2.1	2.1	2.1	2.1
208 V AC	VA	1.2	1.2	1.2	1.2	1.2	1.2	1.2
277 V AC	VA	1.4	1.4	1.4	1.4	1.4	1.4	1.4
380 – 415 V AC	VA	1.9	1.9	1.9	1.9	1.9	1.9	1.9
440 – 480 V AC	VA	2.2	2.2	2.2	2.2	2.2	2.2	2.2
500 – 525 V AC	VA	2.5	2.5	2.5	2.5	2.5	2.5	2.5
600 V AC	VA	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Max. opening time	ms	50	50	50	50	50	50	50
Motorized Operating Mechanism								
Motor with stored energy mechanism (synchronizable)		X	X	X	X			
Motor Operator						X	X	X
Max. switching rate (per hour)		120	120	120	60	60	30	30
Command duration	ms	20 – 50	20 – 50	20 – 50	20 – 50	20 – 50	—	—
Closing time	ms	<100	<100	<100	<100	<100	<5,000	<5,000
Charging time	s	<5	<5	<5	<5	<5	<5	<5
Break time	s	<5	<5	<5	<5	<5	<5	<5
Power consumption	VA/W	<500						
Inrush (A)								
Control Voltages								
110 – 127 V AC								
220 – 250 V AC								
24 V DC								
48 V DC								
60 V DC								
Operating Range 85 – 110% of rated control voltage								

VL Molded Case Circuit Breakers

Unusual Operating Conditions

Reference

Note: The information provided on this and the next page is intended for reference and recommendation only. Because several variables can act on a circuit breaker's performance at the same time, the data below is based less on controlled testing, than on experience and engineering judgment. Contact Siemens for further information on special conditions and treatment.

High Ambient Temperatures

Because thermal-magnetic trip breakers are temperature sensitive and calibrated for a specific ambient of 40° C (104° F) (average enclosure temperature), a higher ambient will cause the breaker to trip at lower current than its nameplate rating, in other words, causing the breaker to "derate" (see Table 1). Similarly, the current carrying capacity of a circuit conductor is based upon a certain ambient temperature, a higher ambient will reduce its current carrying capacity, causing it to "derate." Thus, with a fluctuating temperature, a thermal-magnetic breaker will derate nearly parallel with its connected circuit conductors and maintain close circuit protection. If the application temperature exceeds 40° C (104° F) and is known, either a breaker specially calibrated for the higher ambient or one oversized according to Table 1 may be selected. In a case such as this, the circuit conductors should be oversized as well.

Siemens Electronic Trip Unit Breakers are insensitive to temperature changes. However, they do include circuitry to protect the components from abnormally high temperatures.

Altitude

Reduced air density at altitudes greater than 6600 ft. (2000 meters) affects the ability of a molded case circuit breaker to transfer heat and interrupt faults. Therefore, circuit breakers applied at these altitudes should have interrupting, insulation and continuous currents derated as indicated in Figure 1.

Table 1 – Temperature derating data for thermal-magnetic breakers

Reference Ampere Rating at 40° C (104° F)	Ampere Rating at:			Siemens Breaker Frames
	25° C (77° F)	50° C (122° F)	60° C (140° F)	
50	55	46	42	DG
60	66	56	52	
70	77	65	60	
90	99	84	78	
100	110	94	87	
125	137	114	100	
150	165	136	120	
175	192	159	140	
200	220	182	160	
225	247	205	180	
250	275	235	220	FG
300	330	276	252	
350	385	325	301	
400	440	372	340	
500	550	468	435	
600	660	564	525	
700	770	658	613	
800	880	754	704	
900	990	828	749	
1000	1100	900	825	
1200	1320	1090	1000	JG
1400	1540	1304	1148	
1600	1760	1500	1320	
				LG
				MG
				NG
				PG

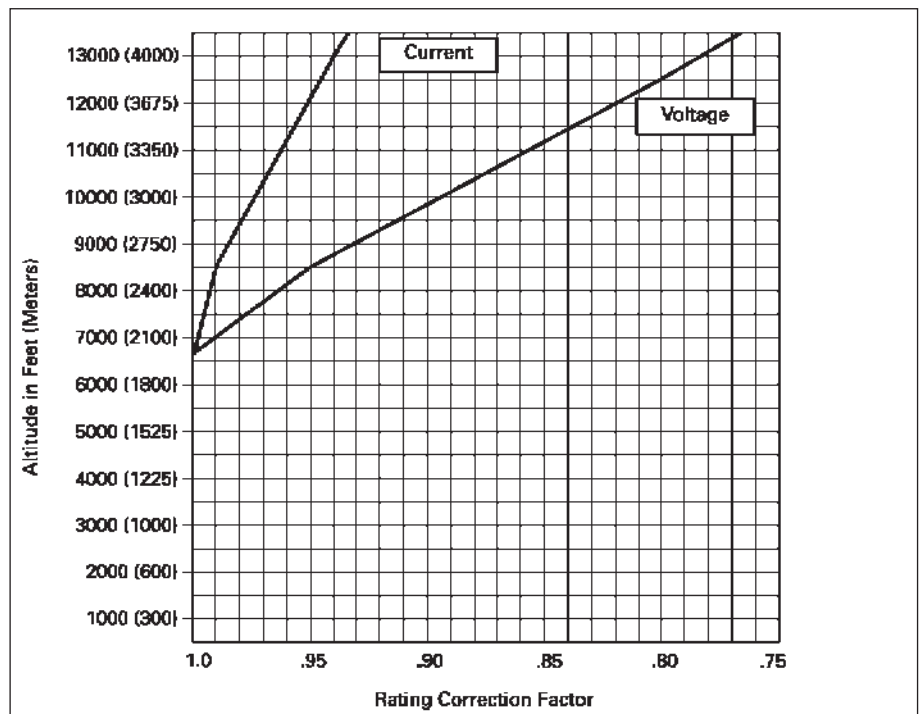


Figure 1 – Altitude adjustment

Ordering Instructions

- All ED Frame Sentron circuit breakers are supplied with load side lugs. If line side lugs are required, add "L" suffix to catalog number. Consult Siemens sales office for any additional charge
- 50°C Calibration, 400HZ - see page 17/104. All ED frame circuit breakers may be reverse connected

Type ED2^⑤

Blue Label

Continuous Current Rating @ 40°C	1-Pole		2-Pole		3-Pole
	120V AC	125V DC	240V AC	125V DC 250V DC	240V AC
	Catalog Number		Catalog Number		Catalog Number
15	ED21B015 ^④ ■		ED22B015		ED23B015
20	ED21B020 ^④ ■		ED22B020		ED23B020
25	ED21B025■		ED22B025■		ED23B025■
30	ED21B030■		ED22B030		ED23B030
35	ED21B035■		ED22B035■		ED23B035■
40	ED21B040■		ED22B040		ED23B040
45	ED21B045■		ED22B045■		ED23B045■
50	ED21B050■		ED22B050		ED23B050
60	ED21B060■		ED22B060		ED23B060
70	ED21B070■		ED22B070		ED23B070
80	ED21B080■		ED22B080■		ED23B080
90	ED21B090■		ED22B090■		ED23B090■
100	ED21B100■		ED22B100		ED23B100

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
ED2, ED4, ED6, HED4, HHED6		
1	30	38
2	10	25
3	10	38
CED6		
2	5	20
3	5	30

Type ED4^⑤

Blue Label

Continuous Current Rating @ 40°C	1-Pole		2-Pole		3-Pole
	120V AC	125V DC	480V AC	250V DC	480V AC
	Catalog Number		Catalog Number		Catalog Number
15	ED41B015 ^④		—		ED43B015
20	ED41B020 ^④		ED42B020		ED43B020
25	ED41B025		ED42B025		ED43B025
30	ED41B030		ED42B030		ED43B030
35	ED41B035■		ED42B035■		ED43B035
40	ED41B040		ED42B040		ED43B040
45	ED41B045■		ED42B045■		ED43B045
50	ED41B050		ED42B050		ED43B050
60	ED41B060		ED42B060		ED43B060
70	ED41B070		ED42B070		ED43B070
80	ED41B080■		ED42B080■		ED43B080
90	ED41B090■		ED42B090■		ED43B090
100	ED41B100		ED42B100		ED43B100
110	—		ED42B110■		ED43B110
125	—		ED42B125		ED43B125

Lugs

Ampere Rating	No. of Poles	Catalog Number	Wire Range
Aluminum Body Lugs			
All 15–25A	1, 2, 3	Line/Load SA1E025	#14–#10 Cu #12–#10 Al
All 30–100A	1, 2, 3	Line Side LN1E100	#10–1/0 Cu/Al
ED2, 4, CED6 30–60A	1	Load Side LD1E060	#10–#4 Cu/Al
ED2, 4, CED6 70–100A	1	Load Side LD1E100	#6–#1/0 Cu/Al
ED2, 4, HED4, HHED6 30–100A	2, 3	Load Side LN1E100	#10–1/0 Cu/Al
ED6 20–50A	2, 3	Line Side LN1E100	#10–1/0 Cu/Al
All 110, 125A	2, 3	Line/Load TA1E6125	#3–3/0 Cu #1–2/0 Al
Copper Body Lugs			
All 30–125A	1, 2, 3	Line/Load TC1ED6150 ^③	#10–1/0 Cu only
Compression Lugs			
All ED, HHED, CED		CCE125	2/0

Type ED6^⑤

Blue Label

Continuous Current Rating @ 40°C	1-Pole ^①	2-Pole		3-Pole	
	347V AC	600V AC	250V DC	600V AC	500V DC
	Catalog Number	Catalog Number		Catalog Number	
15	ED61B015	—		ED63B015	
20	ED61B020	ED62B020		ED63B020	
25	ED61B025	ED62B025■		ED63B025	
30	ED61B030	ED62B030		ED63B030	
35	ED61B035	ED62B035■		ED63B035	
40	ED61B040	ED62B040■		ED63B040	
45	ED61B045■	ED62B045■		ED63B045	
50	ED61B050	ED62B050■		ED63B050	
60	ED61B060	—		ED63B060	
70	ED61B070■	—		ED63B070	
80	ED61B080	—		ED63B080	
90	ED61B090	—		ED63B090	
100	ED61B100■	—		ED63B100	
110	—	—		ED63B110	
125	—	—		ED63B125	

Enclosures (Neutral Included)^⑥

Type	Catalog Number
1 (Surface)	E2N1S (15–100A)
1 (Flush)	E2N1F (15–100A)
3R	E2N3R (15–100A)
4–4X	ED6SS4 (15–100A)
7–9	EA (15–60A)
7–9	EB (70–100A)
12	E2N12 (15–100A)
1 (Surface)	CED6N1S ^②
1 (Flush)	CED6N1F ^②
3R	CED6N3R ^②
12	CED6N12 ^②

Note: ED frame circuit breakers qualified to UL 489 Supplement SB "Naval"—See page 17/104 for additional information

■ Built to order. Allow 2–3 weeks for delivery.
① CSA Certified only (Not UL)

② For CED types and all 110–125 ampere ED frames.

③ See **Note: A**, page 17/101.

④ SWD rated.

⑤ HACR rated.

⑥ Not for use with HHED6 breakers.

Modifications page 17/104

Accessories pages 17/65 and 17/108 to 17/113

Sentron Molded Case Circuit Breakers

ED 125A Frame Sentron Series

Selection/Dimensions

Type HED4^⑥

Black Label

Continuous Current Rating @ 40°C	1-Pole		2-Pole		3-Pole
	277V AC	125V DC	480V AC	250V DC	480V AC
	Catalog Number		Catalog Number		Catalog Number
15	HED41B015 ^①		HED42B015		HED43B015
20	HED41B020 ^①		HED42B020		HED43B020
25	HED41B025		HED42B025■		HED43B025
30	HED41B030		HED42B030		HED43B030
35	HED41B035■		HED42B035■		HED43B035
40	HED41B040		HED42B040		HED43B040
45	HED41B045■		HED42B045■		HED43B045
50	HED41B050■		HED42B050		HED43B050
60	HED41B060■		HED42B060■		HED43B060
70	HED41B070■		HED42B070■		HED43B070
80	HED41B080■		HED42B080■		HED43B080
90	HED41B090■		HED42B090■		HED43B090
100	HED41B100■		HED42B100■		HED43B100
110	—		HED42B110■		HED43B110
125	—		HED42B125■		HED43B125

FIGURE 1 - ED, HED, HHED

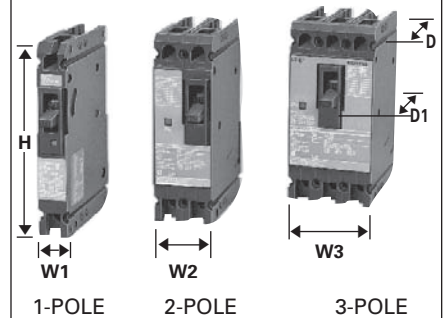
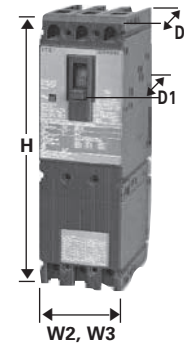


FIGURE 2 - CED (3-Pole shown)



Fuseless Current Limiting

Type HHED6^⑥

Black Label

Type CED6^⑥

Red Label

Continuous Current Rating @ 40°C	3-Pole	2-Pole	3-Pole
	600V AC	600V AC, 250V DC	600V AC, 500V DC ^②
	Catalog Number ^①	Catalog Number	Catalog Number
15	HHED63B015A	CED62B015	CED63B015
20	HHED63B020	CED62B020■	CED63B020
25	HHED63B025	—	—
30	HHED63B030	CED62B030■	CED63B030
35	HHED63B035	—	—
40	HHED63B040	CED62B040■	CED63B040
45	HHED63B045	—	—
50	HHED63B050	CED62B050■	CED63B050
60	—	CED62B060■	CED63B060
70	—	CED62B070■	CED63B070
80	—	CED62B080■	CED63B080
90	—	CED62B090■	CED63B090
100	—	CED62B100■	CED63B100
110	—	—	CED63B110■
125	—	CED62B125■	CED63B125

Dimensions (in inches)

Breaker Type	W1	W2	W3	H	D	D1
Figure 1 ED2, ED4, ED6, HED4, ED6 ETI ^④	1	2	3	6.35	3.92	4.56
Figure 1 HHED6	—	2	3	6.53	3.92	4.56
Figure 2 CED6, CED6 ETI ^④	—	2	3	9.58	3.92	4.56

Interrupting Ratings

Breaker Type	UL 489 AIR (File #E10848)									IEC 947-2					
	RMS Symmetrical Amperes (KA)									Volts AC (50/60Hz)					
	Volts AC									Volts DC					
	120	240	277	347	480	600	125	250	500 ^③	220/240		380/415		500	
ED2 (1-P)	10	—	—	—	—	—	5	—	—	Icu	Ics	Icu	Ics	Icu	Ics
ED2 (2, 3-P)	—	10	—	—	—	—	—	5 (2-P)	—	—	—	—	—	—	—
ED4 (1-P)	65	—	22	—	—	—	30	—	—	—	—	—	—	—	—
ED4 (2, 3-P)	—	65	—	—	18	—	—	30 (2-P)	—	—	—	—	—	—	—
ED6 (1P)	—	—	—	30 ^③	—	—	—	—	—	—	—	—	—	—	—
ED6 (2, 3-P)	—	65	—	—	25	18	—	—	18 (3-P)	65	17	35	9	18	5
HED4 (1-P) (15-30A)	100	—	65	—	—	—	30	—	—	—	—	—	—	—	—
HED4 (1-P) (35-100A)	100	—	25	—	—	—	30	—	—	—	—	—	—	—	—
HED4 (2, 3-P) ^⑤	—	100	—	—	42	—	—	30 (2-P)	—	—	—	—	—	—	—
HHED6 (2, 3-P) ^⑤	—	100	—	—	65	18 ^②	—	—	—	—	—	—	—	—	—
CED6 (2, 3-P)	—	200	—	—	200	100	—	50 (2-P)	30 (3-P)	—	—	—	—	—	—

■ Built to order. Allow 2-3 weeks for delivery.

①SWD rated.

②When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems.

③ HED4 and HHED6 type circuit breakers meet the UL criteria for "current limiting" at 240V AC.

④ ED6-ETI, CED6-ETI, see page 17/91 for ordering information.

⑤ Single Pole 15-30A 30KA @ 347V non-UL.
35-100A 18KA @ 347V non-UL.

⑥ HACR rated.

⑦ HHED63B015A is rated 18KAIC at 600/347V.

Accessories for:

ED 125A Frame



Combinations

Available only when ordered together. Only one module can be added to a breaker. Additional accessories, which always attach to the left pole, cannot be added to the combination later. Adds 1 inch pole space.

Equipment Ground Sensing

A field addable kit containing 30mA or 5 mA ground fault accessory module, current transformer with 24 inch leads, and current transformer mounting equipment. Current transformer to mount in gutter of lighting panel or any control panel. Accessory module operates from separate 120V control power source.

Both 30MA and 5MA devices are equipment protection devices only. Do not use for personnel protection.



Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch	1 Shunt Trip and 1 Auxiliary Switch and 1 Alarm Switch	1 Shunt Trip and 1 Alarm Switch	1 Shunt Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
24		S17ED60	—	—	—	—
48		S18ED60	—	—	—	—
120		S01ED60	S01ED62A	S01ED62AB	S01ED62B	S01ED62AA
208		—	S02ED62A▲	S02ED62AB▲	S02ED62B▲	S02ED62AA▲
240		S03ED60	S03ED62A	S03ED62AB	S03ED62B▲	S03ED62AA▲
277		S15ED60▲	S15ED64A▲	S15ED64AB▲	S15ED64B▲	—
480		S04ED60	S04ED64A▲	S04ED64AB▲	S04ED64B▲	—
	12	S16ED60▲	S16ED62A▲	—	—	—
	24	S07ED60	S07ED62A	S07ED62AB▲	S07ED62B▲	S07ED62AA▲
	48	S09ED60▲	S09ED62A▲	S09ED62AB▲	S09ED62B▲	S09ED62AA▲
	125	S11ED60▲	S11ED62A▲	S11ED62AB▲	S11ED62B▲	S11ED62AA▲
	250	S13ED60▲	S13ED62A▲	S13ED62AB▲	S13ED62B▲	S13ED62AA▲

Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 1 Auxiliary Switch and 1 Alarm Switch	1 Undervoltage Trip and 1 Alarm Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
120		U01ED60	U01ED62A	U01ED62AB▲	U01ED62B▲	U01ED62AA▲
208		U02ED60▲	U02ED62A▲	U02ED62AB▲	U02ED62B▲	U02ED62AA▲
240		U03ED60	U03ED62A▲	U03ED62AB▲	U03ED62B▲	U03ED62AA▲
277		U16ED60▲	U16ED64A▲	U16ED64AB▲	U16ED64B▲	—
480		U06ED60▲	U06ED64A▲	U06ED64AB▲	U06ED64B▲	—
600		U08ED60▲	—	—	—	—
	24	U13ED60	U13ED62A▲	U13ED62AB▲	U13ED62B▲	U13ED62AA▲
	48	U14ED60▲	U14ED62A▲	U14ED62AB▲	U14ED62B▲	U14ED62AA▲
	125	U10ED60▲	U10ED62A▲	U10ED62AB▲	U10ED62B▲	U10ED62AA▲
	250	U12ED60▲	U12ED62A▲	—	—	U12ED62AA▲

Auxiliary Switch Combinations

Maximum Voltage		1 Auxiliary Switch	1 Alarm Switch and 1 Auxiliary Switch	2 Auxiliary Switches	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number	Catalog Number
240	250	A01ED62	A01ED62B	A02ED62	A02ED62B
480		A01ED64	A01ED64B	—	—

Maximum Voltage		1 Auxiliary Switch	
AC	DC	Catalog Number	
	12	A01EDLV	Gold Plated Contacts—for PLC use

Alarm Switch Only

Maximum Voltage		1 Alarm Switch
AC	DC	Catalog Number
240	250	B00ED62
480		B00ED64

Ground Fault Sensing Relay Kit — Equipment Protection Only

For Use With Breaker Frame	Number of Poles	Description	Catalog Number	
			30mA	5mA
CED6, ED2, ED4 ED6, EFC, EFF, HED4, HHED6	1, 2, 3	Basic Kit	GF01ED60	GF01ED65
		Basic Kit with Normally Open Bell Alarm	GF01ED60B0	GF01ED65B0▲
		Basic Kit with Normally Closed Bell Alarm	GF01ED60BC	GF01ED65BC▲

▲ Built to order. Allow 6–8 weeks for delivery.

Sentron Molded Case Circuit Breakers

Accessories

• Revised •
07/20/14

Selection

Type FXD6-A^{①⑦}

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker – Without Lugs)		
Continuous Current Rating @ 40°C	2-Pole	3-Pole
	Catalog Number	Catalog Number
70	FXD62B070■	FXD63B070
80	FXD62B080■	FXD63B080
90	FXD62B090■	FXD63B090
100	FXD62B100■	FXD63B100
110	FXD62B110■	FXD63B110
125	FXD62B125■	FXD63B125
150	FXD62B150■	FXD63B150
175	FXD62B175■	FXD63B175
200	FXD62B200■	FXD63B200
225	FXD62B225■	FXD63B225
250	FXD62B250■	FXD63B250

Type FD6-A^⑦

Blue Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

2-Pole 600V AC, 250V DC^②

70	FD62B070■	FD62F250	FD62T070■
80	FD62B080■		FD62T080■
90	FD62B090■		FD62T090■
100	FD62B100■		FD62T100■
110	FD62B110■		FD62T110■
125	FD62B125■		FD62T125■
150	FD62B150■		FD62T150■
175	FD62B175■		FD62T175■
200	FD62B200■		FD62T200■
225	FD62B225■		FD62T225■
250	FD62B250■		FD62T250■

3-Pole 600V AC, 500V DC^③

70	FD63B070■	FD63F250	FD63T070■
80	FD63B080■		FD63T080■
90	FD63B090■		FD63T090■
100	FD63B100■		FD63T100■
110	FD63B110■		FD63T110■
125	FD63B125■		FD63T125■
150	FD63B150■		FD63T150■
175	FD63B175■		FD63T175■
200	FD63B200■		FD63T200■
225	FD63B225■		FD63T225■
250	FD63B250■		FD63T250■

Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)										
	UL 489 AIR (File E10848)					IEC 947-2					
	Volts AC (50/60Hz)			Volts DC		Volts AC (50/60Hz)					
	240	480	600	250	500 ^③	220/240		380/415		500	
						Icu	Ics	Icu	Ics	Icu	Ics
FXD6-A, FD6-A	65	35	22	30 (2-P)	18 (3-P)	65	33	35	9	—	—
HFXD6 ^⑤ , HFD6 ^⑥	100	65	25	30 (2-P)	25 (3-P)	100	50	65	33	—	—
HHFD6 ^⑤ , HHFXD6 ^⑥	200	100	25	—	—	—	—	—	—	—	—
CFD6	200	200	100	30 (2-P)	50 (3-P)	—	—	—	—	—	—

Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values							
	±20% Tolerance Low	2	3	4	5	6	7	±20% Tolerance High
70-90	600	640	690	730	770	810	850	900
100-110	700	770	840	920	990	1060	1140	1200
125-150	800	900	1000	1100	1200	1300	1400	1500
175-200	900	1060	1210	1370	1520	1780	1930	2000
225-250	1100	1300	1500	1700	1900	2100	2300	2500

Note: FD frame qualified to UL489 supplement SB "NAVAL".
See page 7-91 for additional information.

Ordering Information

Complete Breaker Unassembled with Lugs

Prices of FD6, HFD6, and HHFD6 breakers includes frame, trip and both line and load lugs (TA1FD350A). When ordered by these catalog numbers, the customer will receive the frame, trip, and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

Complete Breaker Assembled without Lugs

Prices of FXD6, HFXD6, HHFXD6, and CFD6 includes frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA1FD350A) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).

50°C Applications see page 7-91.

400 Hz Applications see page 7-91.

Lugs For 75°C Wire^⑤

Catalog Number	Wire Range
TA1FD350A	#6—350 kcmil Cu #4—350 kcmil Al
TC1FD350	#6—350 kcmil Cu
Compression Lug	
CCF250	350 kcmil Cu/Al

Enclosures

Type	Catalog Number
1	F6N1S(F)
3R	F6N3R
4-4X	FD6SS4
7-9	EC2
12	F6N12
Neutral ^④	N250

Modifications page 7-91
Enclosures Section 6
Accessories pages 7-50 and 7-95 to 7-100

■ Built to order. Allow 2–3 weeks for delivery.

①Type FXD6-A circuit breakers are UL Listed for reverse fed applications.

②2-pole units are 3-pole width.

③When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

④Order neutral as separate item.

⑤ See **Note: A**, page 7-88.

⑥ HFD6 and HHFD6 type circuit breakers meet the UL criteria for "current limiting" at 240 and 480V AC.

⑦ HACR rated.

Sentron Molded Case Circuit Breakers

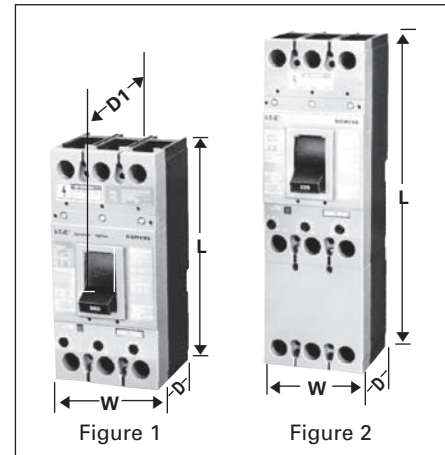
FD 250A Frame Sentron Series

Selection/Dimensions

Type HFD6, Type HFXD6^{②③④⑤⑥}

Black Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number
2-Pole 600V AC, 250V DC (3-Pole Width)			
70	HFD62B070■	HFD62F250	FD62T070■
80	HFD62B080■		FD62T080■
90	HFD62B090■		FD62T090■
100	HFD62B100■		FD62T100■
110	HFD62B110■		FD62T110■
125	HFD62B125■		FD62T125■
150	HFD62B150■		FD62T150■
175	HFD62B175■		FD62T175■
200	HFD62B200■		FD62T200■
225	HFD62B225■		FD62T225■
250	HFD62B250■		FD62T250■



3-Pole 600V AC, 500V DC^①

70	HFD63B070■	HFD63F250	FD63T070■
80	HFD63B080■		FD63T080■
90	HFD63B090■		FD63T090■
100	HFD63B100■		FD63T100■
110	HFD63B110■		FD63T110■
125	HFD63B125■		FD63T125■
150	HFD63B150■		FD63T150■
175	HFD63B175■		FD63T175■
200	HFD63B200■		FD63T200■
225	HFD63B225■		FD63T225■
250	HFD63B250■		FD63T250■

Dimensions (in inches)

Breaker Type	W	L	D	D1 (to handle)
Figure 1 FXD6-A, FD6-A, HFD6, HFXD6, HHFD6, FD6-ETI ^⑤	4.50	9.50	4	5.25
Figure 2 CFD6, CFD6-ETI ^⑤	4.50	14.25	4	5.25

Type HHFD, HHFXD6^{②③④⑥}

3-Pole 600V AC, Extra High Interrupting

70	HHFD63B070■	HHFD63F250	FD63T070■
80	HHFD63B080■		FD63T080■
90	HHFD63B090■		FD63T090■
100	HHFD63B100■		FD63T100■
110	HHFD63B110■		FD63T110■
125	HHFD63B125■		FD63T125■
150	HHFD63B150■		FD63T150■
175	HHFD63B175■		FD63T175■
200	HHFD63B200■		FD63T200■
225	HHFD63B225■		FD63T225■
250	HHFD63B250■		FD63T250■

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
FD6-A, HFD6, HHFD6, FXD6-A Assembled Circuit Breaker (less connectors)		
2	1	8.6
3	1	10
FD6-A, HFD6, HHFD6 Frame Only		
2	1	7.5
3	1	8.7
FD6 Trip Unit Only		
2	1	1.1
3	1	1.3
CFD6 Assembled Circuit Breaker (less terminals)		
3	1	16

Type CFD6-A^{③⑥}

Fuseless Current Limiting

Red Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)	
Continuous Current Rating @ 40°C	3-Pole 600V AC/500V DC
	Catalog Number
70	CFD63B070■
80	CFD63B080■
90	CFD63B090■
100	CFD63B100■
110	CFD63B110■
125	CFD63B125■
150	CFD63B150■
175	CFD63B175■
200	CFD63B200■
225	CFD63B225■
250	CFD63B250■

■ Built to order. Allow 2-3 weeks for delivery.

① When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems.

② For non-interchangeable trip 3-pole HFD6 type circuit

breaker, change prefix identifier from HFD6 to HFXD6. Price equals frame and trip prices combined, e.g. price of HFXD63B250 equals price of HFD63F250 plus price of FD63T250. Order lugs separately.

③ Type HFXD6, HHFXD6, CFD6 are UL Listed for reverse feed applications.

④ Type HFXD6, HFD6, HHFD6, HHFXD6 meet the UL criteria for "Current Limiting" at 240 VAC and 480V AC.

⑤ FXD6, ETI, CFD6, ETI — See page 17/91 for ordering information.

⑥ HACR rated.

Sentron Molded Case Circuit Breakers

Internal Accessories

Selection

Accessories:
for FD, FFC & FFF 250A Frames



Shunt Trip Combinations

Control Voltage		1 Shunt Trip
AC	DC	Catalog Number
24		S17FD60
120		S01FD60
240		S03FD60
277		S15FD60▲
480		S04FD60
600		S06FD60▲
	12	S16FD60▲
	24	S07FD60
	48	S09FD60▲
	125	S11FD60
	250	S13FD60▲

Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
120		U01FD60	W01FD64
208		U02FD60▲	W02FD64▲
240		U03FD60	W03FD64▲
277		U16FD60▲	W16FD64▲
480		U06FD60▲	W06FD64▲
600		U08FD60▲	—
	24	U13FD60	W13FD64
	48	U14FD60▲	W14FD64▲
	125	U10FD60▲	W10FD64▲
	250	U12FD60▲	W12FD64▲

Auxiliary Switch Combinations

Voltage		1 Auxiliary Switch	2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number
240		A01FD62	A02FD62
480		A01FD64	A02FD64
	12	A01FDLV	Gold Plated Contacts - for PLC use

Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
480	250	B00FD64	C01FD64

▲ Built to order. Allow 6–8 weeks for delivery.

① Auxiliary switch application is for 480V AC maximum.

Note: Old F-frame accessories cannot be used in new Sentron line. Likewise, new FD-frame accessories cannot be used on old F-frame circuit breakers.

Sentron Molded Case Circuit Breakers

JD 400A Frame Sentron Series

Selection

Type JXD2-A^⑤

240V AC, 2-Pole 250V DC Only

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)		
Continuous Current Rating @ 40°C	2-Pole (3-Pole Width) Catalog Number	3-Pole Catalog Number
200	JXD22B200■	JXD23B200
225	JXD22B225■	JXD23B225
250	JXD22B250■	JXD23B250
300	JXD22B300	JXD23B300
350	JXD22B350■	JXD23B350
400	JXD22B400	JXD23B400

Type JXD6-A^{①⑤}

600V AC, 2-Pole 250V DC, 3-Pole 500V DC^②

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)		
Continuous Current Rating @ 40°C	2-Pole (3-Pole Width) Catalog Number	3-Pole Catalog Number
200	JXD62B200■	JXD63B200
225	JXD62B225■	JXD63B225
250	JXD62B250■	JXD63B250
300	JXD62B300	JXD63B300
350	JXD62B350■	JXD63B350
400	JXD62B400	JXD63B400

Type JD6-A^⑤

Blue Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number

2-Pole 600V AC, 250V DC (3-Pole Width)

Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number
200	JD62B200■	JD62F400	JD62T200■
225	JD62B225■		JD62T225■
250	JD62B250■		JD62T250■
300	JD62B300■		JD62T300■
350	JD62B350■		JD62T350■
400	JD62B400		JD62T400

3-Pole 600V AC, 500V DC^②

Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number
200	JD63B200	JD63F400	JD63T200
225	JD63B225		JD63T225
250	JD63B250		JD63T250
300	JD63B300		JD63T300
350	JD63B350		JD63T350
400	JD63B400		JD63T400

Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)									
	UL 489 AIR (File E10848)					IEC 947-2				
	Volts AC (50/60Hz)			Volts DC		Volts AC (50/60Hz)				
	240	480	600	250	500 ^②	220/240	380/415	500		
JXD2-A	65	—	—	30 (2-P)	—	—	—	—	—	—
JXD6-A, JD6-A	65	35	25	30 (2-P)	25 (3-P)	65	33	40	20	—
HJD6-A, HJXD6-A	100	65	35	30 (2-P)	35 (3-P)	100	50	65	30	—
HHJD6, HHJXD6 ^⑥	200	100	50	—	—	—	—	—	—	—
CJD6-A	200	150	100	30 (2-P)	50 (3-P)	—	—	—	—	—

Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values							
	±20% Tolerance Low	2	3	4	5	6	7	±20% Tolerance High
200-300	1250	1430	1610	1790	1960	2140	2320	2500
350-400	2000	2290	2570	2860	3140	3430	3710	4000

■ Built to order. Allow 2–3 weeks for delivery.

①Type JXD2 and JXD6 circuit breakers are UL Listed for reverse feed applications.

②When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

③See Note: A, page 17/101

④HHJD6 type circuit breakers meet the UL criteria for “current limiting” at 240 and 480V AC.

⑤HACR rated.

Note: JD frame qualified to UL489 supplement B “NAVAL.” See page 17/104 for additional information.

Ordering Information

Complete Breaker Unassembled with Lugs

Prices of JD6, HJD6, and HHJD6 breakers include frame, trip and both line and load lugs (TA2J6500). When ordered by these catalog numbers, the customer will receive the frame, trip, and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

Complete Breaker Assembled with-out Lugs

Prices of JXD6, HJXD6, HHJXD6, and CJD6 include frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA2J6500) installed, add suffix “L” to catalog number (add 2 times list price of lugs for each pole).

100% Rated (3-pole only)

Types JXD6 and HJXD6 breakers are available with 100% ratings. To order add suffix “H” to catalog number, and 10% to list price.■

100% rated JD breakers require the use of 90°C Cu cable sized at 75°C ampacity and lugs TC1J6600 or TC2J6500.

50°C Applications see page 17/104.

400Hz Applications see page 17/104.

Lugs For 75°C Wire^③

Catalog Number	Cables per Lug	Wire Range
TA2J6500	1, 2	#3/0-500 kcmil Cu #4/0-500 kcmil Al
TA1L6750	1	500-750 kcmil Al 500-600 kcmil Cu
TC1J6600	1	#3/0-600 kcmil Cu
TC2J6500	1, 2	#3/0-500 kcmil Cu
Compression Lug		
CCL600	1	500 kcmil Cu/Al

Modifications page 17/104

Accessories pages 17/72 and 17/108 to 17/113

Sentron Molded Case Circuit Breakers

JD 400A Frame Sentron Series

Selection/Dimensions

Type HJD6-A, HJXD6-A^{②④⑥}

Black Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number
2-Pole 600V AC, 250V DC (3-Pole Width)			
200	HJD62B200■	HJD62F400■	JD62T200■
225	HJD62B225■		JD62T225■
250	HJD62B250■		JD62T250■
300	HJD62B300■		JD62T300■
350	HJD62B350■		JD62T350■
400	HJD62B400■		JD62T400■

3-Pole 600V AC, 500V DC^{①②⑤}

200	HJD63B200■	HJD63F400■	JD63T200■
225	HJD63B225■		JD63T225■
250	HJD63B250■		JD63T250■
300	HJD63B300■		JD63T300■
350	HJD63B350■		JD63T350■
400	HJD63B400■		JD63T400■

Type HHJD6, HHJXD6^{②④⑥}

Black Label

2-Pole 600V AC (3-Pole Width)

200	HHJD62B200■	HHJD62F400■	JD62T200■
225	HHJD62B225■		JD62T225■
250	HHJD62B250■		JD62T250■
300	HHJD62B300■		JD62T300■
350	HHJD62B350■		JD62T350■
400	HHJD62B400■		JD62T400■

3-Pole 600VAC

200	HHJD63B200■	HHJD63F400■	JD63T200■
225	HHJD63B225■		JD63T225■
250	HHJD63B250■		JD63T250■
300	HHJD63B300■		JD63T300■
350	HHJD63B350■		JD63T350■
400	HHJD63B400■		JD63T400■

Type CJD6-A^{⑤⑥}

Fuseless Current Limiting

Red Label

Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)		
Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC	3-Pole 600V AC/500V DC
	Catalog Number	Catalog Number
200	For 2-pole application use outside poles of 3-pole circuit breaker	CJD63B200■
225		CJD63B225■
250		CJD63B250■
300		CJD63B300■
350		CJD63B350■
400		CJD63B400■

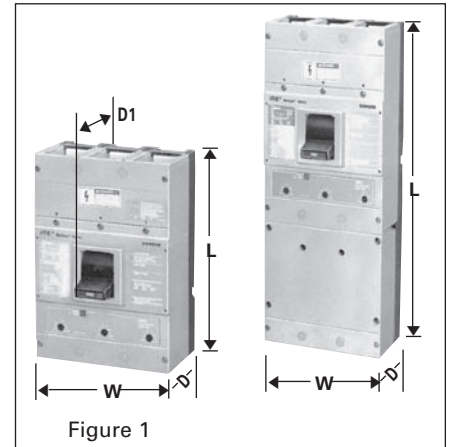


Figure 1

Dimensions (in inches)

Breaker Type	W	L	D	To Handle D1
Figure 1 JXD2-A, JXD6-A, JD6-A HJD6-A, HJXD6-A, HHJD6, HJD6, HJXD6, HHJXD6, JXD6-ETI ^⑧ , SJD6, SHJD6	7.5	11	4	5.44
Figure 2 CJD6, CJD6-ETI ^⑧ , SCJD6	7.5	17.86	4	5.44

Enclosures (Except SCJD6)

Type	Catalog Number
1	J6N1
3R	J6N3R
12	J6N12
4X	LD6SS4
7, 9 (200-250A)	EC4
7, 9 (300-400A)	EE
Neutral	W60992

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
JXD2, JXD6, JD6, HJD6, HHJD6 Assembled Breaker (less terminals)		
2	1	17.5
3	1	19.5
JD6, HJD6, HHJD6 Frame Only		
2	1	14
3	1	15.5
JD6 Trip Unit Only		
2	1	3.5
3	1	4
CJD6 Complete Assembled Breaker (less terminals)		
3	1	31.5

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2-3 weeks for delivery.

2-pole units available in 3-pole construction.

① When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

② For non-interchangeable 3-pole HJD6 or HHJD6 type circuit breaker change the prefix identifier to HJXD6 or HHJXD6. Price equals price of frame plus price of trip, e.g. price of HJXD63B400 equals price of HJD63F400 plus price of JD63T400. Order lugs separately.

③ JXD6-ETI, CJD6-ETI see page 17/91 for ordering information.

④ Type HJXD6, HHJXD6 Circuit Breakers are UL listed for reverse fed applications.

⑤ CE applies to non-interchangeable type HJXD6-A only.

⑥ HACR rated.

Sentron Molded Case Circuit Breakers

SJD 400A Frame Digital Solid State Sentron Sensitrip III Series

Selection

Type SJD6-A

Blue Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SJD69200■	200
SJD69300■	300
SJD69400■	400
SJD69200G■	200
SJD69300G■	300
SJD69400G■	400
SJD69200NT■	200
SJD69300NT■	300
SJD69400NT■	400
SJD69200NGT■	200
SJD69300NGT■	300
SJD69400NGT■	400

Type SHJD6-A

Black Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SHJD69200■	200
SHJD69300■	300
SHJD69400■	400
SHJD69200G■	200
SHJD69300G■	300
SHJD69400G■	400
SHJD69200NT■	200
SHJD69300NT■	300
SHJD69400NT■	400
SHJD69200NGT■	200
SHJD69300NGT■	300
SHJD69400NGT■	400

Current Limiting

Type SCJD6-A

Red Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SCJD69200■	200
SCJD69300■	300
SCJD69400■	400
SCJD69200G■	200
SCJD69300G■	300
SCJD69400G■	400
SCJD69200NT■	200
SCJD69300NT■	300
SCJD69400NT■	400
SCJD69200NGT■	200
SCJD69300NGT■	300
SCJD69400NGT■	400

Ordering Information

Pricing information for all Digital Sentron Series SJD frames is for complete breaker only – price required lugs as separate items – lugs are suitable for 75°C wire.

SJD6 and SCJD6 are acceptable for reverse connection application.

SHJD6 are not acceptable for reverse connection application.

Shipping Weights

Breaker Type	Number per Carton	Shipping Weight (lbs)
SJD6-A	1	20
SHJD6-A	1	20
SCJD6-A	1	33

SJD 400A Frame – 100% Rated^②

Type SJD6-A

Blue Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SJD69200H■	200
SJD69300H■	300
SJD69400H■	400
SJD69200GH■	200
SJD69300GH■	300
SJD69400GH■	400
SJD69200NTH■	200
SJD69300NTH■	300
SJD69400NTH■	400
SJD69200NGTH■	200
SJD69300NGTH■	300
SJD69400NGTH■	400

Type SHJD6-A

Black Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SHJD69200H■	200
SHJD69300H■	300
SHJD69400H■	400
SHJD69200GH■	200
SHJD69300GH■	300
SHJD69400GH■	400
SHJD69200NTH■	200
SHJD69300NTH■	300
SHJD69400NTH■	400
SHJD69200NGTH■	200
SHJD69300NGTH■	300
SHJD69400NGTH■	400

Lugs for 75°C Wire^①

Catalog Number	No of Cables per Connector	Wire Range
TA2J6500	2 2	#3/0-500 kcmil Cu #4/0-500 kcmil Al
TA1L6750	1 1	500–750 kcmil Al 500–600 kcmil Cu
TC1J6600 TC2J6500 TA2J630	1 2 2	#3/0-600 kcmil Cu #3/0-500 kcmil Cu #4–#3/0-Cu/Al
Compression Lug		
CCL600	(1 pc.)	#1/0-500 kcmil Cu/Al

Neutral Transformers

Ampere Rating	Catalog Number
200	N02SJD
300	N03SJD
400	N04SJD

Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instantaneous Setting	Short Time Pick Up	Short Time Delay	Short Time I ² t Pick Up	Ground Fault Pick Up	Ground Fault Delay
None	LI	✓	✓	✓					
G	LIG	✓	✓	✓				✓	✓
NT	LSI	✓	✓	✓	✓	✓	✓		
NGT	LSIG	✓	✓	✓	✓	✓	✓	✓	✓

Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489 (File E10848)		
	240V AC	480V AC	600V AC
SJD6-A	65	35	25
SHJD6-A	100	65	35
SCJD6-A	200	150	100

Note: “G” suffix in catalog number denotes circuit breaker for 3-phase, 3-wire systems.
For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

■ Built to order. Allow 2–3 weeks for delivery.

①For additional information, see **Note: A**, page 17/101.
②Refer to the NEC for proper application of 100% rated devices.

Accessories pages 17-72 and 17/108 to 17/113

Molded Case Circuit Breakers

Internal Accessories

Selections

Accessories for:

JD 400A Frame
LD 600A Frame
LMD 800A Frame
SJD 400A Frame
SLD 600A Frame



Sensitrip Ammeter



The Ammeter Display Units plug into the Sensitrip Trip Unit and displays the phase current flowing in the breaker. They are powered by the breaker's CT's with replaceable battery back-up for maintaining trip and max logs.

The SADU reads currents, current imbalance, current demand, and trip status.

Ammeter Mounting Kit

The Ammeter may also be panel or door mounted using the SADURMK18 remote mounting kit.

Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
24		S17JLD6	—
48		S18JLD6▲	—
120		S01JLD6	S01JLD62A
240		S03JLD6	S03JLD62A
277		S15JLD6▲	S15JLD64A▲
480		S04JLD6	—
	12	S16JLD6▲	S16JLD62A▲
	24	S07JLD6	S07JLD62A
	48	S09JLD6▲	S09JLD62A
	125	S11JLD6	S11JLD62A▲
	250	S13JLD6▲	S13JLD62A▲

Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01JLD6	U01JLD62A	U01JLD62AA
208		U02JLD6▲	U02JLD62A▲	U02JLD62AA▲
240		U03JLD6	U03JLD62A	U03JLD62AA▲
480		U06JLD6	U06JLD64A▲	U06JLD64AA▲
	24	U13JLD6	U13JLD62A	U13JLD62AA
	48	U14JLD6▲	U14JLD62A▲	U14JLD62AA▲
	125	U10JLD6▲	U10JLD62A▲	U10JLD62AA▲
	250	U12JLD6▲	U12JLD62A▲	U12JLD62AA▲

Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01JLD64	A02JLD64
—	12	A01JLDLV	A02JLDLV

Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
480	250	B01JLD64	A01JLD64B	A02JLD64B

Plug-in Ammeter Display Units

Breaker Type	Description	Catalog Number
SJD, SLD	Display Unit	SADU
	Remote Mounting Kit	SADURMK18

Note: Accessory modules can only be added to right side pole of solid state SJD and SLD frame circuit breakers. No accessories can be added if mechanical interlock is used. All accessories on this page are useable on superseded JD2, JJ6, JL6, HJ6, SJL, LJ6, LL6, HL6 and SLL circuit breakers.

▲ Built to order. Allow 6–8 weeks for delivery.

Sentron Molded Case Circuit Breakers

LD 600A Frame Sentron Series

Selection

Type LXD6-A^{①④}

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)				
Continuous Current Rating @ 40°C	2-Pole (3-Pole Width)		3-Pole	
	600V AC	250V DC	600V AC	500V DC
	Catalog Number		Catalog Number	
	450	LXD62B450■	LXD63B450	
500	LXD62B500■	LXD63B500		
600	LXD62B600	LXD63B600		

Type LD6-A^④

Blue Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

2-Pole 600V AC, 250V DC (3-Pole Width)

250	LD62B250■	LD62F600	JD62T250■
300	LD62B300■		JD62T300■
350	LD62B350■		JD62T350■
400	LD62B400		JD62T400
450	LD62B450■		LD62T450■
500	LD62B500■		LD62T500■
600	LD62B600		LD62T600

3-Pole 600V AC, 500V DC^②

250	LD63B250	LD63F600	JD63T250
300	LD63B300		JD63T300
350	LD63B350		JD63T350
400	LD63B400		JD63T400
450	LD63B450		LD63T450
500	LD63B500		LD63T500
600	LD63B600		LD63T600

Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)						IEC 947-2					
	UL 489 AIR (File E10848)											
	Volts AC (50/60Hz)			Volts DC			Volts AC (50/60Hz)					
	240	480	600	250	500 ^③		220/240	380/415	500			
							(Icu)	(Ics)	(Icu)	(Ics)	(Icu)	(Ics)
LD6-A, LXD6-A	65	35	25	30 (2-P)	25 (3-P)		65	33	40	20	—	—
HLD6-A, HLXD6-A	100	65	35	30 (2-P)	35 (3-P)		100	50	65	33	—	—
HHL6, HHLXD6	200	100	50	—	—		—	—	—	—	—	—
CLD6-A	200	150	100	—	50 (3-P)		—	—	—	—	—	—

Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values							
	±20% Tolerance Low	2	3	4	5	6	7	±20% Tolerance High
250-300	1250	1430	1610	1790	1960	2140	2320	2500
350-450	2000	2290	2570	2860	3140	3430	3710	4000
500-600	3000	3430	3800	4290	4710	5140	5570	6000

■ Built to order. Allow 2-3 weeks for delivery.

①Type LXD6A circuit breakers are UL Listed for reverse fed applications.

②When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

③ See Note: A, page 17/101.

④ HACR rated.

Note: LD frame qualified to UL489 supplement SB "NAVAL". See page 17/104 for additional information.

Modifications page 17/104
Accessories pages 17/76 and 17/108 to 17/113

Ordering Information

Complete Breaker Unassembled with Lugs

Prices of LD6, HLD6, and HHL6 breakers include frame, trip, and both line and load lugs (TA2J6500). When ordered by these catalog numbers, the customer will receive the frame, trip and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

Complete Breaker Assembled without Lugs

Prices of LXD6, HLXD6, HHLXD6, and CLD6 include frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA2J6500) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).

100% Rated (3-pole only)

Types LXD6 and HLXD6 breakers are available with 100% ratings. To order add suffix "H" to catalog number, and 10% to list price. 100% rated LD breakers require the use of 90°C Cu cable sized at 75°C ampacity and lugs TC1J6600 or TC2J6500.

50°C Applications see page 17/104.

400Hz Applications see page 17/104.

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
LXD6, LD6, HLD6, HHL6 Assembled Breaker (less terminals)		
2	1	17.5
3	1	19.5
LD6, HLD6, HHL6 Frame Only		
2	1	14
3	1	15.5
LD6, HHL6 Trip Unit Only		
2	1	3.5
3	1	4
CLD6 Complete Assembled Breaker (less terminals)		
3	1	31.5

Lugs For 75°C Wire^③

Catalog Number	Cables per Lug	Wire Range
TA2J6500	1, 2	#3/0 500 kcmil Cu #4/0 500 kcmil Al
TC2J6500	2	#3/0-500 kcmil Cu
TA1L6750	1	500-750 kcmil Al 500-600 kcmil Cu
TC1J6600	1	#3/0-600 kcmil Cu
Compression Lug		
CCL600	1	500 kcmil Cu/Al

Sentron Molded Case Circuit Breakers

LD 600A Frame Sentron Series

Selection/Dimensions

Type HLD6-A, HLXD6-A^{②③⑥}

Black Label

Interchangeable Trip

Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

2-Pole 600V AC, 250V DC (3-Pole Width)

250	HLD62B250■	HLD62F600■	JD62T250■
300	HLD62B300■		JD62T300■
350	HLD62B350■		JD62T350■
400	HLD62B400■		JD62T400■
450	HLD62B450■		LD62T450■
500	HLD62B500■		LD62T500■
600	HLD62B600■		LD62T600■

3-Pole 600V AC, 500V DC^{①⑤}

250	HLD63B250■	HLD63F600■	JD63T250■
300	HLD63B300■		JD63T300■
350	HLD63B350■		JD63T350■
400	HLD63B400■		JD63T400■
450	HLD63B450■		LD63T450■
500	HLD63B500■		LD63T500■
600	HLD63B600■		LD63T600■

Type HHLD6, HHLXD6^{②③⑥}

Black Label

2-Pole 600V AC (3-Pole Width)

250	HHLD62B250■	HHLD62F600■	JD62T250■
300	HHLD62B300■		JD62T300■
350	HHLD62B350■		JD62T350■
400	HHLD62B400■		JD62T400■
450	HHLD62B450■		HHLD62T450■
500	HHLD62B500■		HHLD62T500■
600	HHLD62B600■		HHLD62T600■

3-Pole 600V AC

250	HHLD63B250■	HHLD63F600■	JD63T250■
300	HHLD63B300■		JD63T300■
350	HHLD63B350■		JD63T350■
400	HHLD63B400■		JD63T400■
450	HHLD63B450■		HHLD63T450■
500	HHLD63B500■		HHLD63T500■
600	HHLD63B600■		HHLD63T600■

Type CLD6-A^{③⑥}

Fuseless Current Limiting

Red Label

Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)

Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC	3-Pole 600V AC/500V DC
	Catalog Number	Catalog Number
450	For 2-pole application use outside poles of 3-pole circuit breaker	CLD63B450■
500		CLD63B500■
600		CLD63B600■

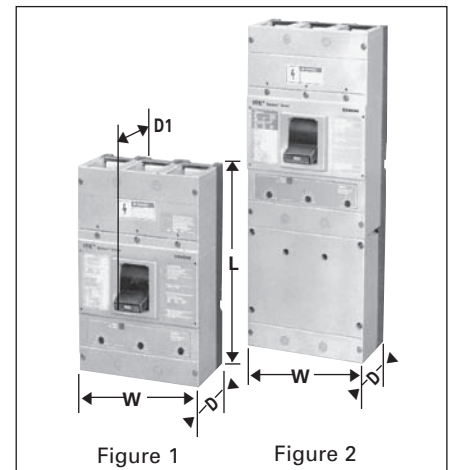


Figure 1

Figure 2

Dimensions (in inches)

Breaker Type	W	L	D	To Handle D1
Figure 1 LXD6-A, LD6-A HLD6-A HHLD6, HHLXD6, LXD6-ETI ^⑥ , SLD6, SHLD6	7.5	11	4	5.44
Figure 2 CLD6, CLD6-ETI ^⑥ , SCLD6	7.5	17.86	4	5.44

Enclosures: (except SCLD6)

Type	Catalog Number
1	LD6N1
3R	LD6N3R
12	LD6N12
4X	LD6SS4
7,9	ED6
Neutral	W60993

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2–3 weeks for delivery.

① When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

② For complete assembled 3-pole HLD6 or HHLD6 type circuit breaker change the prefix identifier HLD6 or HHLD6 to HLXD6 or HHLXD6. Price is sum of frame and trip units prices, e.g. price of HLXD63B400 is the price of HLD63F600 plus the price of LD63T600. Order the terminal connectors separately.

③ Type HLXD6, HHLXD6, & CLD6 Circuit Breakers are UL Listed for reverse feed applications.
④ LXD6-ETI, CLD6-ETI see page 17/91 for ordering information.
⑤ CE Applies to non-interchangeable type HLXD only.
⑥ HACR rated.

Sentron Molded Case Circuit Breakers

SLD 600A Frame Digital Solid State Sentron Sensitrip III Series

Selection

Type SLD6-A

Blue Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SLD69300■	300
SLD69400■	400
SLD69500■	500
SLD69600■	600
SLD69300G■	300
SLD69400G■	400
SLD69500G■	500
SLD69600G■	600
SLD69300NT■	300
SLD69400NT■	400
SLD69500NT■	500
SLD69600NT■	600
SLD69300NGT■	300
SLD69400NGT■	400
SLD69500NGT■	500
SLD69600NGT■	600

Type SHLD6-A

Black Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SHLD69300■	300
SHLD69400■	400
SHLD69500■	500
SHLD69600■	600
SHLD69300G■	300
SHLD69400G■	400
SHLD69500G■	500
SHLD69600G■	600
SHLD69300NT■	300
SHLD69400NT■	400
SHLD69500NT■	500
SHLD69600NT■	600
SHLD69300NGT■	300
SHLD69400NGT■	400
SHLD69500NGT■	500
SHLD69600NGT■	600

Current Limiting

Type SCLD6-A

Red Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SCLD69300■	300
SCLD69400■	400
SCLD69500■	500
SCLD69600■	600
SCLD69300G■	300
SCLD69400G■	400
SCLD69500G■	500
SCLD69600G■	600
SCLD69300NT■	300
SCLD69400NT■	400
SCLD69500NT■	500
SCLD69600NT■	600
SCLD69300NGT■	300
SCLD69400NGT■	400
SCLD69500NGT■	500
SCLD69600NGT■	600

Ordering Information

Pricing information for all Digital Sentron Series SLD frames is for complete breaker only – price required lugs as separate items – lugs are suitable for 75° C wire.

SLD6 and SCLD6 are suitable for reverse connection application.

SHLD6 are not suitable for reverse connection application.

Shipping Weights

Breaker Type	Number per Carton	Shipping Weight (lbs)
SLD6-A	1	20
SHLD6-A	1	20
SCLD6-A	1	33

Neutral Transformers

Ampere Rating	Catalog Number
300	N03SJD
400	N04SJD
500	N05SLD
600	N06SLD

Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instantaneous Setting	Short Time Pick Up	Short Time Delay	Short Time I ² t Pick Up	Ground Fault Pick Up	Ground Fault Delay
None	LI	✓	✓	✓					
G	LIG	✓	✓	✓				✓	✓
NT	LSI	✓	✓	✓	✓	✓	✓		
NGT	LSIG	✓	✓	✓	✓	✓	✓	✓	✓

Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489 (File E10848)		
	240V AC	480V AC	600V AC
SLD6-A	65	35	25
SHLD6-A	100	65	35
SCLD6-A	200	150	100

Note: "G" suffix in catalog number denotes circuit breaker for 3-phase, 3-wire circuits.
For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

For ordering information and terminal connectors see page 17/73; for enclosures, see page 17/74.

100% Rated – Not available in SLD6 Frame.

■ Built to order. Allow 2–3 weeks for delivery.

Molded Case Circuit Breakers

Internal Accessories

Selection

Accessories for:

JD 400A Frame
LD 600A Frame
LMD 800A Frame
SJD 400A Frame
SLD 600A Frame



Sensitrip Ammeter



The Ammeter Display Units plug into the Sensitrip Trip Unit and displays the phase current flowing in the breaker. They are powered by the breaker's CT's with replaceable battery back-up for maintaining trip and max logs.

The SADU reads currents, current imbalance, current demand, and trip status.

Ammeter Mounting Kit

The Ammeter may also be panel or door mounted using the SADURMK18 remote mounting kit.

Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
24		S17JLD6	—
48		S18JLD6▲	—
120		S01JLD6	S01JLD62A
240		S03JLD6	S03JLD62A
277		S15JLD6▲	S15JLD64A▲
480		S04JLD6	—
	12	S16JLD6▲	S16JLD62A▲
	24	S07JLD6	S07JLD62A
	48	S09JLD6▲	S09JLD62A
	125	S11JLD6	S11JLD62A▲
	250	S13JLD6▲	S13JLD62A▲

Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01JLD6	U01JLD62A	U01JLD62AA
208		U02JLD6▲	U02JLD62A▲	U02JLD62AA▲
240		U03JLD6	U03JLD62A▲	U03JLD62AA▲
480		U06JLD6	U06JLD64A▲	U06JLD64AA▲
	24	U13JLD6	U13JLD62A	U13JLD62AA
	48	U14JLD6▲	U14JLD62A▲	U14JLD62AA▲
	125	U10JLD6▲	U10JLD62A▲	U10JLD62AA▲
	250	U12JLD6▲	U12JLD62A▲	U12JLD62AA▲

Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01JLD64	A02JLD64
—	12	A01JLDLV	A02JLDLV

Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
480	250	B01JLD64	A01JLD64B	A02JLD64B

Plug-in Ammeter Display Units

Breaker Type	Description	Catalog Number
SJD, SLD	Display Unit	SADU
	Remote Mounting Kit	SADURMK18

Note: Accessory modules can only be added to right side pole of solid state SJD and SLD frame circuit breakers. No accessories can be added if mechanical interlock is used. All accessories on this page are useable on superseded JD2, JJ6, JL6, HJ6, SJL, LJ6, LL6, HL6 and SLL circuit breakers.

▲ Built to order. Allow 6-8 weeks for delivery.

Sentron Molded Case Circuit Breakers

LMD 800A Frame Sentron Series

Selection/Dimensions

Type LMXD6^{①④}

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)		
Continuous Current Rating @ 40°C	2-Pole (3-Pole Width) Catalog Number	3-Pole Catalog Number
500	—	LMXD63B500■
600	LMXD62B600■	LMXD63B600
700	LMXD62B700■	LMXD63B700
800	LMXD62B800	LMXD63B800

Type LMD6^④

Blue Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number

2-Pole 600V AC, 250V DC (3-Pole Width)

500	LMD62B500■	LMD62F800■	LMD62T500■
600	LMD62B600■		LMD62T600■
700	LMD62B700■		LMD62T700■
800	LMD62B800■		LMD62T800■

3-Pole 600V AC, 500V DC^②

500	LMD63B500■	LMD63F800	LMD63T500■
600	LMD63B600■		LMD63T600■
700	LMD63B700■		LMD63T700■
800	LMD63B800		LMD63T800

Instantaneous Adjustment Trip Range

Ampere Rating	Nominal Instantaneous Values							
	Low +/- 20% Tolerance	2	3	4	5	6	7	High +/- 20% Tolerance
500-600	3000	3430	3860	4290	4710	5140	5570	6000
700-800	3200	3500	3700	4200	4700	6400	7300	8000

Ordering Information

Complete Breaker Unassembled with Lugs

Prices of LMD6 and HLMXD6 breakers include frame, trip, and both line and load lugs (TA3K500). These catalog numbers include the frame, trip and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

Complete Breaker Assembled without Lugs

Prices of LMD6 and HLMXD6 include frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA3K500) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).

50°C Applications see page 17/104.

400Hz Applications see page 17/104.

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
LMD6, HLMXD6, LMXD6, HLMXD6 Complete Breaker (less terminals)		
2	1	53
3	1	61.5
LMD6, HLMXD6 Frame Only		
2	1	42.25
3	1	46
LMD6, HLMXD6 Trip Unit Only		
2	1	4.5
3	1	6.5

Lugs^③ for 75°C Wire

Catalog Number	Cables per Lug	Wire Range
TA2K500	1, 2	#1-500 kcmil Cu/Al
TA3K500	1-3	#1/0-500 kcmil Cu/Al
TA2N750	1, 2	500-750 kcmil Cu/Al

■ Built to order. Allow 2-3 weeks for delivery.

① LMXD6 circuit breakers are UL Listed for reverse connected applications.

② When wired as shown on page 17-5, this circuit breaker is UL listed and rated for use on 500VDC ungrounded UPS systems only.

③ See **Note: A**, page 17/101.

④ HACR rated.

Modifications page 17/104
Accessories pages 17/79 and 17/108 to 17/113

Sentron Molded Case Circuit Breakers

LMD 800A Frame Sentron Series

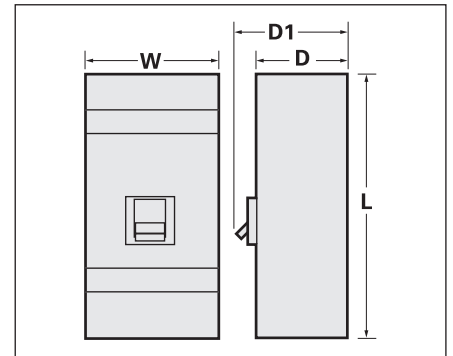
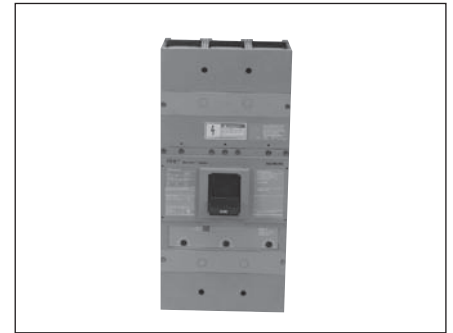
Selection/Dimensions

Type HLMXD6 ^{①④}		Black Label
Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)		
Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC Catalog Number	3-Pole 600V AC/500V DC Catalog Number
500	For 2-pole application use outside poles of 3-pole circuit breaker	HLMXD63B500■
600		HLMXD63B600■
700		HLMXD63B700■
800		HLMXD63B800

Type HLMD6④		Black Label	
Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number
2-Pole 600V AC, 250V DC (3-Pole Width)			
500	HLMD62B500■	HLMD62F800■	LMD62T500■
600	HLMD62B600■		LMD62T600■
700	HLMD62B700■		LMD62T700■
800	HLMD62B800■		LMD62T800■
3-Pole 600V AC, 500V DC③			
500	HLMD63B500	HLMD63F800	LMD63T500■
600	HLMD63B600		LMD63T600■
700	HLMD63B700		LMD63T700■
800	HLMD63B800		LMD63T800

Interrupting Ratings

Breaker Type	UL 489A IR				
	RMS Symmetrical Amperes (KA)				
	Volts AC			Volts DC	
	240	480	600	250	500 ^④
LMD6, LMXD6	65	50	25	30 (2-P)	25 (3-P)
HLMD6, HLMXD6	100	65	50	30 (2-P)	50 (3-P)



Dimensions (in inches)

Breaker Type	W	L	D	D1
LMD6, LMXD6, HLMD6, HLMXD6 LMXD6-ETI ^②	7.5	16	4.5	5.93

Enclosures

Type	Catalog Number
1	LMD1
3R	LMD3R
12	LMD12■
Neutral	W63623

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2–3 weeks for delivery.

①HLMXD6 circuit breakers are UL Listed for reverse connection applications.

②LMXD6-ETI, see page 17/91 for catalog information.

③ When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500VDC ungrounded UPS systems only.

④ HACR rated.

Accessories for:

JD 400A Frame
LD 600A Frame
LMD 800A Frame
SJD 400A Frame
SLD 600A Frame



Sensitrip Ammeter



The Ammeter Display Units plug into the Sensitrip Trip Unit and displays the phase current flowing in the breaker. They are powered by the breaker's CT's with replaceable battery back-up for maintaining trip and max logs.

The SADU reads currents, current imbalance, current demand, and trip status.

Ammeter Mounting Kit

The Ammeter may also be panel or door mounted using the SADURMK18 remote mounting kit.

Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
24		S17JLD6	—
48		S18JLD6▲	—
120		S01JLD6	S01JLD62A
240		S03JLD6	S03JLD62A
277		S15JLD6▲	S15JLD64A▲
480		S04JLD6	—
	12	S16JLD6▲	S16JLD62A▲
	24	S07JLD6	S07JLD62A
	48	S09JLD6▲	S09JLD62A
	125	S11JLD6	S11JLD62A▲
	250	S13JLD6▲	S13JLD62A▲

Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01JLD6	U01JLD62A	U01JLD62AA
208		U02JLD6▲	U02JLD62A▲	U02JLD62AA▲
240		U03JLD6	U03JLD62A▲	U03JLD62AA▲
480		U06JLD6	U06JLD64A▲	U06JLD64AA▲
	24	U13JLD6	U13JLD62A	U13JLD62AA
	48	U14JLD6▲	U14JLD62A▲	U14JLD62AA▲
	125	U10JLD6▲	U10JLD62A▲	U10JLD62AA▲
	250	U12JLD6▲	U12JLD62A▲	U12JLD62AA▲

Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01JLD64	A02JLD64
—	12	A01JLDLV	A02JLDLV

Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
480	250	B01JLD64	A01JLD64B	A02JLD64B

Plug-in Ammeter Display Units

Breaker Type	Description	Catalog Number
SJD, SLD	Display Unit	SADU
	Remote Mounting Kit	SADURMK18

Note: Accessory modules can only be added to right side pole of solid state SJD and SLD frame circuit breakers. No accessories can be added if mechanical interlock is used. All accessories on this page are useable on superseded JD2, JJ6, JL6, HJ6, SJL, LJ6, LL6, HL6 and SLL circuit breakers.

▲ Built to order. Allow 6–8 weeks for delivery.

Sentron Molded Case Circuit Breakers

MD 800A Frame Sentron Series

Selection

Type MXD6 ^{①⑥}		Blue Label
Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)		
Continuous Current Rating @ 40°C	2-Pole ^②	3-Pole
	Catalog Number	Catalog Number
600	MXD62B600■	MXD63B600
700	MXD62B700■	MXD63B700
800	MXD62B800■	MXD63B800

Type MD6 ^⑥			Blue Label
Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled with Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

2-Pole 600V AC, 250V DC^②

500	MD62B500■	MD62F800■	MD62T500■
600	MD62B600■		MD62T600■
700	MD62B700■		MD62T700■
800	MD62B800■		MD62T800■

3-Pole 600V AC, 500V DC^③

500	MD63B500	MD63F800	MD63T500
600	MD63B600		MD63T600
700	MD63B700		MD63T700
800	MD63B800		MD63T800

Lugs^④

Catalog Number	Cables Per Lug	Lugs Per Kit	Wire Range
TA2K500	1-2	1	#1-500 kcmil Cu/Al
TA3K500	1-3	1	1/0-500 kcmil Cu/Al
TC2K500	1-2	1	#1-500 kcmil Cu
TC3K350	1-3	1	#1-350 kcmil Cu
Kits			
2TA2N8750	1-2	2	500-750 kcmil Cu/Al
3TA2N8750		3	
2TA3N8750	1-3	2	500-750 kcmil Cu/Al
3TA3N8750		3	
2TA4N8500	1-4	2	250-500 kcmil Cu/Al
3TA4N8500		3	
2TA4P8500	1-4	2	250-500 kcmil Cu/Al
3TA4P8500		3	

Instantaneous Adjustment Trip Range

Ampere Rating	Nominal Instantaneous Values							
	Low +/- 20% Tolerance	2	3	4	5	6	7	High +/- 20% Tolerance
500	3000	3430	3860	4280	4710	5140	5570	6000
600-800	4000	4570	5140	5710	6280	6850	7420	8000

■ Built to order. Allow 2-3 weeks for delivery.

①MXD6 circuit breakers are UL Listed for reverse connection applications.

②2-pole units available in 3-pole width only.

③ When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems.

④ See **Note: A**, page 17/101.

⑤ 80% rated breakers with the CE mark will also be marked in the 100% rated version.

⑥ HACR rated.

Note: MD frame qualified to UL489 supplement B "NAVAL". See page 17/104 for additional information.

Ordering Information

Complete Breaker Unassembled with Lugs

Pricing information for MD6 and HMD6 breakers includes frame, trip, and both line and load lugs (TA3K500). When ordered by these catalog numbers, the customer will receive the frame, trip and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

Complete Breaker Assembled without Lugs

Prices of MXD6, HMXD6 and CMD6 include frame with non-interchangeable trip units installed only. Order required lugs separately. For line and load lugs (TA3K500) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).

100% Rated^⑤

Types MXD6, HMXD6 and CMD6 breakers are available with 100% ratings. To order add suffix "H" to catalog number, and 10% to list price. 100% rated MD breakers require the use of 90°C Cu cable sized at 75°C ampacity and lugs 3TA4P8500 or 3TA2N8750.

50°C Applications see page 17/104.

400Hz Applications see page 17/104.

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
MD6, HMD6, HMXD6, CMD6 Complete Breaker Assembled (less lugs)		
2	1	53
3	1	61.5
MD6, HMD6 Frame Only		
2	1	42.25
3	1	46
MD6, HMD6 Trip Unit Only		
2	1	4.5
3	1	6.5

Enclosures

Type	Catalog Number
1	MND61
3R	MND63
12	MND612■
Neutral	W63623

Modifications page 17/104

Accessories pages 17/79 and 17/108 to 17/113

Sentron Molded Case Circuit Breakers

MD 800A Frame Sentron Series

Selection/Dimensions

Type HMXD6^{①⑤}

Black Label

Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)

Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC	3-Pole 600V AC/500V DC
	Catalog Number	Catalog Number
600	For 2-pole application use outside poles of 3-pole circuit breaker	HMXD63B600■
700		HMXD63B700■
800		HMXD63B800

Type HMD6^⑤

Black Label

Interchangeable Trip

Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

2-Pole 600V AC, 250V DC^②

500	HMD62B500■	HMD62F800■	MD62T500■
600	HMD62B600■		MD62T600■
700	HMD62B700■		MD62T700■
800	HMD62B800■		MD62T800■

3-Pole 600V AC, 500V DC^④

500	HMD63B500	HMD63F800	MD63T500
600	HMD63B600		MD63T600
700	HMD63B700		MD63T700
800	HMD63B800		MD63T800

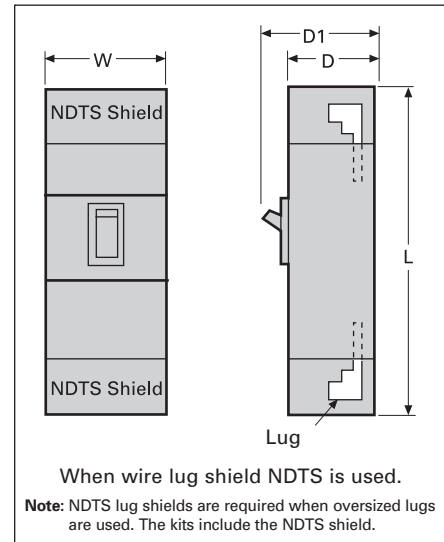
Type CMD6^{①⑤}

Fuseless Current Limiting

Red Label

Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)

Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC	3-Pole 600V AC/500V DC
	Catalog Number	Catalog Number
600	For 2-pole application use outside poles of 3-pole circuit breaker	CMD63B600■
700		CMD63B700■
800		CMD63B800



Dimensions (in inches)

Breaker Type	W	L	D	(To Handle) D1
MD6, MXD6, HMD6, HMXD6, CMD6, MXD6-ETI, CMD6-ETI, SMD6, SHMD6, and SCMD6	9	16	6	8.25
with lug shields	9	24	6	8.25

Interrupting Ratings

Breaker Type	UL 489 AIR—File E10848					IEC 947-2 AIR					
	RMS Symmetrical Amperes (KA)					Volts AC (50/60HZ)					
	Volts AC			Volts DC		220/240		380/415		500	
	240	480	600	250	500 ^③	(Icu)	(Ics)	(Icu)	(Ics)	(Icu)	(Ics)
MD6, MXD6	65	50	25	30 (2-P)	25 (3-P)	65	33	40	20	—	—
HMD6, HMXD6	100	65	50	30 (2-P)	50 (3-P)	100	50	65	33	—	—
CMD6	200	100	65	—	50 (3-P)	—	—	—	—	—	—

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2–3 weeks for delivery.

①HMXD6 and CMD circuit breakers are UL listed for reverse connection applications.

②2-pole units available in 3-pole width only.

③MXD6-ETI, CMD6-ETI see page 17/91 for catalog information.

④When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

⑤ HACR rated.

Sentron Molded Case Circuit Breakers

SMD 800A Frame Digital Solid State Sentron Sensitrip III Series[®]

Selection

Type SMD6

Blue Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SMD69600A■	600
SMD69700A■	700
SMD69800A■	800
SMD69600AG■	600
SMD69700AG■	700
SMD69800AG■	800
SMD69600ANT■	600
SMD69700ANT■	700
SMD69800ANT■	800
SMD69600ANGT■	600
SMD69700ANGT■	700
SMD69800ANGT■	800

Type SHMD6

Black Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SHMD69600A■	600
SHMD69700A■	700
SHMD69800A■	800
SHMD69600AG■	600
SHMD69700AG■	700
SHMD69800AG■	800
SHMD69600ANT■	600
SHMD69700ANT■	700
SHMD69800ANT■	800
SHMD69600ANGT■	600
SHMD69700ANGT■	700
SHMD69800ANGT■	800

Current Limiting

Type SCMD6-A

Red Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SCMD69600A■	600
SCMD69700A■	700
SCMD69800A■	800
SCMD69600AG■	600
SCMD69700AG■	700
SCMD69800AG■	800
SCMD69600ANT■	600
SCMD69700ANT■	700
SCMD69800ANT■	800
SCMD69600ANGT■	600
SCMD69700ANGT■	700
SCMD69800ANGT■	800

Ordering Information

Pricing information for all Digital Sentron Series MD frames is for complete breaker only. Price requires lugs or lug kits as separate items. Lugs are suitable for 75°C wire or as noted. Connector wire ranges and cavities are established in conjunction with Table 6.1.4.2.1 of UL 489 standards. Choose actual connector for circuit breakers based on customer requirements.

Recommended Terminal Connectors

Breaker Frame	Ampere Rating	Connector or Connector Kit
MD	500–600	TA2K500
MD	700–800	TA3K500

Types SMD6 and SHMD6 are acceptable for reverse connection applications.

SMD 800A Frame – 100% Rated^①

Type SMD6

Blue Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SMD69600AH■	600
SMD69700AH■	700
SMD69800AH■	800
SMD69600AGH■	600
SMD69700AGH■	700
SMD69800AGH■	800
SMD69600ANTH■	600
SMD69700ANTH■	700
SMD69800ANTH■	800
SMD69600ANGTH■	600
SMD69700ANGTH■	700
SMD69800ANGTH■	800

Type SHMD6

Black Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SHMD69600AH■	600
SHMD69700AH■	700
SHMD69800AH■	800
SHMD69600AGH■	600
SHMD69700AGH■	700
SHMD69800AGH■	800
SHMD69600ANTH■	600
SHMD69700ANTH■	700
SHMD69800ANTH■	800
SHMD69600ANGTH■	600
SHMD69700ANGTH■	700
SHMD69800ANGTH■	800

Current Limiting

Type SCMD6-A

Red Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SCMD69600AH■	600
SCMD69700AH■	700
SCMD69800AH■	800
SCMD69600AGH■	600
SCMD69700AGH■	700
SCMD69800AGH■	800
SCMD69600ANTH■	600
SCMD69700ANTH■	700
SCMD69800ANTH■	800
SCMD69600ANGTH■	600
SCMD69700ANGTH■	700
SCMD69800ANGTH■	800

Shipping Weights

Breaker Type	Number per Carton	Shipping Weight (lbs)
All types	1	61.5

Lugs for 75°C Wire^②

Catalog Number	Cables per Lug	Wire Range
TA2K500	2	#1-500 kcmil Cu/Al
TA3K500	3	#1-500 kcmil Cu/Al
TC2K500	2	#1-500 kcmil Cu
TC3K350	3	#1-350 kcmil Cu

Kits (3 lugs/kits)

3TA4N8500	4	250–500 kcmil Cu/Al
3TA4P8500	4	250–500 kcmil Cu/Al
3TA2N8750	2	500–750 kcmil Cu/Al
3TA3N8750	3	500–750 kcmil Cu/Al

Each kit contains the following:
3TA4P8500—3 connectors plus 1 NDTs end barrier
3TA3N8750—3 connectors plus 1 NDTs end barrier
3TA2N8750—3 connectors plus 1 NDTs end barrier

Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instantaneous Setting	Short Time Pick Up	Short Time Delay	Ground Fault Pick Up	Ground Fault Delay
A	LI	✓	✓	✓				
AG	LIG	✓	✓	✓			✓	✓
ANT	LSI	✓	✓	✓	✓	✓		
ANGT	LSIG	✓	✓	✓	✓	✓	✓	✓

Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489 (File E10848)		
	240V AC	480V AC	600V AC
SMD6	65	50	25
SHMD6	100	65	50
SCMD6	200	100	65

Note: “G” suffix in catalog number denotes circuit breaker for 3-phase, 3-wire circuits.
For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

■ Built to order. Allow 2–3 weeks for delivery.

① Use 2-3TA4P8500 for 3-pole. These kits are rated for 90°C wire. 90°C Cu only cable must be used, and sized per 75°C ampacity.

② For additional information, see **Note: A**, page 17/101.

③ SMD6, SHMD6 and SCMD6 circuit breakers are UL Listed for reverse connection applications.

Neutral Transformers

Ampere Rating	Catalog Number
600	N06SMDA
700	N07SMDA
800	N08SMDA

Enclosures

Type	Catalog Number
1	MND61
3R	MND63
12	MND612
Neutral	W63623

Accessories pages 17/90 and 17/108 to 17/113

Sentron Molded Case Circuit Breakers

ND 1200A Frame Sentron Series

Selection

Type NXD6^{①⑧}

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)		
Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC Catalog Number	3-Pole 600V AC/500V DC Catalog Number
900	NXD62B900■	NXD63B900
1000	NXD62B100■	NXD63B100
1200	NXD62B120■	NXD63B120

Type ND6^⑧

Blue Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled with Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number

2-Pole 600V AC, 250V DC^②

800	ND62B800■	ND62F120	MD62T800■
900	ND62B900■		ND62T900■
1000	ND62B100■		ND62T100■
1200	ND62B120		ND62T120

3-Pole 600V AC, 500V DC^③

800	ND63B800	ND63F120	MD63T800
900	ND63B900		ND63T900
1000	ND63B100		ND63T100
1200	ND63B120		ND63T120

Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)									
	UL 489 A IR					IEC 947-2				
	Volts AC			Volts DC		Volts AC (50/60HZ)				
	240	480	600	250	500 ^⑤	220/240	380/415	500		
						(lcu)	(lcs)	(lcu)	(lcs)	(lcs)
ND6, NXD6	65	50	25	30 (2-P)	25 (3-P)	65	33	40	20	—
HND6, HNXD6	100	65	50	30 (2-P)	50 (3-P)	100	50	65	33	—
CND6	200	100	65	—	50 (3-P)	—	—	—	—	—

Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values							
	±20% Tolerance Low	2	3	4	5	6	7	±20% Tolerance High
800	4000	4570	5140	5710	6280	6850	7420	8000
900-1200	5000	5715	6430	7145	7860	8575	9290	10000

■ Built to order. Allow 2-3 weeks for delivery.

①NXD6 circuit breakers are UL listed for reverse connection applications.

②2-pole units available in 3-pole width only.

③When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500VDC ungrounded UPS systems only.

④Use 2 – 3TA4P8500 kits for 3-pole, or 2 – 2TA4P8500 kits for 2-pole. Rated for 90° C cable. Use for 100% rated breakers.

⑤Use 2 – 3TA4N8500 for 3-pole or 2 – 2TA4N8500 for 2-pole. Rated for 75°C cable.

⑥See **Note: A**, page 17/101.

⑦80% rated breakers with the CE mark will also be marked in the 100% rated version.

⑧HACR rated.

Note: ND frame qualified to UL489 supplement B “NAVAL”. See page 17/104 for additional information.

Ordering Information

Complete Breaker Unassembled with Lugs

Prices of ND6 and HND6 breakers include frame, trip, and both line and load lugs (3TA4N8500). These catalog numbers are the frame, trip and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

Complete Breaker Assembled without Lugs

Prices of NXD6, HNXD6, and CND6 include frame with non-interchangeable trip units installed only. Order required terminal connectors separately. For line and load lugs (3TA4N8500) installed, add suffix “L” to catalog number (add 2 times list price of lug kit).

100% Rated (3-Pole only)^⑦

Types NXD6, HNXD6 and CND6 breakers are available with 100% ratings. To order, add suffix “H” to catalog number, and add 10% to list price. 100% rated ND breakers require 90°C Cu cable sized at 75°C ampacity and lug kit 3TA4P8500 or 3TA3N8750.

50°C Applications see page 17/104.

400Hz Applications see page 17/104.

Lugs^⑥

Catalog Number	Cables per Lug	Wire Range
TA2K500	2	#1-500 kcmil Cu/Al
TA3K500	3	#1-500 kcmil Cu/Al
TC2K500	2	#1-500 kcmil Cu
TC3K500	3	#1-350 kcmil Cu

Kits (2 Kits required per breaker)

2TA4P8500 ^④ 3TA4P8500 ^④	4	250-500 kcmil Cu/Al
2TA4N8500 ^⑤ 3TA4N8500 ^⑤	4	250-500 kcmil Cu/Al
2TA2N8750 3TA2N8750	2	500-750 kcmil Cu/Al
2TA3N8750 3TA3N8750	3	500-750 kcmil Cu/Al

Enclosures

Type	Catalog Number
1	MND61
3R	MND63
12	MND612■
Neutral	W63623

Modifications page 17/104

Accessories pages 17/86 and 17/108 to 17/113

Sentron Molded Case Circuit Breakers

ND 1200A Frame Sentron Series

Selection/Dimensions

Type HNXD6 ^{①④}		Black Label
Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)		
Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC	3-Pole 600V AC/500V DC
	Catalog Number	Catalog Number
900	For 2-pole application use outside poles of 3-pole circuit breaker	HNXD63B900
1000		HNXD63B100
1200		HNXD63B120

Type HND6 ^④			Black Label
Interchangeable Trip			
Continuous Current Rating @ 40°C	Complete Breaker Unassembled with Lugs	Frame Only	Trip Unit Only
	Catalog Number	Catalog Number	Catalog Number

2-Pole 600V AC, 250V DC^②

800	For 2-pole application use outside poles of 3-pole circuit breaker
900	
1000	
1200	

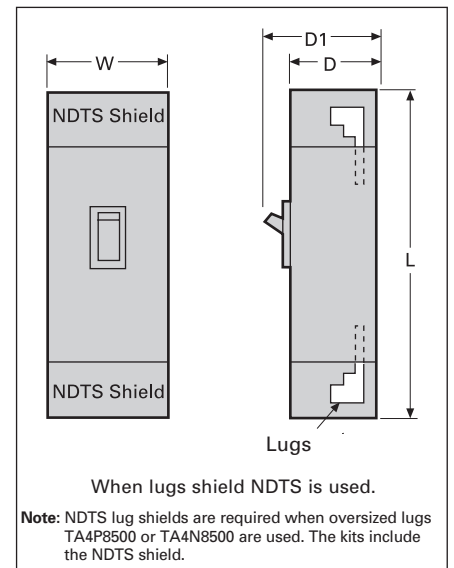
3-Pole 600V AC, 500V DC^③

800	HND63B800	HND63F120	MD63T800
900	HND63B900		ND63T900
1000	HND63B100		ND63T100
1200	HND63B120		ND63T120

Type CND6 ^{①④}		Red Label
Fuseless Current Limiting		
Non-Interchangeable Trip (Assembled Circuit Breaker)		
Continuous Current Rating @ 40°C	2-Pole	3-Pole
	Catalog Number	Catalog Number
900	For 2-pole application, use outside poles of 3-pole circuit breaker	CND63B900■
1000		CND63B100
1200		CND63B120

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
ND6, HND6, NXD6, HNXD6, CND6 Assembled Breaker (less terminals)		
2	1	53
3	1	61.5
ND6, HND6 Frame Only		
2	1	42.25
3	1	46
ND6, HND6 Trip Unit Only		
2	1	4.5
3	1	6.5



Dimensions (in inches)

Breaker Type	W	L	D	D1
ND6, NXD6, HND6, HNXD6, CND6, SND6, SHND6, and SCND6	9	16	6	8.25
with NDTS lug shield	9	24	6	8.25

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2–3 weeks for delivery.

① HNXD6 and CND6 circuit breakers are UL Listed for reverse connection applications.

② 2-pole units available in 3-pole width only.

③ When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

④ HACR rated.

Sentron Molded Case Circuit Breakers

SND 1200A Frame Digital Solid State Sentron Sensitrip III Series^②

Selection

Type SND6

Blue Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SND69800A■	800
SND69100A■	1000
SND69120A■	1200
SND69800AG■	800
SND69100AG■	1000
SND69120AG■	1200
SND69800ANT■	800
SND69100ANT■	1000
SND69120ANT■	1200
SND69800ANGT■	800
SND69100ANGT■	1000
SND69120ANGT■	1200

Type SHND6

Black Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SHND69800A■	800
SHND69100A■	1000
SHND69120A■	1200
SHND69800AG■	800
SHND69100AG■	1000
SHND69120AG■	1200
SHND69800ANT■	800
SHND69100ANT■	1000
SHND69120ANT■	1200
SHND69800ANGT■	800
SHND69100ANGT■	1000
SHND69120ANGT■	1200

Current Limiting

Type SCND6-A

Red Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SCND69800A■	800
SCND69100A■	1000
SCND69120A■	1200
SCND69800AG■	800
SCND69100AG■	1000
SCND69120AG■	1200
SCND69800ANT■	800
SCND69100ANT■	1000
SCND69120ANT■	1200
SCND69800ANGT■	800
SCND69100ANGT■	1000
SCND69120ANGT■	1200



SND 1200A Frame – 100% Rated^①

Type SND6

Blue Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SND69800AH■	800
SND69100AH■	1000
SND69120AH■	1200
SND69800AGH■	800
SND69100AGH■	1000
SND69120AGH■	1200
SND69800ANTH■	800
SND69100ANTH■	1000
SND69120ANTH■	1200
SND69800ANGTH■	800
SND69100ANGTH■	1000
SND69120ANGTH■	1200

Type SHND6

Black Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SHND69800AH■	800
SHND69100AH■	1000
SHND69120AH■	1200
SHND69800AGH■	800
SHND69100AGH■	1000
SHND69120AGH■	1200
SHND69800ANTH■	800
SHND69100ANTH■	1000
SHND69120ANTH■	1200
SHND69800ANGTH■	800
SHND69100ANGTH■	1000
SHND69120ANGTH■	1200

Current Limiting

Type SCND6-A

Red Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SCND69800AH■	800
SCND69100AH■	1000
SCND69120AH■	1200
SCND69800AGH■	800
SCND69100AGH■	1000
SCND69120AGH■	1200
SCND69800ANTH■	800
SCND69100ANTH■	1000
SCND69120ANTH■	1200
SCND69800ANGTH■	800
SCND69100ANGTH■	1000
SCND69120ANGTH■	1200

Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instantaneous Setting	Short Time Pick Up	Short Time Delay	Short Time I ² t Pick Up	Ground Fault Pick Up	Ground Fault Delay
A	LI	✓	✓	✓					
AG	LIG	✓	✓	✓				✓	✓
ANT	LSI	✓	✓	✓	✓	✓	✓		
ANGT	LSIG	✓	✓	✓	✓	✓	✓	✓	✓

Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489 (File E10848)		
	240V AC	480V AC	600V AC
SND6	65	50	25
SHND6	100	65	50
SCND6	200	100	65

Neutral Transformers

Ampere Rating	Catalog Number
800	N08SMDA
1000	N10SNDA
1200	N12SNDA

For inches / millimeters conversion, see Application Data section.

For ordering information and terminal connectors, and enclosures, see page 17/83.

Note: "G" suffix in catalog number denotes circuit breaker for 3-phase, 3-wire circuits.

For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

■ Built to order. Allow 2-3 weeks for delivery.

① Use 2-3TA4P8500 for 3-pole. These kits are rated for 90°C wire. 90°C Cu only cable must be used, and sized per 75°C ampacity.

② SND6, SHND6 and SCND6 circuit breakers are UL Listed for reverse connection applications.

Molded Case Circuit Breaker

Internal Accessories

Selection

Accessories for:

MD/SMD 800A Frame
ND/SND 1200A Frame
PD/SPD 1600A Frame
RD 2000A Frame



Accessory modules can mount in either left hand or right hand poles of all circuit breakers, including solid state. Exception: when mechanical interlock is used. Accessories cannot be mounted in left pole.

Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
120		S01MN6	S01MN64A
208		S02MN6▲	—
240		S03MN6	S03MN64A▲
277		S15MN6▲	S15MN64A▲
480		S04MN6▲	S04MN64A▲
600		S06MN6▲	—
	12	S16MN6▲	S16MN64A▲
	24	S07MN6	S07MN64A
	48	S09MN6▲	—
	125	S11MN6	S11MN64A▲
	250	S13MN6▲	S13MN64A▲

Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01MN6	U01MN64A	U01MN64AA
208		U02MN6▲	U02MN64A▲	U02MN64AA▲
240		U03MN6▲	U03MN64A▲	U03MN64AA▲
277		U15MN6▲	U15MN64A▲	U15MN64AA▲
480		U04MN6▲	U04MN64A▲	U04MN64AA▲
600		U06MN6▲	—	—
	24	U07MN6	U07MN64A	U07MN64AA
	48	U09MN6▲	U09MN64A▲	U09MN64AA▲
	125	U11MN6▲	U11MN64A▲	U11MN64AA▲
	250	U13MN6▲	U13MN64A▲	U13MN64AA▲

Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01MN64	A02MN64
—	12	A01MN64LV▲	A02MN64LV▲

Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
480	250	B00MN64	A01MN64B	A02MN64B

Plug-in Ammeter Display Units

Breaker Type	Description	Catalog Number
SMD, SND, SPD	Display Unit	SADU
	Remote Mounting Kit	SADURMK18

▲ Built to order. Allow 6–8 weeks for delivery.

Sentron Molded Case Circuit Breakers

PD 1600A Frame Sentron Series

Selection

Type PXD6^② Non-Interchangeable Trip^⑤

3-Pole 600V AC, 250-500V DC^①

Blue Label

Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only)	Mounting Assembly	Lugs (6 required)
	Catalog Number	Catalog Number	Catalog Number
1200	PXD63B120■	MB9301	TA5P600
1400	PXD63B140■	-or-	
1600	PXD63B160	MBR9302	

Type PD6 Interchangeable Trip^⑤

3-Pole 600V AC, 250-500V DC^①

Blue Label

Continuous Current Rating @ 40°C	Complete Breaker Unassembled	Frame Only	Trip Unit Only	Mounting Assembly	Lugs (6 required)
	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1200	PD63B120■	PD63F160	PD63T120■	MB9301	TA5P600
1400	PD63B140		PD63T140	-or-	
1600	PD63B160		PD63T160	MBR9302	

Type HPXD6^② Non-Interchangeable Trip^⑤

3-Pole 600V AC, 250-500V DC^①

Blue Label

Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only)
	Catalog Number
1200	HPXD63B120■
1400	HPXD63B140■
1600	HPXD63B160

Type HPD6 Interchangeable Trip^⑤

3-Pole 600V AC, 250-500V DC^①

Black Label

Continuous Current Rating @ 40°C	Complete Breaker Unassembled	Frame Only	Trip Unit Only	Mounting Assembly	Lugs (6 required)
	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1200	HPD63B120■	HPD63F160	PD63T120■	MB9301	TA5P600
1400	HPD63B140		PD63T140	-or-	
1600	HPD63B160		PD63T160	MBR9302	

Type CPD6 Non-Interchangeable Trip^⑤

Fuseless Current Limiting

3-Pole 600V AC, 250-500V DC^①

Red Label

Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only)
	Catalog Number
1200	CPD63B120■
1400	CPD63B140■
1600	CPD63B160■

Interrupting Ratings

Breaker Type	UL 489 A IR				
	RMS Symmetrical KA				
	Volts AC			Volts DC ^①	
	240	480	600	250	500
PD6, PXD6	65	50	25	30 (2P)	25 (3P)
HPD6, HPXD6	100	65	50	30 (2P)	50 (3P)
CPD6	200	100	65	30 (2P)	50 (3P)

■ Built to order. Allow 2-3 weeks for delivery.

▲ Built to order. Allow 6-8 weeks for delivery.

① Use two outside poles of a 3-pole circuit breaker for 250V

② When wired as shown on page 17/5, this circuit breaker is

UL listed and rated for use on 500V DC ungrounded UPS systems only.

③ PXD6, HPXD6 and CPD6 type circuit breakers are UL Listed for reverse feed applications.

④ For additional information See **Note: A**, page 17/101.

Ordering Instructions

Complete Breaker Unassembled with Lugs

Prices of PD6, HPD6, RD6, and HRD6 type breakers include frame, trip, mounting base (MB9301), and both line and load lugs (PD Frame – TA5P600, RD Frame – TC5R600). When ordered by these catalog numbers, the customer will receive the frame, trip, mounting assembly and lugs separately packaged. For applications requiring different mounting base or lugs, order individual items as needed.

Complete Breaker Assembled without Lugs

Prices of PXD6, HPXD6, RXD6, HRXD6 and CPD6 type breakers include frame with non-interchangeable trip unit installed only. Order required mounting base and lugs separately.

100% Rated (3-Pole only)

Types PXD6, HPXD6 breakers are available with 100% ratings. To order add suffix "H" to catalog number, and 10% to list price. 100% PD breakers require 90° C cable sized at 75° C ampacity and TC5R600 lugs. RD 2000A Frames not available with 100% ratings.

50°C Applications see page 17/104.

400HZ Applications see page 17/104.

Lugs (6 required per breaker)^④

Catalog Number	No of Cables per Connector	Wire Range
TA5P600	1-5	300-600 kcmil Cu/Al
TC5R600	1-5	300-600 kcmil Cu only
TA4P750▲	1-4	500-750 kcmil Cu/Al
TA6R600	1-6	300-600 kcmil Cu/Al

⑤ HACR rated.

Note: PD frame qualified to UL489 supplement B "NAVAL". See page 17/104 for additional information.

Sentron Molded Case Circuit Breakers

SPD 1600A Frame Digital Solid State Sentron Sensitrip III Series

Selection/Dimensions

Ordering Information

Pricing information for all Digital Sentron Series PD frame unit is for breaker only. Price required mounting block assembly and necessary terminal connectors as separate items.

SPD6 and SHPD6 are acceptable for reverse connection applications.

Type SPD6

Blue Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SPD69140■	1400
SPD69160■	1600
SPD69140G■	1400
SPD69160G■	1600
SPD69140NT■	1400
SPD69160NT■	1600
SPD69140NGT■	1400
SPD69160NGT■	1600

Type SHPD6

Black Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SHPD69140■	1400
SHPD69160■	1600
SHPD69140G■	1400
SHPD69160G■	1600
SHPD69140NT■	1400
SHPD69160NT■	1600
SHPD69140NGT■	1400
SHPD69160NGT■	1600



Lugs^①

Catalog Number	No. of Cables per Connector	Wire Range
TA5P600	1-5 pcs.	300-600 kcmil Cu/Al
TC5R600	1-5 pcs.	300-600 kcmil Cu Only
TA6R600	1-6 pcs.	300-600 kcmil Cu/Al

Neutral Transformers

Ampere Rating	Catalog Number
1400	N14SPD
1600	N16SPD

Enclosure

Type	Catalog Number
1	PRD6N1

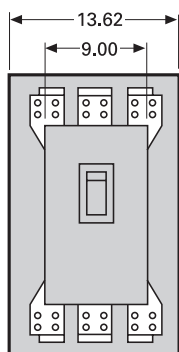
Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489		
	240V AC	480V AC	600V AC
SPD6	65	50	25
SHPD6	100	65	50

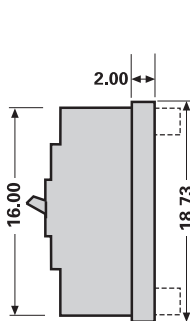
Mounting Block (Required)^②

Catalog Number
MB9301
MBR9302

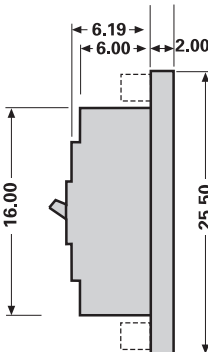
All PD, RD Frames:



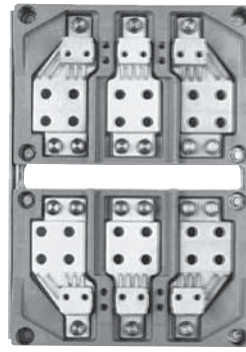
MB9301 (shown)
MBR9302



MBR9302



MB9301



MBR9302



MB9301

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2-3 weeks for delivery.

①For additional information, see Note: A, page 17/101.

②The PD frame circuit breaker requires the use of a connect-all mounting assembly to allow for placing into service.

Note: "G" suffix in catalog number denotes circuit breaker for 3-phase, 3-wire circuits.

For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

Sentron Molded Case Circuit Breakers

RD 2000A Frame Sentron Series

Selection

Type RXD6^④

3-Pole 600V AC, 250-500V DC^①

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker Only Without Lugs)			
Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only) Catalog Number	Mounting Assembly Catalog Number	Lugs (6 required) Catalog Number
1600	RXD63B160	MB9301	TC5R600
1800	RXD63B180	-or-	
2000	RXD63B200	MBR9302	

Type RD6^④

3-Pole 600V AC, 250-500V DC^①

Blue Label

Interchangeable Trip (Unassembled Circuit Breaker with Lugs)					
Continuous Current Rating @ 40°C	Complete Breaker Unassembled Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number	Mounting Assembly Catalog Number	Lugs (6 required) Catalog Number
1600	RD63B160■	RD63F200	RD63T160■	MB9301	TC5R600
1800	RD63B180		RD63T180	-or-	
2000	RD63B200		RD63T200	MBR9302	

Type HRXD6^④

Black Label

Continuous Current Rating @ 40°C	Complete Breaker Assembled (Frame/Trip Unit Only) Catalog Number
1600	HRXD63B160■
1800	HRXD63B180■
2000	HRXD63B200

Type HRD6^④

Black Label

Continuous Current Rating @ 40°C	Complete Breaker Unassembled Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number	Mounting Assembly Catalog Number	Lugs (6 required) Catalog Number
1600	HRD63B160■	HRD63F200	RD63T160■	MB9301	TC5R600
1800	HRD63B180		RD63T180	-or-	
2000	HRD63B200		RD63T200	MBR9302	

Interrupting Ratings

Breaker Type	UL 489 A IR				
	RMS Symmetrical KA				
	Volts AC			Volts DC ^①	
	240	480	600	250	500
RD6, RXD6	65	50	25	30 (2P)	25 (3P)
HRD6, HRXD6	100	65	50	30 (2P)	50 (3P)

Instantaneous Adjustment Trip Range (PD / RD Frames)

Breaker Ampere Rating	Nominal Instantaneous Values						
	±20% Tolerance Low	2	3	4	5	6	7
	5000	5715	6430	7145	7860	8575	9790
1200-2000	5000	5715	6430	7145	7860	8575	9790



Mounting Block^⑥

Catalog Number	Connection Points
MB9301	Front
MBR9302	Rear

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
PXD6, HPXD6, RXD6, HRXD6, CPD6 Assembled Breakers		
3	1	61.5
PD6, HPD6, RD6, HRD6 Frame Only		
3	1	55.0
PD6, RD6 Trip Unit Only		
3	1	6.5
Mounting Assembly		
MB9301	1	53.0
MBR9302	1	50.9

Lugs (6 required per breaker)^⑤

Catalog Number	No of Cables per Connector	Wire Range
TC5R600	1-5	300-600 kcmil Cu only
TA6R600	1-6	300-600 kcmil Cu/Al

■ Built to order. Allow 2-3 weeks for delivery.

▲ Built to order. Allow 6-8 weeks for delivery.

① Use two outside poles of a 3-pole circuit breaker for 250V DC applications.

② When wired as shown on page 17/5, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

③ RXD6 and HRXD6 type circuit breakers are UL Listed for reverse feed applications.

④ HACR rated.

⑤ For additional information See **Note: A**, page 17/101
Note: RD frame qualified to UL489 supplement B "NAVAL". See page 17/104 for additional information.

⑥ For required mounting base (MB9301 or MBR9302) see page 17/88.

Sentron Molded Case Circuit Breakers

Internal Accessories

Selection/Dimensions

Accessories for:

MD/SMD 800A Frame
ND/SND 1200A Frame
PD/SPD 1600A Frame
RD 2000A Frame



Accessory modules can mount in either left hand or right hand poles of all circuit breakers, including solid state. Exception: when mechanical interlock is used. Accessories cannot be mounted in left pole.

Sensitrip Ammeter



The Ammeter Display Units plug into the Sensitrip Trip Unit and displays the phase current flowing in the breaker. They are powered by the breaker's CT's with replaceable battery back-up for maintaining trip and max logs.

The SADU reads currents, current imbalance, current demand, and trip status.

Ammeter Mounting Kit

The Ammeter may also be panel or door mounted using the SADURMK18 remote mounting kit.

Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
120		S01MN6	S01MN64A
208		S02MN6▲	—
240		S03MN6	S03MN64A▲
277		S15MN6▲	S15MN64A▲
480		S04MN6▲	S04MN64A▲
600		S06MN6▲	—
	12	S16MN6▲	S16MN64A▲
	24	S07MN6	S07MN64A
	48	S09MN6▲	—
	125	S11MN6	S11MN64A▲
	250	S13MN6▲	S13MN64A▲

Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01MN6	U01MN64A	U01MN64AA
208		U02MN6▲	U02MN64A▲	U02MN64AA▲
240		U03MN6▲	U03MN64A▲	U03MN64AA▲
277		U15MN6▲	U15MN64A▲	U15MN64AA▲
480		U04MN6▲	U04MN64A▲	U04MN64AA▲
600		U06MN6▲	—	—
	24	U07MN6	U07MN64A	U07MN64AA
	48	U09MN6▲	U09MN64A▲	U09MN64AA▲
	125	U11MN6▲	U11MN64A▲	U11MN64AA▲
	250	U13MN6▲	U13MN64A▲	U13MN64AA▲

Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01MN64	A02MN64
—	12	A01MNDLV▲	A02MNDLV▲

Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
480	250	B00MN64	A01MN64B	A02MN64B

Plug-in Ammeter Display Units

Breaker Type	Description	Catalog Number
SMD, SND, SPD	Display Unit	SADU
	Remote Mounting Kit	SADURMK18

▲ Built to order. Allow 6–8 weeks for delivery.

Sentron Molded Case Circuit Breakers

Magnetic Trip Only — ETI Motor Circuit Protector

Selection

Breaker Type	Ampere Rating	Instantaneous Trip Range ^②		Complete Circuit Breaker Without Lugs ^③	
		Minimum ^③	Maximum ^③	Catalog Number 2-Pole	Catalog Number 3-Pole
HEM	3	9	33	—	HEM3M003L
	7	21	77	—	HEM3M007L
	15	45	165	—	HEM3M015L
	30	90	330	—	HEM3M030L
	50	150	550	—	HEM3M050L
	70	210	770	—	HEM3M070L
	100	300	1100	—	HEM3M100L
SHIPPING:					3.7 lbs. each
ED6-A 600V AC 250V DC	1	2.6	9	—	ED63A001
	2	7	22	—	ED63A002
	3	10	35	—	ED63A003
	5	16	54	—	ED63A005
	10	30	100	—	ED63A010
	25	55	180	—	ED63A025
	30	80	270	—	ED63A030
	40	115	375	—	ED63A040
	50	180	600	—	ED63A050
	100	315	1000	—	ED63A100
	125	500	1250	—	ED63A125
SHIPPING:					3.8 lbs. each
CED6-A 600V AC 250V DC	1	2.6	9	—	CED63A001■
	2	7	22	—	CED63A002■
	3	10	35	—	CED63A003■
	5	16	54	—	CED63A005■
	10	30	100	—	CED63A010■
	25	55	180	—	CED63A025■
	30	80	270	—	CED63A030■
	40	115	375	—	CED63A040■
	50	180	600	—	CED63A050■
	100	315	1000	—	CED63A100■
	125	500	1250	—	CED63A125■
SHIPPING:					6 lbs. each
FXD6 ^④ 600V AC 250V DC	150	400	800	—	FXD63L150■
	150	800	1500	—	FXD63A150
	150	1100	2500	—	FXD63H150
	250	1100	2500	—	FXD63A250
SHIPPING:					9 lbs. each
CFD6 ^④ 600V AC 250V DC	150	400	800	—	CFD63L150■
	150	800	1500	—	CFD63A150■
	150	1100	2500	—	CFD63H150■
	250	1100	2500	—	CFD63A250■
SHIPPING:					12 lbs. each
JXD6(A) ^① 600V AC 250V DC	400	1250	2500	—	JXD63L400
	400	2000	4000	JXD62H400■	JXD63H400
SHIPPING:					16 lbs. each
CJD6 ^① 600V AC 250V DC	400	1250	2500	—	CJD63L400■
	400	2000	4000	—	CJD63H400■
SHIPPING:					29.5 lbs. each
LXD6(A) ^① 600V AC 250V DC	600	2000	4000	LXD62L600■	LXD63L600■
	600	3000	6000	—	LXD63H600
SHIPPING:					16 lbs. each
CLD6 ^① 600V AC 250V DC	600	2000	4000	—	CLD63L600■
	600	3000	6000	—	CLD63H600■
SHIPPING:					31.5 lbs. each
LMXD6 ^④ 600V AC 250V DC	800	2800	6000	—	LMXD63L800■
	800	3200	8000	—	LMXD63A800
SHIPPING:					35 lbs. each
MXD6 ^④ 600V AC 250V DC	800	3000	6000	—	MXD63L800■
	800	4000	8000	—	MXD63A800■
	800	5000	10000	—	MXD63H800
SHIPPING:					33 lbs. each
CMD6 ^④ 600V AC 250V DC	800	3000	6000	—	CMD63L800■
	800	4000	8000	—	CMD63A800■
	800	5000	10000	—	CMD63H800■
SHIPPING:					80 lbs. each

Important Information

ETI interrupting ratings are determined through combination tests with properly sized overload relays and contactors.

⑤ Connectors included when ordering by circuit breaker catalog number for HEM, ED and CED6 ETIs. Order ETI circuit breaker and lugs (2 per pole) separately for the FXD6, CFD6, MXD6, CMD6, JXD6, CJD6, LXD6 and CLD6 ETI's.

■ Built to order. Allow 2-3 weeks for delivery.

① 2-pole available in 3-pole width only.

② When applied on DC Circuits — Trip levels will increase approximately +15 to 20%.

③ Tolerance -20%/+30% for lowest setting. All other set-

tings are -20%/+20%

④ For 2-pole application use outside poles of 3-pole circuit breaker.

Lug Information pages 17/101 to 17/103
Accessories pages 17/108 to 17/113
Application data pages 17/92 to 17/93

Sentron Molded Case Circuit Breakers

Motor Circuits

Application

General

Protection of Motor Circuits

Molded case circuit breakers are used in motor circuits as a disconnecting means and for short-circuit protection. They should be used in conjunction with motor-running, over-current-protection devices, and should permit the motor to start without nuisance tripping from motor-inrush current. The circuit breaker should have a continuous-current rating of not less than 115% of the motor full-load current.

The recommended motor circuit protectors (Siemens ETI instantaneous only circuit breakers) listed have

continuous-current ratings of at least 115% of motor full-load currents. The trip-setting positions are approximately 11 times motor full-load currents. The suggested trip settings may have to be adjusted upward to no higher than 1300% of full-load current for non-design E type motors, and no greater than 1700% of full load current for design E motors, to allow for motor start-up due to inrush currents.

Breaker Mounted Immediately Ahead of Motor Starter

Siemens ETI motor circuit protectors are recommended for use in combination motor starters to provide selective short-circuit protection for the motor

branch circuit. The adjustable instantaneous-trip feature of the Siemens ETI motor circuit protector provides for a trip setting slightly above the peak motor-inrush current. With this setting, no delay is introduced in opening the circuit when a fault occurs. This circuit breaker has no time-delay trip element. Therefore it must be used in conjunction with, and immediately ahead of, the motor-running overcurrent protective device.

Important: The information below does not apply to all motor applications: it is recommended that the user refer to the National Electrical Code (NEC) for specific needs.

Table 1 (When Breaker is Mounted Immediately Ahead of Motor Starter)

3-Phase Induction Type Motors (Siemens ETI motor circuit protectors for branch circuit use with alternating-current combination, full voltage motor starters).

Motor Full Load Amperes	Catalog Number	ETI Trip Setting	
		Adjustment	Amperes
0.69 – 0.91	HEM3M003L	A (min)	9
1.1 – 1.3		B	15
1.6 – 1.7		C	21
2.0 – 2.2		D	27
2.3 – 2.5		E	30
2.6 – 2.8		F (max)	33
1.5 – 2.0	HEM3M007L	A (min)	21
2.6 – 3.1		B	35
3.7 – 3.9		C	49
4.8 – 5.2		D	63
5.3 – 5.7		E	70
5.8 – 6.1		F (max)	77
3.4 – 4.5	HEM3M015L	A (min)	45
5.7 – 6.8		B	75
8.0 – 9.1		C	100
10.4 – 11.4		D	135
11.5 – 12.6		E	150
12.7 – 13.0		F (max)	165
3.9 – 9.1	HEM3M030L	A (min)	90
11.5 – 13.7		B	150
16.1 – 18.3		C	210
20.7 – 22.9		D	270
23.0 – 25.2		E	300
25.3 – 26.1		F (max)	330
11.5 – 15.2	HEM3M050L	A (min)	150
19.2 – 22.9		B	250
26.9 – 30.6		C	350
34.6 – 38.3		D	450
38.4 – 42.1		E	500
42.2 – 43.5		F (max)	550
16.1 – 30.6	HEM3M070L	A (min)	210
26.9 – 32.2		B	350
37.6 – 42.9		C	490
48.4 – 53.7		D	630
53.8 – 59.1		E	700
59.2 – 60.9		F (max)	770
23.0 – 30.9	HEM3M100L	A (min)	300
38.4 – 46.0		B	500
53.8 – 61.4		C	700
69.2 – 76.8		D	900
76.9 – 84.5		E	1000
84.6 – 87.0		F (max)	1100
.20 – .33	ED63A001 CED63A001	Low	2.6
.34 – .45		2	4.5
.46 – .56		3	6
.57 – .68		4	7.5
.69 – .81		High	9
.53 – .83	ED63A002 CED63A002	Low	7
.84 – 1.14		2	11
1.15 – 1.45		3	15
1.46 – 1.68		4	19
1.69 – 2.00		High	22
.76 – 1.29	ED63A003 CED63A003	Low	10
1.30 – 1.75		2	17
1.76 – 2.29		3	23
2.30 – 2.68		4	30
2.69 – 3.18		High	35

Motor Full Load Amperes	Catalog Number	ETI Trip Setting	
		Adjustment	Amperes
1.23 – 1.99	ED63A005 CED63A005	Low	16
2.00 – 2.75		2	26
2.76 – 3.52		3	36
3.53 – 4.14		4	46
4.15 – 4.90		High	54
2.30 – 3.83	ED63A010 CED63A010	Low	30
3.84 – 5.37		2	50
5.38 – 6.52		3	70
6.53 – 7.68		4	85
7.69 – 9.10		High	100
4.23 – 6.91	ED63A025 CED63A025	Low	55
6.92 – 9.61		2	90
9.62 – 11.91		3	125
11.92 – 13.83		4	155
13.84 – 16.40		High	180
6.15 – 10.37	ED63A030 CED63A030	Low	80
10.38 – 14.22		2	135
14.23 – 18.06		3	185
18.07 – 20.75		4	235
20.76 – 24.50		High	270
8.84 – 14.22	ED63A040 CED63A040	Low	115
14.23 – 19.60		2	185
19.61 – 24.99		3	255
25.00 – 28.83		4	325
28.84 – 34.00		High	375
13.84 – 23.06	ED63A050 CED63A050	Low	180
23.07 – 31.52		2	300
31.53 – 39.99		3	410
40.00 – 46.14		4	520
46.15 – 54.50		High	600
24.23 – 41.52	ED63A100 CED63A100	Low	315
41.53 – 56.91		2	540
56.92 – 68.45		3	740
68.46 – 76.91		4	890
76.92 – 90.90		High	1000
38.46 – 55.37	ED63A125 CED63A125	Low	500
55.38 – 70.75		2	720
70.76 – 84.60		3	920
84.61 – 96.14		4	1100
96.15 – 113.60		High	1250
30.76 – 35.37	FXD63L150 CFD63L150	Low	400
35.38 – 39.99		2	460
44.51 – 49.23		4	580
53.84 – 58.45		6	700
58.46 – 63.06		7	760
63.07 – 74.50		High	820
61.53 – 69.22	FXD63A150 CFD63A150	Low	800
69.23 – 76.91		2	900
84.61 – 92.29		4	1100
100.00 – 108.00		6	1300
108.00 – 115.00		7	1400
115.00 – 136.00		High	1500
85.00 – 100.00	FXD63A250 CFD63A250	Low	1100
100.00 – 115.00		2	1300
131.00 – 146.00		4	1700
162.00 – 177.00		6	2100
177.00 – 192.00		7	2300
192.00 – 227.00		High	2500

Motor Full Load Amperes	Catalog Number	ETI Trip Setting	
		Adjustment	Amperes
95.00 – 110.00	JXD63L400 CJD63L400	Low	1250
110.00 – 124.00		2	1430
138.00 – 151.00		4	1790
165.00 – 178.00		6	2140
178.00 – 192.00		7	2320
192.00 – 227.00		High	2500
154.00 – 176.00	JXD63H400 CJD63H400	Low	2000
176.00 – 198.00		2	2290
220.00 – 242.00		4	2860
264.00 – 285.00		6	3430
285.00 – 308.00		7	3710
308.00 – 326.00		High	4000
155.00 – 176.00	LXD63L600 CLD63L600	Low	2000
176.00 – 198.00		2	2290
220.00 – 242.00		4	2860
264.00 – 285.00		6	3430
285.00 – 308.00		7	3710
308.00 – 326.00		High	4000
231.00 – 264.00	LXD63H600 CLD63H600	Low	3000
264.00 – 292.00		2	3430
330.00 – 362.00		4	4290
395.00 – 428.00		6	5140
428.99 – 462.00		7	5570
462.00 – 490.00		High	6000
215.00 – 238.00	LMD63L800	Low	2800
238.00 – 261.00		2	3100
261.00 – 284.00		3	3400
308.00 – 369.00		5	4000
369.00 – 423.00		6	4800
423.00 – 462.00		7	5500
462.00 – 490.00		High	6000
246.00 – 269.00	LMD63A800	Low	3200
269.00 – 284.00		2	3500
284.00 – 323.00		3	3700
362.00 – 492.00		5	4700
492.00 – 562.00		6	6400
562.00 – 616.00		7	7300
616.00 – 660.00		High	8000
231.00 – 264.00	MXD63L800 CMD63L800	Low	3000
264.00 – 292.00		2	3430
292.00 – 330.00		3	3800
362.00 – 395.00		5	4710
428.00 – 462.00		7	5570
462.00 – 490.00		High	6000
308.00 – 352.00	MXD63A800 CMD63A800	Low	4000
352.00 – 442.00		2	4570
442.00 – 447.00		3	5740
483.00 – 527.00		5	6280
571.00 – 616.00		7	7240
616.00 – 660.00		High	8000
385.00 – 440.00	MXD63H800 CMD63H800	Low	5000
495.00 – 550.00		3	6430
605.00 – 660.00		5	7860
660.00 – 695.00		6	8575

Note: Lowest instantaneous settings have a -20%/+30% tolerance and all other settings have a -20%/+20% tolerance.

Sentron Molded Case Circuit Breakers

Motor Circuits

Application

Breaker Mounted at a Distance From Motor Starter

ET thermal-magnetic circuit breakers conform to the National Electrical Code table 430-152 requirements for motor branch and feeder circuit protection when properly applied in conjunction with motor-running overcurrent protective devices. The recommended

circuit-breaker ratings in Table 2 provide adequate time delay for starting the majority of three phase induction motors.

To determine the ampere ratings of the ET breaker to protect a motor feeder, add the rating of the ET breaker used to protect the largest motor branch circuit in the group to the full-load currents of the remaining motors in the group.

Interrupt Ratings

For normal commercial purposes, available fault current can conveniently be obtained in the Interrupting Selector Tables.

Table 2 (When Breaker is Mounted at a Distance From Motor Starter)

3-Phase Induction Type Motors (EQ and ET circuit breakers (thermal-magnetic trip) for branch breaker use with alternating-current combination motor starters).

Motor Horse-power Rating	200 and 208V Motors			230V Motors			460V Motors			575V Motors		
	240V Circuit Breaker Data ^①			240V Circuit Breaker Data ^①			480V Circuit Breaker Data ^①			600V Circuit Breaker Data ^①		
	Breaker Type	Catalog Number	Ampere Rating	Breaker Type	Catalog Number	Ampere Rating	Breaker Type	Catalog Number	Ampere Rating	Breaker Type	Catalog Number	Ampere Rating
½	BQ [®]	BQ3B015	15	BQ [®]	BQ3B015	15	ED4	ED43B015	15	ED6	ED63B015	15
¾		BQ3B015	15		BQ3B015	15		ED43B015	15		ED63B015	15
1		BQ3B015	15		BQ3B015	15		ED43B015	15		ED63B015	15
1½		BQ3B015	15		BQ3B015	15		ED43B015	15		ED63B015	15
2		BQ3B020	20		BQ3B015	15		ED43B015	15		ED63B015	15
3		BQ3B030	30		BQ3B020	20		ED43B015	15		ED63B015	15
5	BQ [®]	BQ3B040	40	BQ [®]	BQ3B030	30	ED4	ED43B015	15	ED6	ED63B015	15
7½		BQ3B060	60		BQ3B050	50		ED43B030	30		ED63B020	20
10		BQ3B070	70		BQ3B070	70		ED43B030	30		ED63B030	30
15		BQ3B100	100		BQ3B090	90		ED43B040	40		ED63B035	35
20					BQ3B100	100		ED43B050	50		ED63B050	50
25	FXD6	FXD63B125	125	FXD6	FXD63B125	125	FXD6	FXD63B090	90	FXD6	FXD63B060	60
30		FXD63B150	150		FXD63B150	150		FXD63B100	100		FXD63B070	70
40		FXD63B175	175		FXD63B175	175		FXD63B125	125		FXD63B090	90
50		FXD63B200	200		FXD63B200	200		FXD63B150	150		FXD63B100	100
		FXD63B225	225									
60	JXD2	JXD23B300	300	—	—	—	FXD6, FD6	FXD63B150	150	FXD6	FXD63B100	100
75	JXD2	JXD23B400	400	JXD2	JXD23B350	350	FXD6, FD6	FXD63B200	200	FXD6, FD6	FXD63B125	125
100	JXD2	JXD23B400	400	JXD2	JXD23B400	400	FD6 [®] JD6 [®]	FD63B250 JD63B250	250 250	FXD6, FD6	FD63B175	175
125	LD6 [®] or LMD6	LD63B600 LMD63B600	600	LD6 [®] or LMD6	LD63B500 or LMD63B500	500	JD6 [®]	JD63B300	300	FXD6, FD6 OR JD6 [®]	FXD63B200 JD63B200	200 200
150	LD6 [®] or LMD6	LD63B600 or LMD63B600	600	LMD6	LD63B600 or LMD63B600	600	JD6 [®]	JD63B300	300	FXD6 or JD6 [®]	FXD63B225 JD63B225	225 225
200	LMD6	LMD63B800	800	LMD6	LMD63B800	800	JD6 [®] JD6 [®] LD6 [®] or LMD6	JD63B350 JD63B400 LD63B600 or LMD63B600	350 400 600	JD6 [®] JD6 [®] JD6 [®]	JD63B300 JD63B400 JD63B400	300 400 400
250	—	—	—	—	—	—	—	—	—	—	—	—
300	—	—	—	—	—	—	—	—	—	—	—	—
350	—	—	—	—	—	—	LMD6	LMD63B700	700	LD6 [®] or LMD6	LD63B500 or LMD63B500	500
400	—	—	—	—	—	—	LMD6	LMD63B800	800	LD6 [®] or LMD6	LD63B600 or LMD63B600	600
500	—	—	—	—	—	—	—	—	—	LMD6	LMD63B800	800

①The selection of breakers for this table is in accordance with Article 430, 2005 National Electric Code. Recommended circuit breakers are for full voltage starting, special consideration is necessary for reduced voltage starting.

②For panelboard applications, substitute the BL breaker for the BQ, ED2 circuit breakers may also be used.

③For non-interchangeable trip applications, substitute the FXD6 for the FD6, the JXD6 for the JD6, or the LXD6 for the LD6.

Sentron Molded Case Circuit Breakers

Adjustable Installments Magnetic Trip Settings

Application

Breaker Type	Maximum Continuous Amperes	Nominal AC Adjustable Trip Range								ETI Motor Circuit Protector Catalog Number	Thermal Magnetic Catalog Number	
		Low	2	3	4	5	6	7	High		2-Pole	3-Pole
HEM	3	9	15	21	27	30	—	—	33	HEM3M003L	—	—
	7	21	35	49	63	70	—	—	77	HEM3M007L	—	—
	15	45	75	100	135	150	—	—	165	HEM3M015L	—	—
	30	90	150	210	270	300	—	—	330	HEM3M030L	—	—
	50	150	250	350	450	500	—	—	550	HEM3M050L	—	—
	70	210	350	490	630	700	—	—	770	HEM3M070L	—	—
ED6	100	300	500	700	900	1000	—	—	1100	HEM3M100L	—	—
	1	2.6	4.5	6	7.5	—	—	—	9	ED63A001	—	—
	2	7	11	15	19	—	—	—	22	ED63A002	—	—
	3	10	17	23	30	—	—	—	35	ED63A003	—	—
	5	16	26	36	46	—	—	—	54	ED63A005	—	—
	10	30	50	70	85	—	—	—	100	ED63A010	—	—
CED6	25	55	90	125	155	—	—	—	180	ED63A025	—	—
	30	80	135	185	235	—	—	—	270	ED63A030	—	—
	40	115	185	255	325	—	—	—	375	ED63A040	—	—
	50	180	300	410	520	—	—	—	600	ED63A050	—	—
	100	315	540	740	890	—	—	—	1000	ED63A100	—	—
	125	500	720	920	1100	—	—	—	1250	ED63A125	—	—
FXD6-A	1	2.6	4.5	6	7.5	—	—	—	9	CED63A001■	—	—
	2	7	11	15	19	—	—	—	22	CED63A002■	—	—
	3	10	17	23	30	—	—	—	35	CED63A003■	—	—
	5	16	26	36	46	—	—	—	54	CED63A005■	—	—
	10	30	50	70	85	—	—	—	100	CED63A010■	—	—
	25	55	90	125	155	—	—	—	180	CED63A025■	—	—
FD6-A	30	80	135	185	235	—	—	—	270	CED63A030■	—	—
	40	115	185	255	325	—	—	—	375	CED63A040■	—	—
	50	180	300	410	520	—	—	—	600	CED63A050	—	—
	100	315	540	740	890	—	—	—	1000	CED63A100	—	—
	125	500	720	920	1100	—	—	—	1250	CED63A125	—	—
	70	600	640	690	730	770	810	850	900	—	FXD62B070	FXD63B070
HFD6	80	600	640	690	730	770	810	850	900	—	FXD62B080	FXD63B080
	90	600	640	690	730	770	810	850	900	—	FXD62B090	FXD63B090
	100	700	770	840	920	990	1060	1140	1200	—	FXD62B100	FXD63B100
	110	700	770	840	920	990	1060	1140	1200	—	FXD62B110	FXD63B110
	125	800	900	1000	1100	1200	1300	1400	1500	—	FXD62B125	FXD63B125
	150	800	900	1000	1100	1200	1300	1400	1500	—	FXD62B150	FXD63B150
HHFD6	175	900	1060	1210	1370	1520	1780	1930	2000	—	FXD62B175	FXD63B175
	200	900	1060	1210	1370	1520	1780	1930	2000	—	FXD62B200	FXD63B200
	225	1100	1300	1500	1700	1900	2100	2300	2500	—	FXD62B225	FXD63B225
	250	1100	1300	1500	1700	1900	2100	2300	2500	—	FXD62B250	FXD63B250
	70	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
	80	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
CFD6	90	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
	100	700	770	840	920	990	1060	1140	1200	—	FXD63A250	FXD63B250
	110	700	770	840	920	990	1060	1140	1200	—	FXD63A250	FXD63B250
	125	800	900	1000	1100	1200	1300	1400	1500	—	FXD63A250	FXD63B250
	150	800	900	1000	1100	1200	1300	1400	1500	—	FXD63A250	FXD63B250
	175	900	1060	1210	1370	1520	1780	1930	2000	—	FXD63A250	FXD63B250
CFD6	200	900	1060	1210	1370	1520	1780	1930	2000	—	FXD63A250	FXD63B250
	225	1100	1300	1500	1700	1900	2100	2300	2500	—	FXD63A250	FXD63B250
	250	1100	1300	1500	1700	1900	2100	2300	2500	—	FXD63A250	FXD63B250
	70	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
	80	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
	90	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
CFD6	100	700	770	840	920	990	1060	1140	1200	—	FXD63A250	FXD63B250
	110	700	770	840	920	990	1060	1140	1200	—	FXD63A250	FXD63B250
	125	800	900	1000	1100	1200	1300	1400	1500	—	FXD63A250	FXD63B250
	150	800	900	1000	1100	1200	1300	1400	1500	—	FXD63A250	FXD63B250
	175	900	1060	1210	1370	1520	1780	1930	2000	—	FXD63A250	FXD63B250
	200	900	1060	1210	1370	1520	1780	1930	2000	—	FXD63A250	FXD63B250
CFD6	225	1100	1300	1500	1700	1900	2100	2300	2500	—	FXD63A250	FXD63B250
	250	1100	1300	1500	1700	1900	2100	2300	2500	—	FXD63A250	FXD63B250
	70	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
	80	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
	90	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
	100	700	770	840	920	990	1060	1140	1200	—	FXD63A250	FXD63B250
CFD6	110	700	770	840	920	990	1060	1140	1200	—	FXD63A250	FXD63B250
	125	800	900	1000	1100	1200	1300	1400	1500	—	FXD63A250	FXD63B250
	150	800	900	1000	1100	1200	1300	1400	1500	—	FXD63A250	FXD63B250
	175	900	1060	1210	1370	1520	1780	1930	2000	—	FXD63A250	FXD63B250
	200	900	1060	1210	1370	1520	1780	1930	2000	—	FXD63A250	FXD63B250
	225	1100	1300	1500	1700	1900	2100	2300	2500	—	FXD63A250	FXD63B250
CFD6	250	1100	1300	1500	1700	1900	2100	2300	2500	—	FXD63A250	FXD63B250
	70	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
	80	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
	90	600	640	690	730	770	810	850	900	—	FXD63A250	FXD63B250
	100	700	770	840	920	990	1060	1140	1200	—	FXD63A250	FXD63B250
	110	700	770	840	920	990	1060	1140	1200	—	FXD63A250	FXD63B250
CFD6	125	800	900	1000	1100	1200	1300	1400	1500	—	FXD63A250	FXD63B250
	150	800	900	1000	1100	1200	1300	1400	1500	—	FXD63A250	FXD63B250
	175	900	1060	1210	1370	1520	1780	1930	2000	—	FXD63A250	FXD63B250
	200	900	1060	1210	1370	1520	1780	1930	2000	—	FXD63A250	FXD63B250
	225	1100	1300	1500	1700	1900	2100	2300	2500	—	FXD63A250	FXD63B250
	250	1100	1300	1500	1700	1900	2100	2300	2500	—	FXD63A250	FXD63B250

Note: Tolerances for instantaneous trip points meet UL 489 (7.3). Nominal AC instantaneous trip points are given in the tables. For DC instantaneous trip points, add 15% to nominal values.

Instantaneous trip adjustment is made through the breaker cover on all frame breakers. To change instantaneous trip point on circuit breaker, depress indicating knob, then rotate to desired position.

■ Built to order. Allow 2-3 weeks for delivery.

Sentron Molded Case Circuit Breakers

Adjustable Instantaneous Magnetic Trip Settings

Application

Breaker Type	Maximum Continuous Amperes	Nominal AC Adjustable Trip Range								ETI Motor Circuit Protector Catalog Number	Thermal Magnetic Catalog Number		
		Low	2	3	4	5	6	7	High		3-Pole	2-Pole	3-Pole
JXD2(A)	200	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JXD22B200	JXD23B200
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JXD22B225	JXD23B225
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JXD22B250	JXD23B250
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JXD22B300	JXD23B300
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	JXD22B350	JXD23B350
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	—	JXD22B400	JXD23B400
JXD6(A)	200	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JXD62B200	JXD63B200
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JXD62B225	JXD63B225
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JXD62B250	JXD63B250
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JXD62B300	JXD63B300
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	JXD62B350	JXD63B350
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	—	JXD62B400	JXD63B400
JD6(A)	200	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JD62B200	JD63B200
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JD62B225	JD63B225
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JD62B250	JD63B250
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	JD62B300	JD63B300
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	JD62B350	JD63B350
	400	2000	2290	2570	2860	3140	3430	3710	4000	JXD63L400 JXD63H400	—	—	—
HJD6(A)	200	1250	1430	1610	1790	1960	2140	2320	2500	—	—	HJD62B200	HJD63B200
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	—	HJD62B225	HJD63B225
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	HJD62B250	HJD63H250
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	HJD62B300	HJD63B300
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	HJD62B350	HJD63B350
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	—	HJD62H400	HJD63B400
HHJD6	200	1250	1430	1610	1790	1960	2140	2320	2500	—	—	HHJD62B200	HHJD63B200
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	—	HHJD62B225	HHJD63B225
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	HHJD62B250	HHJD63B250
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	HHJD62B300	HHJD63B300
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	HHJD62B350	HHJD63B350
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	—	HHJD62B400	HHJD63B400
CJD6	200	1250	1430	1610	1790	1960	2140	2320	2500	—	—	—	CJD63B200
	225	1250	1430	1610	1790	1960	2140	2320	2500	—	—	—	CJD63B225
	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	—	CJD63B250
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	—	CJD63B300
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	—	CJD63B350
	400	2000	2290	2570	2860	3140	3430	3710	4000	CJD63H400 CJD63L400	—	—	CJD63B400
LXD6(A)	450	2000	2290	2570	2860	3140	3430	3710	4000	—	—	LXD62B450	LXD63B450
	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	LXD62B500	LXD63B500
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	—	LXD62B600	LXD63B600
LD6(A)	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	LD62B250	LD63B250
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	LD62B300	LD63B300
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	LD62B350	LD63B350
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	—	LD62B400	LD63B400
	450	2000	2290	2570	2860	3140	3430	3710	4000	—	—	LD62B450	LD63B450
	500	3000	3430	3800	4290	4710	5140	5570	6000	—	—	LD62B500	LD63B500
HLD6(A)	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	—	—
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	—	—
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	—	—
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	—	—	—
	450	2000	2290	2570	2860	3140	3430	3710	4000	—	—	—	—
	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	—	—
HHLD6	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	HHLD62B250	HHLD63B250
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	HHLD62B300	HHLD63B300
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	HHLD62B350	HHLD63B350
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	—	HHLD62B400	HHLD63B400
	450	2000	2290	2570	2860	3140	3430	3710	4000	—	—	HHLD62B450	HHLD63B450
	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	HHLD62B500	HHLD63B500
CLD6	250	1250	1430	1610	1790	1960	2140	2320	2500	—	—	—	CJD63B250
	300	1250	1430	1610	1790	1960	2140	2320	2500	—	—	—	CJD63B300
	350	2000	2290	2570	2860	3140	3430	3710	4000	—	—	—	CJD63B350
	400	2000	2290	2570	2860	3140	3430	3710	4000	—	—	—	CJD63B400
	450	2000	2290	2570	2860	3140	3430	3710	4000	—	—	—	CLD63B450
	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	—	CLD63B500
LMXD6	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	—	—
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	—	—	—
	700	3200	3500	3700	4200	4700	6400	7300	8000	—	—	—	—
	800	2800	3100	3400	3700	4000	4800	5500	6000	—	—	—	—
	800	3200	3500	3700	4200	4700	6400	7300	8000	—	—	—	—
	800	3200	3500	3700	4200	4700	6400	7300	8000	—	—	—	—
LMD6	500	3000	3430	3860	4290	4710	5140	5570	6000	—	—	LMD62B500	LMD63B500
	600	3000	3430	3860	4290	4710	5140	5570	6000	—	—	LMD62B600	LMD63B600
	700	3200	3500	3700	4200	4700	6400	7300	8000	—	—	LMD62B700	LMD63B700
	800	3200	3500	3700	4200	4700	6400	7300	8000	—	—	LMD62B800	LMD63B800

Sentron Molded Case Circuit Breakers

Adjustable Instantaneous Magnetic Trip Settings

Application

Breaker Type	Maximum Continuous Amperes	Nominal AC Adjustable Trip Range								ETI Motor Circuit Protector Catalog Number	Thermal Magnetic Catalog Number		
		Low	2	3	4	5	6	7	High		3-Pole	2-Pole	3-Pole
HLMXD6	500 600 700 800	3000 3000 3200 3200	3430 3430 3500 3500	3860 3860 3700 3700	4290 4290 4200 4200	4710 4710 4700 4700	5140 5140 6400 6400	5570 5570 7300 7300	6000 6000 8000 8000	— — — —	— — — —	— — — —	HLMXD63B500 HLMXD63B600 HLMXD63B700 HLMXD63B800
HLMD6	500 600 700 800	3000 3000 3200 3200	3430 3430 3500 3500	3860 3860 3700 3700	4290 4290 4200 4200	4710 4710 4700 4700	5140 5140 6400 6400	5570 5570 7300 7300	6000 6000 8000 8000	— — — —	— — — —	— — — —	HLMD62B500 HLMD62B600 HLMD62B700 HLMD62B800
MD6	500 600 700 800 800 800	3000 3000 4000 3000 4000 5000	3430 3430 4570 3430 4570 5715	3860 3860 5140 3860 5140 6430	4290 4290 5710 4280 5710 7145	4710 4710 6280 4710 6280 7860	5140 5140 6850 5140 6850 8575	5570 5570 7420 5570 7420 9290	6000 6000 8000 6000 8000 10000	— — — MXD63L800 MXD63A800 MXD63H800	— — — — — —	MD62B500 MD62B600 MD62B700 — MD62B800 —	MD63B500 MD63B600 MD63B700 — MD63B800 —
MXD6	500 600 700 800 800 800	3000 3000 4000 3000 4000 5000	3430 3430 4570 3430 4570 5715	3860 3860 5140 3860 5140 6430	4280 4280 5710 4280 5710 7145	4710 4710 6280 4710 6280 7860	5140 5140 6850 5140 6850 8575	5570 5570 7420 5570 7420 9290	6000 6000 8000 6000 8000 10000	— — — MXD63L800 MXD63A800 MXD63H800	— — — — — —	MXD62B500 MXD62B600 MXD62B700 — MXD62B800 —	MXD63B500 MXD63B600 MXD63B700 — MXD63B800 —
HMD6	500 600 700 800	3000 3000 4000 4000	3430 3430 4570 4570	3860 3860 5140 5140	4280 4280 5710 5710	4710 4710 6280 6280	5140 5140 6850 6850	5570 5570 7420 7420	6000 6000 8000 8000	— — — —	— — — —	— — — —	HMD62B500 HMD62B600 HMD62B700 HMD62B800
HMXD6	500 600 700 800	3000 3000 4000 4000	3430 3430 4570 4570	3860 3860 5140 5140	4280 4280 5710 5710	4710 4710 6280 6280	5140 5140 6850 6850	5570 5570 7420 7420	6000 6000 8000 8000	— — — —	— — — —	— — — —	HMXD63B500 HMXD63B600 HMXD63B700 HMXD63B800
CMD6	400 500 600 700 800 800 800	3000 3000 3000 4000 3000 4000 5000	3430 3430 3430 4570 3430 4570 5715	3860 3860 3860 5140 3860 5140 6430	4280 4280 4280 5710 4280 5710 7145	4710 4710 4710 6280 4710 6280 7860	5140 5140 5140 6850 5140 6850 8575	5570 5570 5570 7420 5570 7420 9290	6000 6000 6000 8000 6000 8000 10000	— — — — CMD63L800 CMD63A800 CMD63H800	— — — — — — —	— — — — — — —	— — — — CMD63B600 CMD63B700 — CMD63B800 —
ND6	800 900 1000 1200	4000 5000 5000 5000	4570 5715 5715 5715	5140 6430 6430 6430	5710 7145 7145 7145	6280 7860 7860 7860	6850 8575 8575 8575	7420 9290 9290 9290	8000 10000 10000 10000	— — — —	— — — —	— — — —	ND62B800 ND62B900 ND62B100 ND62B120
NXD6	900 1000 1200	5000 5000 5000	5715 5715 5715	6430 6430 6430	7145 7145 7145	7860 7860 7860	8575 8575 8575	9290 9290 9290	10000 10000 10000	— — —	— — —	— — —	NXD62B900 NXD62B100 NXD62B120
HND6	800 900 1000 1200	4000 5000 5000 5000	4570 5715 5715 5715	5140 6430 6430 6430	5710 7145 7145 7145	6280 7860 7860 7860	6850 8575 8575 8575	7420 9290 9290 9290	8000 10000 10000 10000	— — — —	— — — —	— — — —	HND62B800 HND62B900 HND62B100 HND62B120
HNXD6	900 1000 1200	5000 5000 5000	5715 5715 5715	6430 6430 6430	7145 7145 7145	7860 7860 7860	8575 8575 8575	9290 9290 9290	10000 10000 10000	— — —	— — —	— — —	HNXD63B900 HNXD63B100 HNXD63B120
CND6	800 900 1000 1200	4000 5000 5000 5000	4570 5715 5715 5715	5140 6430 6430 6430	5710 7145 7145 7145	6280 7860 7860 7860	6850 8575 8575 8575	7420 9290 9290 9290	8000 10000 10000 10000	— — — —	— — — —	— — — —	CND63B800 CND63B900 CND63B100 CND63B120
PD6	1200 1400 1600	5000 5000 5000	5715 5715 5715	6430 6430 6430	7145 7145 7145	7860 7860 7860	8575 8575 8575	9290 9290 9290	10000 10000 10000	— — —	— — —	— — —	PD63B120 PD63B140 PD63B160
PXD6	1200 1400 1600	5000 5000 5000	5715 5715 5715	6430 6430 6430	7145 7145 7145	7860 7860 7860	8575 8575 8575	9290 9290 9290	10000 10000 10000	— — —	— — —	— — —	PXD63B120 PXD63B140 PXD63B160
HPD6	1200 1400 1600	5000 5000 5000	5715 5715 5715	6430 6430 6430	7145 7145 7145	7860 7860 7860	8575 8575 8575	9290 9290 9290	10000 10000 10000	— — —	— — —	— — —	HPD63B120 HPD63B140 HPD63B160
HPXD6	1200 1400 1600	5000 5000 5000	5715 5715 5715	6430 6430 6430	7145 7145 7145	7860 7860 7860	8575 8575 8575	9290 9290 9290	10000 10000 10000	— — —	— — —	— — —	HPXD63B120 HPXD63B140 HPXD63B160
CPD6	1200 1400 1600	5000 5000 5000	5715 5715 5715	6430 6430 6430	7145 7145 7145	7860 7860 7860	8575 8575 8575	9290 9290 9290	10000 10000 10000	— — —	— — —	— — —	CPD63B120 CPD63B140 CPD63B160
RD6	1800 2000	5000 5000	5715 5715	6430 6430	7145 7145	7860 7860	8575 8575	9290 9290	10000 10000	— —	— —	— —	RD63B180 RD63B200
RXD6	1800 2000	5000 5000	5715 5715	6430 6430	7145 7145	7860 7860	8575 8575	9290 9290	10000 10000	— —	— —	— —	RXD63B180 RXD63B200
HRD6	1800 2000	5000 5000	5715 5715	6430 6430	7145 7145	7860 7860	8575 8575	9290 9290	10000 10000	— —	— —	— —	HRD63B180 HRD63B200
HRXD6	1800 2000	5000 5000	5715 5715	6430 6430	7145 7145	7860 7860	8575 8575	9290 9290	10000 10000	— —	— —	— —	HRXD63B180 HRXD63B200

• Revised •
10/18/15

Sentron Molded Case Circuit Breakers

Molded Case Switch — Circuit Disconnect

Selection

Maximum Frame Amp Rating	2-Pole	3-Pole	Self-Protective Instantaneous Override $\pm 20\%$ ③
	Catalog Number	Catalog Number	
100	BQ2S060■ BQ2S100■	BQ3S060■ BQ3S100■	1000 1000
125	ED22S100A■ ED42S100A■ ED42S125A■ ED62S100A■ — CED62S100A■ CED62S125A■ — —	ED23S100A ED43S100A ED43S125A ED63S100A ED63S125A CED63S100A■ CED63S125A■ HES3S100L HES3S125L	1000 1000 1000 1000 1000 1000 1000 1250 1250
225	—	HQR23S250HA	2000
250	FXD62S250A HFXD62S250A■ ①	FXD63S250A HFXD63S250A■ CFD63S250A■	3200 3200 3200
400	JXD22S400A■ — — ①	JXD23S400A JXD63S400A HJXD63S400A■ CJD63S400A■	6000 6000 6000 6000
600	— — ①	LXD63S600A HLXD63S600A■ CLD63S600A■	6000 6000 6000
800	— — ①	LMXD63S800A■ MXD63S800A CMD63S800A	8000 8000 8000
1200	— ①	NXD63S120A CND63S120A■	10000 10000
1600	①	PXD63S160A②	10000
2000	①	RXD63S200A■⑤	10000

Ordering Information

Order by catalog number. Switches include frame and self protective trip unit only. Order lugs separately from pages 17/101 to 17/103.

■ Built to order. Allow 2–3 weeks for delivery.

① For 2-pole application use outside poles of 3-pole circuit breaker.

② For additional lugs see pages 7-88 to 7-90.

③ Molded case switches up to R frame contain a self protecting instantaneous element, which may open circuit above their override set point.

④ UL file E57556 Volume 1, section 2 and CSA LR 42022-51.

⑤ Requires mounting block MB9301 or MBR9302.

Lugs pages 17/101 to 17/103
Accessories pages 17/108 to 17/113

Sentron Molded Case Circuit Breakers

Digital Solid State Sentron Sensitrip III Series

Technical

The Sentron Sensitrip III circuit breaker is a true RMS current sensing device. Digital microprocessor circuitry within the electronic trip unit provides more precise control over the circuit breaker functions. This control allows circuit coordination flexibility not available with thermal magnetic circuit breakers.

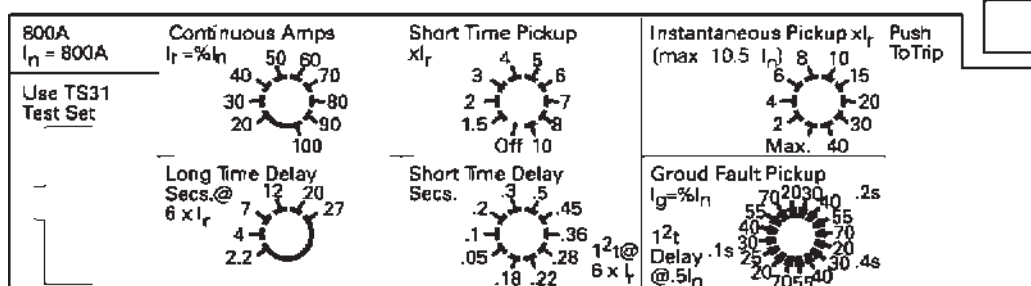
Functions available in Sentron Sensitrip circuit breakers

Catalog Number (Description + Suffix)	Trip Type	Cont Current Setting	Long Time Delay	Instan- taneous Setting	Short Time Pick Up	Short Time Delay	Short Time I ² t Pick Up	Ground Fault Pick Up	Ground Fault Delay
Basic Unit + (A)	LI	✓	✓	✓					
Basic Unit + (A)G	LIG	✓	✓	✓				✓	✓
Basic Unit + (A)NT	LSI	✓	✓	✓	✓	✓	✓		
Basic Unit + (A)NGT	LSIG	✓	✓	✓	✓	✓	✓	✓	✓

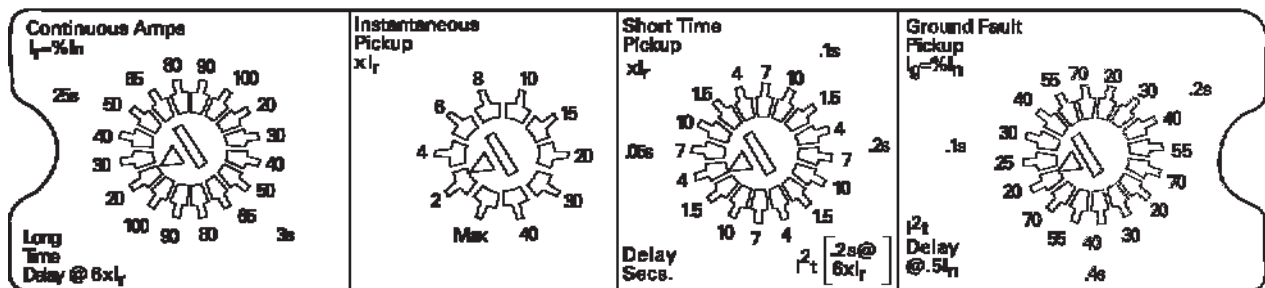
Letter "A" is used for MD and ND Solid State frame types only.

Typical Trip Unit Labeling and Adjustment Positions for the Sentron Sensitrip Circuit Breaker.

SMD6, SHMD6, SCMD6, SND6, SHND6, SCND6, SPD6, SHPD6



SJD6, SHJD6, SCJD6, SCD6, SHLD6, SCLD6



I_n = Maximum circuit breaker ampere rating.

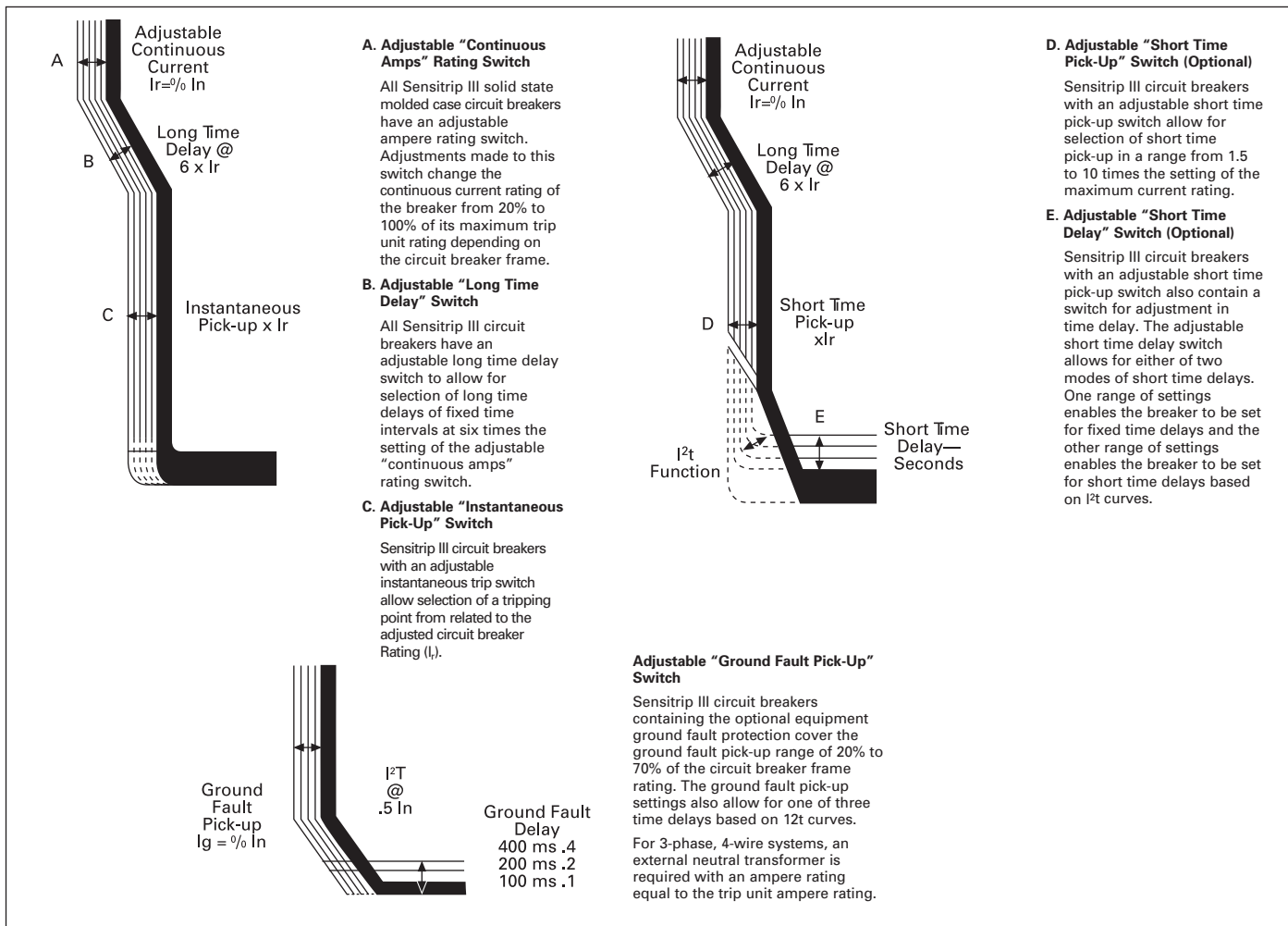
I_r = Current Rating — a function of continuous ampere adjustment setting expressed in % of I_n .

I_g = Ground Fault Pickup — a function of adjustment setting expressed in % of I_n .

Sentron Molded Case Circuit Breakers

Digital Solid State Sentron Sensitrip III Series

Technical



I_n = Maximum circuit breaker ampere rating.

I_r = Current Rating — a function of adjustment setting expressed in % of I_n.

I_g = Ground Fault Pick-up — a function of adjustment setting expressed in % of I_n.

Examples of Adjustment Settings

Catalog Number SMD69800A

I _n = 800	Continuous Current Setting	Long Time Delay Setting	Instantaneous Setting
I _n = 800 amperes Results	30 240 amperes I _r = 30% of 800	12 12 seconds trip at 6 x 240 amps = 1440.	8 1920 amperes 8 x I _r = 8 x 240

Catalog Number SMD69800ANGT

I _n	I _r Setting	Long Time Delay	Short Time Pick-Up Off	Instantaneous Setting	Short Time Pick-Up On	Short Time Delay	I ² T Set	Ground Fault Pick-Up	Ground Fault Delay
800 amperes Results Ⓐ	70 560 Ⓑ	20 20 sec. Ⓒ	— — Ⓓ	10 I _r 5600A Ⓔ	8 I _r 4480A Ⓕ	.5 .5 secs Ⓖ	.28 .28 sec @ 4480A Ⓗ	40 320A Ⓘ	.2 .2 sec Ⓢ

Ⓐ I_n = 800 amperes.

Ⓑ I_r = 560 amperes (70% of 800).

Ⓒ Delay = 20 seconds at 3360 amps (6 x I_r).
Breaker will trip in 20 seconds with 3360 amperes.

Ⓓ Short Time Pick-Up Off — Instantaneous can be used.

Ⓔ Instantaneous set at 10 x I_r = 10 x 560 = 5600 amperes.

Ⓕ Short Time Pick-Up On — Set at 8 x I_r = 8 x 560 = 4480 amperes.

Ⓖ Short Time Delay = .5 seconds. (Definite Time)
Note: Ⓖ & Ⓗ are mutually exclusive.

Ⓗ I²T switch on .28 seconds at 6 x 560 = 3360 amperes. (Inverse time)

Ⓘ Ground Fault Pick-Up set at 40 = 40% of I_n = 320 amperes. (Definite Time)

Ⓢ Ground Fault Delay set at .2 seconds. Breaker will trip in 200 milliseconds with a 400 ampere ground fault.

Sentron Molded Case Circuit Breakers

Electronic and Communications Accessories

Selection

Multiplexor Translator

Breaker Type	Features	Catalog Number
SJD, SLD SMD, SND SPD	Zone Interlocking Only	MTZ
	Full Communications with Zone Interlocking	MTA

The Multiplexor Translator MTZ is an interface device required in zone selective interlock schemes. The MTA combines the zone selective interlocking function with interface to ACCESS® Systems.

Cables & Connectors

Ribbon Cables

Breaker Type	Length	Catalog Number
SJD, SLD SMD, SND SPD	6"	EPC06
	8"	EPC08
	12"	EPC12■
	18"	EPC18
	24"	EPC24■

Telephone Cables

Breaker Type	Length	Catalog Number
SJD, SLD SMD, SND, SPD	8'	MTC08
	15'	MTC15
	25'	MTC25
	50'	MTC50

Expansion Plug

Breaker Type	Frame Size	Mounting Type	Catalog Number
Sensitrip	ALL	ALL	EP

The Expansion Plug EP is a required isolating device to connect the breaker with the Multiplexor Translator. It is connected to the trip unit on the breaker with a "Ribbon Cable", EPC08 e.g., and the Multiplexor Translator with the "Telephone Cable" (an RJ-11 cable) MTC50 e.g.

Component Selection Guide^①

Trip Units and Application		
Component Type	ZSI (only) with Sensitrip MCCB'S	Access and/or ZSI with Sensitrip MCCB's
EP	✓	✓
MTZ ^②	✓	
MTA ^②		✓
EPC Cable	✓	✓
MTC Cable ^③	✓	✓

■ Built to order. Allow 2-3 weeks for delivery.

▲ Built to order. Allow 6-8 weeks for delivery.

① When ordered with circuit breaker from the factory.

② One MTA or MTZ per eight trip units when required.

③ Always required when multiple MT's are used.

One additional cable per each additional MT.

Electronic & Display Devices

Trip Unit Test Set

Type	Catalog Number
SJD, SLD, SMD, SND, SPD, Portable	TS31
Spare TS-31 Test Set Interconnecting Cable	TS31CABLE

The TS-31 test set is used to test the operation of the fault protection functions of the circuit breaker's trip unit, including long-time, short-time, instantaneous, and ground fault by means of secondary current injections.

Sensitrip Ammeter Display Unit

Breaker Type	Catalog Number
SJD, SLD, SMD	SADU
SND, SPD	SADURMK18

The Sensitrip Ammeter Display Unit (SADU) provides real-time metering for all Sentron-Sensitrip III Molded Case Circuit Breakers. The unit plugs directly onto the front of the trip unit and provides displays for individual phase currents flowing through the breaker. Additional features include Average, Demand, Ground and Unbalance Current displays, along with impending Trip Status. Current Metering Logs, and a unique diagnostic Trip Log that records the date, time and type of fault for the previous five breaker trips. The device is UL and CSSA certified.

The optional panel mount accessory (SADURMK18) allows easy device mounting external from the circuit breaker, in panelboard and switch-board spaces or gutters, with the flexibility of interior panel exterior panel, or wall mounting capability.

The 2 x 16 alphanumeric LCD display provides easy viewing of data, such as viewing all three phase currents simultaneously.

SADU Ammeter Display Unit

- Direct plug-in or Panel Mounting*
- Trip Unit Powered & Battery back-up
- 2 x 16 LCD Alphanumeric Display*
- Ammeter Display Functions
 - RMS Phase Currents
 - Average Current*
 - Current Demand*
 - Ground Current
 - Current Unbalance (%)*
- Breaker Status
 - Normal
 - Impending Trip*
- Time Stamped Trip Log (last 5)
 - Time & Date*
 - Trip Cause: LT, ST, GF, SC
- Max Log (with date & time)
 - Max Phase Current*
 - Max Average Current*
 - Max Ground Current*
 - Max Unbalance Current*
 - Max Current Demand*

* Unique Features



For Use With Type(s)	Circuit Breaker Ampere Rating	Cables Per Lug	Lug Wire Range	Catalog Number
BQ, BQH, BQHF BQE, BQF, BL, BLH, HBL, HBQ Switching Neutrals BG, BLG	Line Side			
	15–40	1 1	#14–#6 AWG Cu #12–#6 AWG Al	TC1Q1 ^{①②}
	45–125	1 1	#8–#1 AWG Cu #6–#1/0 AWG Al	TA1Q1 ^②
	Load Side			
	15–20	1 1	#14–#10 AWG Cu #12–#10 AWG Al	Lugs are integral to Circuit Breaker
	25–35	1 1	#14–#6 AWG Cu #12–#6 AWG Al	
	40–50	1 1	#8–#6 AWG Cu #8–#4 AWG Al	
	55–70	1 1	#8–#4 AWG Cu #8–#2 AWG Al	
	80–100	1 1	#4–#1/0 AWG Cu #2–#1/0 AWG Al	
	110–125	1 1	#2–#1/0 AWG Cu #1/0–#2/0 AWG Al	
BQD, CQD BQD6, CQD6	Line Side (CQD, CQD6) & Load Side			
	15–40	1	#14–#6 AWG Cu #12–#6 AWG Al	Integral
	45–100	1	#8–#1 AWG Cu #6–#1/0 AWG Al	Integral
NGG, HGG, LGG	15–30	1	#14–#6 AWG Cu #12–#6 AWG Al	TC1Q1
	15–30	1	#14–#6 AWG Cu #12–#6 AWG Al	3TC1Q1 (pkg. of 3)
	35–125	1	#8–#1/0 AWG Cu #8–#2/0 AWG Al	3TC1GG20 (pkg. of 3)
	15–125	—	NUT KEEPER PLATE	TNKG3 ^③ (pkg. of 3)
NEG, HEG	15-125	1	#14-3/0 AWG Cu	3TW1EG30 (pkg. of 3)
	15-125	1	#14-1/0 AWG Cu/Al	3TA1EG10 (pkg. of 3)
	15-125	1	#6-3/0 AWG Cu/Al	3TA1EG30 (pkg. of 3)
	15-125	—	Nut Keeper Kit (3-pole)	TNKE3 (pkg. of 3)
	15-125	—	Nut Keeper Kit (4-pole)	TNKE4 (pkg. of 4)

Connector wire ranges and cavities are established in conjunction with Table 6.1.4.2.1 of UL 489 standards.

Note:

(A) Molded case circuit breakers having a rated ampacity of 125 amperes or less are to be connected with 60 or 75°C wire. Circuit breakers having a rated ampacity greater than 125 amperes shall only be cabled with 75°C cable unless otherwise indicated on the circuit breaker label. Exceptions to this rule are outlined in article 110-14 C(1)(2) of the 2005 National Electrical Code.

(B) Connector wire ranges and cavities are established in conjunction with Table 6.1.4.2.1 of UL 489 standards.

- ① Lug is steel.
- ② Sold in package of six.
- ③ One nut keeper plate is required with each lug on the NGG breaker.

Lug information

Aluminum Body Lugs for Copper or Aluminum Wire

• Revised •
10/18/15

Selection

For Use With Type(s)	Circuit Breaker Ampere Rating	Cables Per Lug	Lug Wire Range	Catalog Number
QR2, QR2H, HQR2, HQR2H	100-250	1	#3 - 1/0 Al/Cu 2/0 AWG - 300 Kcmil	3TA1QR300
All 2, 3-pole ED2, ED4, ED6, ED6 ETI, HED4, HHED6	15-25	1	#14-#10 AWG (Cu) #12-#10 AWG (Al)	SA1E025
	30-100	1	#10-#1/0 (Cu or Al)	LN1E100
	110-125	1	#3-3/0 (Cu) #1-2/0 (Al)	TA1E6125
CED6 All 1-pole ED, HED	30-60	1	#10-4 (Cu or Al)	LD1E060 (Load Side)
	70-100	1	#4-#1/0 (Cu or Al)	LD1E100 (Load Side)
FXD6-A, FD6-A, HFD6, CFD6 HHFD6	70-250	1	#6 AWG-350 kcmil (Cu) #4 AWG-350 kcmil (Al)	TA1FD350A
SJD6(A), SHJD6(A) SCJD6	65-200	1-2	#4 AWG-3/0 (Cu or Al)	TA2J630
JXD2(A), JXD6(A), JD6(A), SJD6(A), HJD6(A), HJXD6(A) HHJXD6, HHJD6, SHJD6(A), CJD6, SCJD6	200-400	1-2	3/0-500 kcmil (Cu) 4/0-500 kcmil (Al)	TA2J6500
LXD6(A), LD6(A), SLD6(A), HLD6(A), HLXD6(A), HHLXD6, HHL6, SHLD6(A), CLD6, SCLD6	250-600	1-2	3/0-500 kcmil (Cu) 4/0-500 kcmil (Al)	TA2J6500
LMD6 ^① , LMXD6 ^① , HLM6 ^① , HLMXD6 ^① , MD6, MXD6, SMD6, HMD6, HMXD6, SHMD6, CMD6, SCMD6	500-600	1-2	#1-500 kcmil (Cu or Al)	TA2K500
		1-3	1/0-500 kcmil (Cu or Al)	TA3K500
	500-800	1-2	500-750 kcmil (Cu or Al)	TA2N750 ^②
ND6, NXD6, SND6, HND6, HNXD6, SHND6, CND6, SCND6	800-1200	1-4	250-500 kcmil (Cu or Al)	2TA4P8500 ^{③③} 3TA4P8500 ^{③④}
			250-500 kcmil (Cu or Al)	2TA4N8500 ^③ 3TA4N8500 ^④
PD6, HPD6, CPD6 PXD6, HPXD6, SPD6, SHPD6	1200-1600	1-5	300-600 kcmil (Cu or Al)	TA5P600
PD6, PXD6, HPD6, HPXD6, SPD6, SHPD6, RD6, RXD6, HRD6, HRXD6, STD	1200-2000	1-6	300-600 kcmil (Cu or Al)	TA6R600

①Use TA2K500 or TA3K500 only.

②Used for 100% rated MD/ND frame breakers.
Rated for 90° C cable.

③Contains 2 connectors plus 1 NDTs end barrier.

④Contains 3 connectors plus 1 NDTs end barrier.

• Revised •
10/18/15

Lug information Optional Mechanical Lugs

Selection

For Use With Type	Circuit Breaker Ampere Rating	Cables Per Lug	Lug Material	Lug Wire Range	Qty Per Catalog No	Catalog Number
QR2, QR2H, HQR2, HQR2H	100-250	1	Cu	#3 - 1/0 Cu ONLY) 2/0 AWG - 300 kcmil Cu ONLY	3	3TC1QR250
ED, HED 1, 2 & 3-pole	1, 2 & 3-pole 30-125	1	Cu	#10-#1/0 (Cu)	1	TC1ED6150
HFD6, HHFD6, CFD6, F(X)D6-A	70-250	1	Cu	#6 AWG-350 kcmil (Cu)	1	TC1FD350
J(X)D2(A), J(X)D6(A), HJD6(A), HHJD6, SHJD6(A), L(X)D6(A), HHL6, SCD6, HLD6(A), SHLD6(A), CJD6, CLD6, SCJD6, SCLD6	200-600	1 1-2	Cu	3/0-600 kcmil (Cu) 3/0-500 kcmil (Cu)	1 1	TC1J6600 ^① TC2J6500 ^①
	250-600	1 1	Al	500-750 kcmil (Al) 500-600 kcmil (Cu)	1	TA1L6750
SMD6, M(X)D6, HM(X)D6, HMD6,	500-600	1-2 1-3	Cu	#1 AWG-500 kcmil (Cu) #1 AWG-350 kcmil (Cu)	1 1	TC2K500 TC3K350
CMD6, SCMD6, SND6, N(X)D6, HN(X)D6, SHND6, CND6, SCND6	700-800	1-2	Al	500-750 kcmil (Cu) 500-750 kcmil (Al)	2 3	2TA2N8750 3TA2N8750
	800-1200	1-3	Al	500-750 kcmil (Cu) 500-750 kcmil (Al)	2 3	2TA3N8750 3TA3N8750
R(X)D6, HR(X)D6	1600-2000	1-5	Cu	300-600 kcmil (Cu)	1	TC5R600
P(X)D6, HP(X)D6, CPD6, SPD6, SHPD6	1200-1600	1-4	Al	600-750 kcmil (Cu/Al)	1	TA4P750▲

Compression Lugs

For Circuit Breaker Types	Ampere Rating	Poles	Lugs Per Kit	Lug Wire Size	Catalog Number
Lugs (contains indicated number of lugs and necessary hardware per kit)					
ED2, ED4, ED6, HED4, HHED6, CED6	15-125	1, 2, 3	1	#2/0 AWG Cu/Al	CCE125
QR2, QR2H, HQR2, HQR2H	100-250	2-3	1	#6 - 350kcmil Al/Cu	CCQ225
F(X)D6-A, HF(X)D6, HHF(X)D6, CFD6	125-250	2, 3	1	350 kcmil	CCF250
JXD2-A, J(X)D6-A, HJ(X)D6-A, HHJ(X)D6-A, CJD6, SJD6-A, SHJD6-A, SCJD6, L(X)D6-A, HL(X)D6-A, CLD6, SLD6-A, SHLD6-A, SCLD6	200-600	2, 3	1	500 kcmil	CCL600
Kits (contain lugs and hardware for complete line or load end of 2 or 3-pole breaker)					
M(X)D6, HM(X)D6, CMD6, SMD6, SHMD6, SCMD6	500-800	2 3	6 9	500 kcmil	CCM800K2 CCM800K3
N(X)D6, HN(X)D6, CND6, SND6, SHND6, SCND6	900-1200	2 3	8 12		CCN1200K2 CCN1200K3

Distribution Lugs^②

For Circuit Breaker Types	Ampere Rating	Poles	Lugs Per kit	Wires Per Lug	Lug Wire Size	Catalog Number
NGG, HGG, LGG	15-125	1,2,3	1	6	#6-#4 AL #14-#4 Cu	TA6GG04
NEG, HEG	15-125	1,2,3	3	3	#14-#2 AWG Cu	3TA3EG02
NEG, HEG	15-125	1,2,3	3	6	#14-#6 AWG Cu	3TA6EG06
ED2, ED4, ED6, HED4, HHED6, CED6	15-125	1,2,3	1	6	#14-#4 AWG Cu #6-#4 AWG Al	TA6ED06
F(X)D6-A, HF(X)D6, HHF(X)D6, CFD6	70-250	2,3	1	6	#14-#4 AWG Cu #6-#4 AWG Al	TA6FD04
JXD2-A, J(X)D6-A, HJ(X)D6-A, HHJ(X)D6-A, CJD6-A, SJD6, SHJD6-A, SCJD6, L(X)D6-A, HL(X)D6-A, CLD6-A, SLD6-A, SHLD6-A, SCLD6	200-600	2,3	1	6	#14-2/0 AWG Cu #6-2/0 AWG Al	TA6JD20

▲ Built to order. Allow 6-8 weeks for delivery.

① Used for 100% rated JD/LD frame circuit breakers.

② Special purpose wire connectors, not for general use.

Molded Case Circuit Breakers

Modifications

• Revised •
10/18/15

General Selection

A variety of internal and external accessories, as well as modifications, are available to adapt Siemens circuit breakers to special installation requirements. UL listed internal accessories for 100 through 2000A circuit breakers are field-addable.

Internal accessories fine tune an electrical distribution system, allowing control of the circuit breakers to meet special application requirements. For example, emergency situations may dictate tripping critically placed circuit breakers quickly. Shunt trips accomplish this conveniently and efficiently. Or, when voltage drops are a concern, undervoltage trips automatically open the circuit breaker at a predetermined voltage level.

A wide range of external operating and mounting accessories is also available. For example, face, shallow, and back mounting plates are ideal for tailoring BQ circuit breakers to OEM applications. A complete line of operating handles and handle-blocking devices meet switchboard, enclosure and safety needs. Plug-in mounting assemblies, which simplify switchboard mounting of circuit breakers and permit breaker removal without disconnecting bus or cable connections, are available.

50°C Ambient Calibration — Not UL listed and not available for solid state, 100% rated breakers or 400HZ calibrated breakers.

For BL Type Circuit Breakers

— Add suffix 'M' to catalog number
(Example: B120M)No Charge

For BQ and ED Frame Circuit Breakers

— Replace 'B' in catalog number with 'M'No Charge
(Example: BQ3M060, QJ23M200, ED63M060)

For FD, JD, LD, LMD, MD, ND, PD, and RD Frame Circuit Breakers

Non-Interchangeable Trip (3-pole only)No Charge
— Replace 'B' in catalog number with 'M'
(Example: FXD63M225, JXD63M400)

400 HZ Calibration

UL Listed (5KA IR)

For BQ & BL Type Circuit Breakers (200A max.)Add 25% to list price

— Add suffix 'Y' to catalog number

Not UL Listed

For all other Circuit Breakers, see derating tables on page 6-152 and order standard circuit breakers.

Fungus Proofing

All BOD, CQD, GB, GG, ED, FD, JD, LD, LMD, MD, ND, PD, RD, DG, FG, JG, LG, MG, NG, and PG Frame Circuit Breakers are inherently fungus resistant and do not require special treatment.

For BL, and BQ Type Circuit BreakersAdd \$10.00 net per pole

— Consult Sales Office for Availability

For all other Circuit Breaker TypesAdd \$160.00 net per device

— Consult Sales Office for Availability

Certificate of Compliance with Test Report (catalog number CERT OF COMP.) Add \$210.00 net

Certificate of compliance testing must be performed on the actual device being shipped.

The certificate cannot be provided after initial shipment. Order for devices with COC requirement must be placed directly with the factory by the sales office and shipped directly to the end user.

UL 489 Supplement SB Naval Use Breakers

Breakers tested to UL 489 Supplement SB are qualified for use on non combat and auxiliary naval vessels.

Siemens molded case breakers, including BL, NGB and Sentron ED through RD frames can be labeled "NAVAL" in compliance with UL 489 Supplement SB.

Supplement SB testing comprises two sets of vibration tests. The first is to find mechanical resonances in the product and to subject the breaker to extreme testing at each resonant frequency. The second is a swept frequency test, in which the frequency of excitation is changed in intervals of 1Hz, and held at each frequency for five minutes. The excitation frequencies run from 4 to 33Hz, and the test is conducted in each of the three orthogonal axes of the breaker.

During these tests, the breaker must not trip from the closed position, nor may the contacts touch from the open position. Calibration and insulation resistance are also verified during the test.

For detailed information, refer to UL 489, Supplement SB.

Ordering Information

For "NAVAL" label, add **\$75.** net per catalog number per order. Order must be placed directly with the factory by Siemens Sales Office.

Types	UL File
BOD/CQD	E10848, Vol 10, Sec 1
GG	E10848, Vol 10, Sec 2
GB	E10848, Vol 10, Sec 3
ED2, ED4, IIED4, HED6	E10848, Vol 4, Sec 11
CED6	E10848, Vol 4, Sec 13
FD6, FXD6, HFD6, HFXD6	E10848, Vol 4, Sec 17
CFD6	E10848, Vol 4, Sec 18
JXD2, JD6, JXD6, LXD6, LD6, HJD6, HJXD6, HLD6, HLXD6	E10848, Vol 4, Sec 8
HHJD6, HHJXD6, HHL6, HHLXD6	E10848, Vol 4, Sec 20
CJD6, CLD6	E10848, Vol 4, Sec 14
MD6, MXD6, HMD6, HMXD6, CMD6, ND6, NXD6, HND6, HNXD6, CND6	E10848, Vol 4, Sec 15
PD6, PXD6, HPD6, HPXD6, CPD6, RD6, RXD6, HRD6, HRXD6	E10848, Vol 4, Sec 19

Feature Combinations

The available feature combinations are shown in the chart below. For applications requiring combinations of features not listed in this chart, consult the sales office for availability.

Breakers	Modules Per Breaker	Avail. On Breaker Poles	ST	ST/ AUX	ST/ ALSW	ST/ AUX/ ALSW	UVT	UVT/ AUX	UVT/ ALSW	UVT/ AUX/ ALSW	AUX	AUX/ ALSW	ALSW	Elect. Bell Alarm	Ground fault	Grd fault w/Bell
QP, BQ, BL ^①	1	1, 2, 3	1	—	—	—	—	—	—	—	1, 2	—	—	—	—	—
BQD, CQD, GB, GG	1	2, 3	1	1/1	—	—	—	—	—	—	1, 2	1/1	1	—	—	—
QR ^①	1, 2	2, 3	1	1/1	—	—	—	—	—	—	2	—	—	—	—	—
All ED	1	1, 2, 3	1	1/1, 1/2	1/1	1/1, 1/1	1	1/1, 1/2	1/1	1/1, 1/1	1, 2	1/1, 2/1	1	—	1	1
All FD	2	2, 3	1	—	—	—	1	1/1	—	—	1, 2	1/1	1	—	—	—
All JD, LD, LMD ^②	2	2, 3	1	1	—	—	1	1/1, 1/2	—	—	1, 2	1/1, 1/2	1, 2	—	—	—
SJD6, SHJD6, SCJD6, SLD6, SHLD6, SCLD6 ^③	1	3	1	1	—	—	1	1/1, 1/2	—	—	1, 2	1/1, 1/2	1, 2	—	—	—
All MD, ND, PD, RD Including Electronic trip ^④	2	2, 3	1	1/1	—	—	1	1/1, 1/2	—	—	1, 2	1/1, 2/1	1, 2	—	—	—
STD ^⑤	6	3	1	—	—	—	1	—	—	—	1 NC / 1 NO, 2 NC / 2 NO, 3 NC / 3 NO, 4 NC / 4 NO, 5 NC / 5 NO, 6 NC / 6 NO	—	1	1	—	—

Shunt Trip (ST)

One or all critical circuit breakers may be tripped from a distant control point by use of a shunt trip device. A shunt trip operates through an auxiliary switch contact; when the breaker opens, current is not maintained on the shunt trip coil.

Undervoltage Trip (UVT)

When voltage drops to a value below 35% of the nominal coil rating, the undervoltage trip device automatically opens the breaker. The operation is instantaneous, and the circuit breaker cannot be reclosed until the

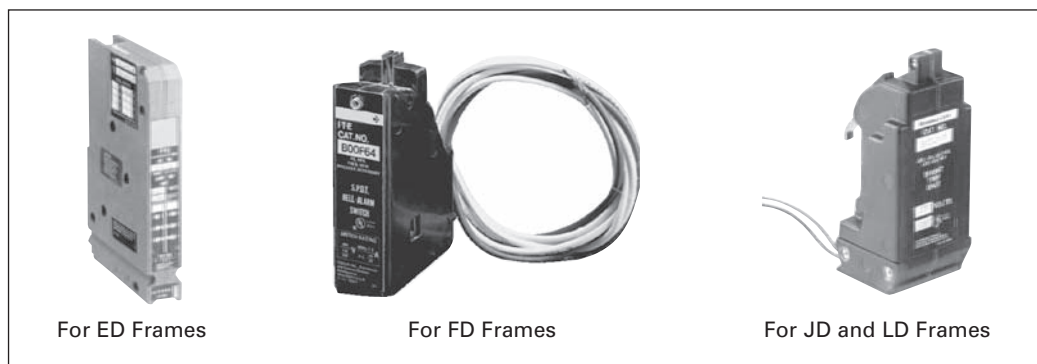
voltage returns to 85% of line voltage. The undervoltage trip, which is continuously energized, must be energized before the circuit breaker can be closed.

Auxiliary Switch (AUX)

For applications requiring remote "on" or "off" indication (or electrical interlocking), auxiliary switches are available. Each switch comprises an "A" (open when circuit breaker is open) and a "B" (closed when circuit breaker is open) contact with a common connection. (Form C)

Alarm Switch (ALSW)

The alarm switch contact is closed when the circuit breaker is opened automatically by an overload, short circuit, shunt trip or undervoltage trip. The alarm switch contact is open when the circuit breaker is reset.



①Factory assembled only

②If mechanical interlock is installed, no accessory module can be installed in the right pocket.

③If mechanical interlock is installed, no accessory module can be installed.

④If mechanical interlock is installed, no accessory module can be installed in the left pocket.

⑤One module per column.

Circuit Breaker Accessories ④⑤⑥⑦⑧⑨

Catalog Number	For Use With Breaker Type	Number of Poles	Standard Package
Padlocking Device For locking breaker in "OFF" position. Note "ON" position does not affect breaker functionally			
ECPLD1	Type QP, BL, QAF2, QPF, QE, QT-Duplex, BQ, BQXD	1P	3 Pieces
ECPLD2	Type QP, BL, QAF2, QPF, QE, QT-Triplex & Quadplex, BQ, BQXD	2P	3 Pieces
ECPLD2R	Type QP, BL, QAF2, QPF, QE, QT-Triplex & Quadplex, BQ, BQXD (Red Color)	2P	3 Pieces
ECPLD3	Type QP, BL, QAF2, QPF, QE, BQ	3P	1 Piece
ECPLD3R	Type QP, BL, QAF2, QPF, QE, BQ (Red Color)	3P	1 Piece
ECQLD3	Type QP, BL, BQ, BQXD	1P	10 Pieces
ECQLD4	Type QT-Duplex	QT-Duplex Breakers	10 Pieces
ECQLN3②	150-225 MBKA, QN, QNR	n/a	1 Piece
ECQTH4	Type QP, BL, BQH	Designed for (3) 1P Breakers	1 Piece
Handle Tie Provide simultaneous switching of 2 adjacent handles.			
ECQTH2	Type QT Duplex	Designed for (2) QT Duplex Breakers	25 Pieces
ECQTH3	Type QP, BL	2P	50 Pieces
Mechanical Interlock①			
ECQML12	Type QP, BL, BQ Interlock Bracket	Designed for 1" Breaker	10 Pieces
Handle Blocking Device For holding breaker in "ON" or "OFF" position. Not a lockout/tagout device			
ECQL1	Type QP, BL, BQ, BQXD	1P	10 Pieces
ECBX231M	Type QT-Duplex	1/2" Breakers	10 Pieces
Main Breaker Retainer			
ECMBR1③	EQ Load Centers		1 Piece
ECMBR2	Ultimate Load Centers		1 Piece
Mounting Accessories			
MB120	Type BQ, BQH Mounting Clips	1P	20 Pieces
FP9508	Type BQ, BQH FACE MOUNT PLATE	1P	10 Pieces
FP9555	Type BQ, BQH FACE MOUNT PLATE	2P	10 Pieces
FP9556	Type BQ, BQH FACE MOUNT PLATE	3P	10 Pieces
SMB6R	Type BQ MOUNTING BRACKET	1P, 2P, 3P	6 Pieces
TCH65K	Type BQ MOUNTING ADAPTER		500 Pieces
BR2	Type BQ, BQH, BQXD Back Mounting Plates	2P	10 Pieces
BR3	Type BQ, BQH, BQXD Back Mounting Plates	3P	10 Pieces
BR4	Type BQ, BQH, BQXD Back Mounting Plates	4P	10 Pieces
I0204ML1125	Type QP Back Mounting Plates	1P, 2P	10 Pieces
I0303ML3100	Type QP Back Mounting Plates	3P	10 Pieces
Replacement Lugs			
TA1Q1	Type BQ, NGG 100A AI Cu LGS	n/a	6 Pieces
TC1Q1	Type BQ, NGG 40A AI Cu LUGS	n/a	6 Pieces
Finger Shield			
BQFS1K	Type BQXD Finger Shield (Bulk Pack)	n/a	1000 Pieces
BQFS2	Type BQXD Finger Shield	n/a	2 Pieces
Filler Plate			
ECQF3	1" Filler Plate	n/a	5 Pieces

① For a complete list of standby power mechanical interlock kits, see the Standby Generator Section.

② For use with Ultimate Load Center Main Breakers

③ Not suitable for use on 15-50A, 10 AIC Type QP Circuit Breakers

④ QP Type includes QPH, HQP

⑤ BL Type includes BLH, HBL

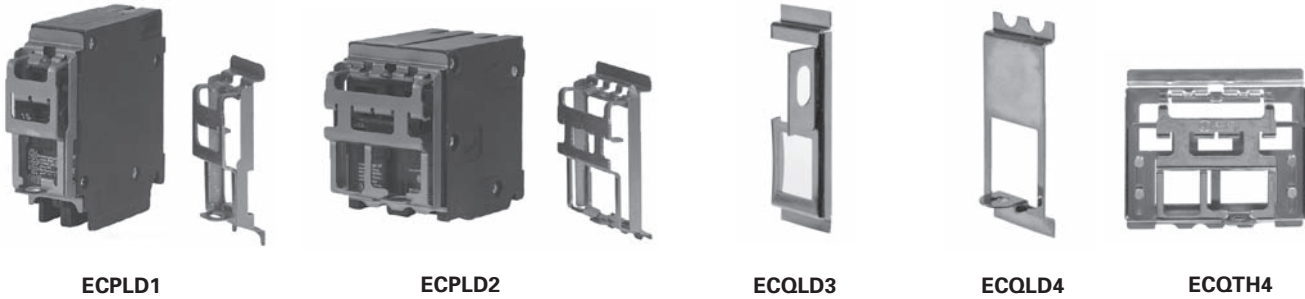
⑥ BQ Type includes BQH, HBQ

⑦ QAF2 Type includes QAFH2, BAF2, BAFH2, QFGA2, QFGAH2, BFGA2, BFGAH2

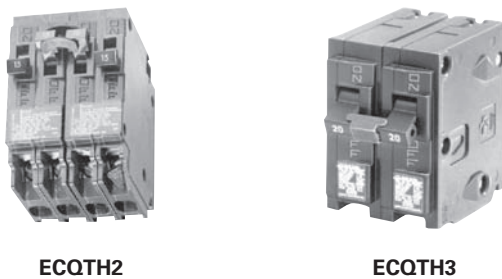
⑧ QPF Type includes QPHF, BLF, BLHF

⑨ QE Type includes QEH, BLE, BLEH

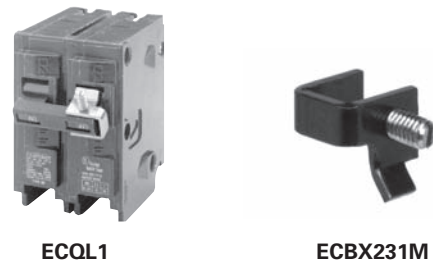
Padlocking Device



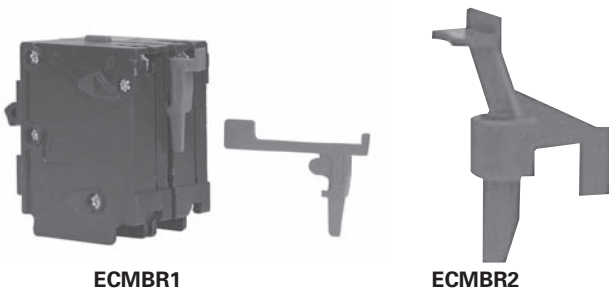
Handle Tie



Handle Blocking Device



Main Breaker Retainer



Mechanical Interlock



Mounting Accessories



Sentron Molded Case Circuit Breakers

External Accessories

• Revised •
10/18/15

Selection

Handle Ties with Padlock Device

Provide simultaneous switching of 2 or 3 adjacent handles.
Do not provide common trip.

For Use With Breaker Frame(s)	Catalog Number	Standard Package	Wt Lb/ Std Pkg
BQD, NGB, HGB, LGB	BQDHT2	10	½
	BQDHT3	10	½

Padlocking Devices

For locking breaker in "OFF" position.

All QR	HPLQR	10	¼
All BQD, CQD, NGB, HGB, LGB	BQDPLD	1	⅞
NGG, HGG, LGG	HPLG	1	¼
EB, 1- thru 3-pole	HPLB	1	⅞
EG, 3- and 4-pole only	HPL	1	¼
All ED	ED2HPL	1	¼
All FD	FD6PL1	1	¼
All JD, LD, LMD	JD6HPL	1	¼
All MD, ND, PD, RD	MN6PLD	1	¼

Handle Blocking Devices

For holding breaker in "ON" or "OFF" position.
Not a lockout/tagout device.

All QR	HBLQR	25	1
All BQD, CQD, GG, GB	BQDHBD	1	¼
EG	HBDE	1	¼
All ED	E2HBL	1	¼
All FD	FD6HB1	1	½
All JD, LD, LMD	JD6HBL	1	½
All MD, ND, PD, RD	MN6BL	1	½

Handle Extensions

For replacement. One extension shipped with breaker.

All MD, ND, PD, RD	EX11	1	2
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Terminal Shields

Breaker Type	Poles	Catalog Number	Standard Package
NGG, HGG, LGG	3	TSSG3A	1



FD Padlocking Device
FD6PLI



FD Handle Blocking Device
FD6HB1



Handle Extension
EX11

■ Built to order. Allow 2-3 weeks for delivery.

Ⓢ Sold only in standard package quantities.

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Sentron Molded Case Circuit Breakers

External Accessories

Selection

Face Mounting Plates

For Use With Breaker Frame(s)	Number of Poles	Catalog Number	Standard Package	Wt Lb/ Std Pkg
CQD, CQD6	1	CQDFMB1	1	¼
	2	CQDFMB2■	1	¼
	3	CQDFMB3■	1	¼
NGG, HGG, LGG	1	FMPG1	1	¼
	2	FMPG2	1	¼
	3	FMPG3	1	¼

Back Mounting Plates

ED2, ED4, ED6, HED4, HED6	1	E2BMB	1	¼
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Mounting Screw Kits

CQD, CQD6	CQDSMK ^①	1	1¼
NGG, HGG, LGG	MSKG4 ^①	1	¼
All QR	MSQR3	1	1
All ED (CED6 requires 2 kits)	MSE6 ^①	1	¼
	MSE6100 ^②	100 ^④	1
All FD (CFD6 requires 2 kits)	MSF6 ^①	1	¼
	MSF650 ^③	50 ^④	1
All EG 1-pole	MSKE1	—	—
All EG 2-pole	MSKE2	—	—
All EG 3 or 4-pole	MSKE4	—	—
All JD, LD	MSJ6 ^①	1	¼
All LMD	MSLMD	1	¼
All MD, ND,	MSMN	1	¼
All PD, RD	MSPR6	1	2



“MI” Mechanical Interlocks

For Use With Breaker Type(s)	Panel ^⑦ Mounted	Plug-in Mounted	Standard Package	Wt Lb Std Pkg
All EG (Sliding Bar)	HSBE	—	1	—
All QR (Sliding Bar)	SBMIQR	—	1	1
All FD	MI5444	MI5444	1	—
All JD, LD	MI5413 ^④	—	1	1
All LMD	MI5406 ^④ ■	—	1	1
All MD	MI5404 ^⑤ ■	—	1	3
All ND	MI5404 ^⑤ ■	—	1	3
All PD, RD	MI5405 ^⑥ ▲	—	—	—

■ Built to order. Allow 2–3 weeks for delivery.

▲ Built to order. Allow 6–8 weeks for delivery.

① Kit consists of 4 screws and washers.

② Consists of 1 screw and washers (order 100).

③ Consists of 1 screw and washers (order 50).

④ With mechanical interlock in place, no accessory can be installed into circuit breaker right pole.

⑤ Addition of the mechanical interlock will prevent accessory installation in the left pole.

⑥ Sold only in standard package quantities. Multiply List Price Each times package quantity for full price.

⑦ Mechanical interlock is not designed for use within Siemens panelboards.

Sentron Molded Case Circuit Breakers

External Accessories

• Revised •
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Selection

Rotary Door Mounted Operating Handles Types 1, 3, 3R, 12, 4 4X

For Use With Breaker Frames	Complete Mechanism		Handle Only	Breaker Operator	Shaft Only	
	Catalog Number		Catalog Number	Catalog Number	Length (inches)	Catalog Number
	Standard Depth	Variable Depth				
EG	RHVE64X	RHVE124X	—	—	—	—
ED ^①	CRHOESD	CRHOEVD	CRHOH ^③	RHOEBO	2	RHOSSD
FD	CRHOFSD	CRHOFVD		RHOFBO	12	RHOSVD
JD, LD	CRHOJSD	CRHOJVD		RHOJBO	16	RHOSXD
LMD	CRHOLMSD	CRHOLMVD		RHOLMBO	—	—
MD, ND PD, RD	RHONSD	RHONVD	RHOH ^③	RHONBO ^④	3 12 24	RHONSSD▲ RHONSVD RHONSXD

Rotary Door Mounted Operating Handles Types 1 & 12

For Use With Breaker Frames	Standard Depth Catalog Number	Variable Depth Catalog Number	Handle and Shaft Catalog Number	Breaker Operator Catalog Number
CQD, NGG, HGG, LGG	—	RHOCQVD	RHOH62	CQDOP
ED	D11CEU1	D11CEU2	—	—
FD	D11CFU1▲	D11CFU2	—	—
JD, LD	—	D11CJU2	—	—

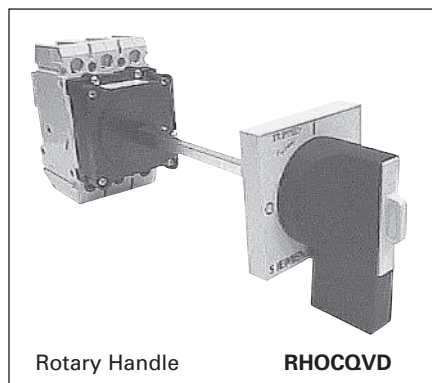
For CQD, NGG, HGG and LGG red emergency handle, order assembly **RHOCQVDE** (includes handle and operator).▲
For CQD, NGG, HGG and LGG in a NEMA 3R enclosure, order **CQDOP34** operator, **RHOH** handle and **RHOSVD** shaft.
For CQD, NGG, HGG and LGG in a NEMA 4 or 4X enclosure, order **CQDOP34** operator, **RHOH4** handle and **RHOSVD** shaft.

Through Door Mounted Operating Handles^② Types 1 & 12

For Use With Breaker Frames	Standard Depth	Variable Depth
	Catalog Number	Catalog Number
CQD, NGG, HGG, LGG	FMHOS	—
EG (3 & 4-Pole only)	RHFESD	—
EG (red handle)	RHFESDEM	—
ED	E2RH1	E2RHV9
FD	F6RH1	F6RHV9

Door Latch Kits

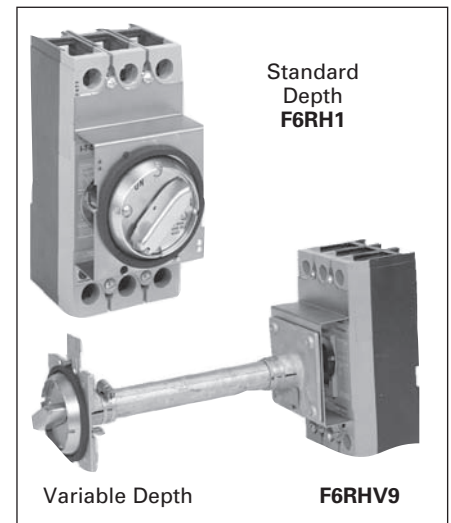
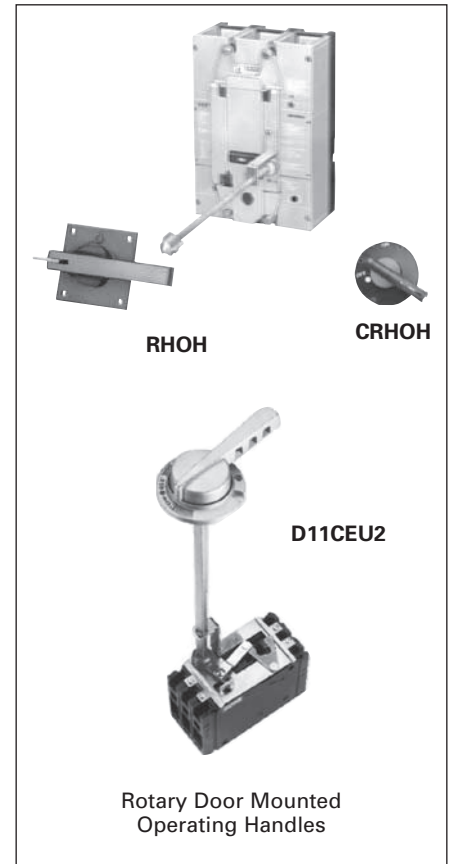
Type	Catalog Number	Catalog Number
	Right Hand	Left Hand
2 point latch	DKR2	DKL2■
3 point latch	DKR3	DKL3■



- Built to order. Allow 2–3 weeks for delivery.
- ▲ Built to order. Allow 6–8 weeks for delivery.
- ① For use on 3-pole ED frame only.

- ② Meets the requirements of NFPA 79, section 5.3.3.1 for locking external operator disconnecting devices.
- ③ For 3 or 3R, order shaft and breaker operator as shown, and handle **RHOH**. For 4 & 4X, order handle **RHOH4**. Consult sales office for additional EG operator shaft lengths.

- ④ For extended shaft support order catalog number **RHONSB2**.



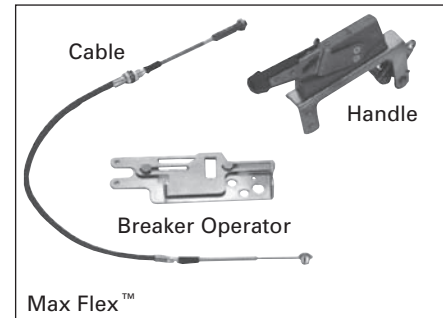
Sentron Molded Case Circuit Breakers

External Accessories

Selection

Max-Flex™, Flange Mounted Variable Depth Operators^③

Frames	NEMA Type	Complete Kit Catalog Number	Handle Only Catalog Number	Breaker Operator Catalog Number	36" Cable Catalog Number
NGG	1, 3 (R), 12	MFKG3R3	MFHM3R	MFMG	MFCF036
	4 (x)	MFKG4X3	MFHM4X		
EG	1, 3 (R), 12	MFKE3 ^④	—	—	—
	4 (x)	MFKE4X3	—		
ED	1, 3 (R), 12	FHOE036 ^①	FHOH	FHOEBO ^①	FHOEC036
	4 (x)	—	FHOH4		
FD	1, 3 (R), 12	FHOF036	FHOH	FHOFBO	FHOF036
	4 (x)	—	FHOH4		
JD, LD, SJD, SLD	1, 3 (R), 12	FHOJ036	FHOH	FHOJBO	FHOJC036
	4 (x)	—	FHOH4		
LMD	1, 3 (R), 12	FHOLM036	FHOH	FHOLMBO	FHOJC036
	4 (x)	—	FHOH4		
MD, ND, PD, RD, SMD, SND, SPD	1, 3 (R), 12	FHON048	FHOHN	FHONBO	FHONC048 ^②
	4 (x)	—	FHOHN4		



Max-Flex™ handles are available with solid black handles instead of the customary “red for on” flange handle. These are preferred for use in IEC markets, where red handles have specific meaning. Order components separately, appending the letter “i” to the catalog number (e.g. FHOHI).

Alternate Length Cable Only

	ED	FD	JD/LD/LMD	MD/ND/PD/RD
Inches	Catalog Number	Catalog Number	Catalog Number	Catalog Number
48	FHOEC048	FHOFC048	FHOJC048	FHONC048
60	FHOEC060	FHOFC060	FHOJC060	FHONC060
72	FHOEC072	FHOFC072	FHOJC072	FHONC072
84	FHOEC084▲	FHOFC084▲	FHOJC084▲	FHONC084▲
96	FHOEC096	FHOFC096	FHOJC096	FHONC096
120	FHOEC120▲	FHOFC120	FHOJC120▲	FHONC120▲
144	FHOEC144▲	FHOFC144▲	FHOJC144▲	FHONC144▲

Handle Auxiliary Switch

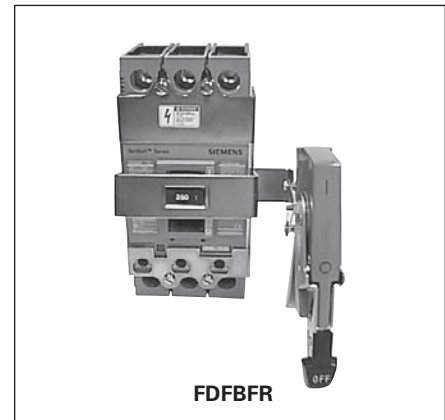
For use with Max-Flex and Rotary Door operators (FHOH and RHOH). 1 NO and 1 NC contact (Form C).

For Use With	Catalog Number
ED, FD, JD, LD, LMD, ND, PD, RD, SD, Max Flex	HAS1

Fixed Depth Flange Mounting

Frames	Minimum Enclosure Depth	NEMA Type	Left Hand Mount	Right Hand Mount
			Catalog Number	Catalog Number
ED ^⑤	6.44	1, 3R, 12	FDFBEL▲	FDFBER▲
		4, 4X	FDFBEL4▲	FDFBER4▲
FD	6.44	1, 3R, 12	FDFBFL▲	FDFBFR▲
		4, 4X	FDFBFL4▲	FDFBFR4▲

Max-Flex™ handles are available with solid black handles instead of the customary “Red for On” flange handle. These are preferred for use in IEC markets, where red handles have specific meaning. Order components separately, appending the letter “i” to the catalog number (e.g. FHOHI).



▲ Built to order. Allow 6–8 weeks for delivery.

① For 1- or 2-pole breaker order FHOED036 complete kit or FHOEDBO breaker operator only. Use MFHM3R handle.

② 48 inch cable is standard length for M through R frame Max-Flex operators.

③ Meets requirements of NFPA 79, section 5.3.3.1 for locking external operator disconnecting devices

④ Consult sales office for additional cable lengths for EG Flex Shaft Operators. For 3-Pole only.

⑤ 3-Pole ED only.

Sentron Molded Case Circuit Breakers

External Accessories

Selection/Dimensions

Telemand® Motor Operator

Breaker Frame	AC Voltage	Hinged to Open Down Catalog Number
ED except CED	120	MOE6120
	240	MOE6240▲

ED motor operator opens downward.

Breaker Frame	DC Voltage	Hinged to Open Right Catalog Number	AC Voltage	Hinged to Open Right Catalog Number
FD	24	MOF6024DC▲	120	MOF6120
	48	MOF6048DC▲	240	MOF6240
	125	MOF6125DC▲		
JD, LD	24	MOJ6024DC▲	120	MOJ6120
	48	MOJ6048DC▲	240	MOJ6240
	125	MOJ6125DC▲		
LMD	24	MOLMD6024DC▲	120	MOLMD6120
	48	MOLMD6048DC▲	240	MOLMD6240
	125	MOLMD6125DC▲		
MD, ND, PD, RD	—	—	120	MOMN6120
	—	—	240	MOMN6240

To order FD through RD motor operators with Left side hinges, add "L" to catalog number (e.g. MOF6120L). List prices are the same.▲

Dimensions

Frame	A	B	C	D	E	F
ED	7.04	4.31	—	4.31	13.84	8.84
FD	9.50	4.55	1.60	6.84	9.70	7.58
JD, LD, LMD	11.00	7.50	0.79	8.34	9.85	7.74
MD, ND, PD, RD	16.00	9.00	—	9.83	13.13	10.13

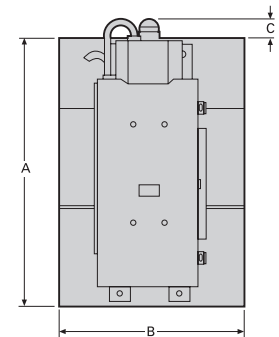
Operating Currents

Catalog Number	On			Off			Reset (Amps)
	In-Rush (Amps)	Running (Amps)	Time (msec)	In-Rush (Amps)	Running (Amps)	Time (msec)	
MOE6120	10.25	2.3	550	10	2.3	400	2.3
MOE6240	5.2	1.1	500	5	1	330	1.1
MOF6120/L	13.6	5.5	200	13.6	5.5	175	5.5
MOF6240/L	7.6	3.5	200	7.6	3.5	185	3.5
MOLMD6120/L	13.6	6	210	13.6	6	185	6
MOJ6120/L	13.6	6	210	13.6	6	185	6
MOJ6240/L	7.6	3.5	217	7.6	3.5	185	3.5
MOMN6120/L	30.2	13.2	240	30.2	13.2	210	13.2
MOMN6240/L	14.7	6	260	14.7	6	230	6

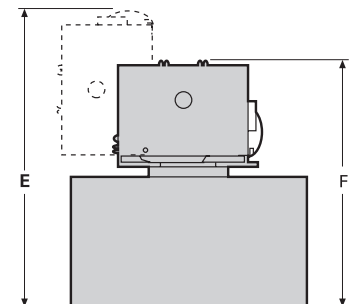


Telemand Motor Operator

FD, JD, LD, LMD, MD, ND, PD, RD Frames



Front View



Bottom View

For inches / millimeters conversion, see Application Data section.

▲ Built to order. Allow 6-8 weeks for delivery.

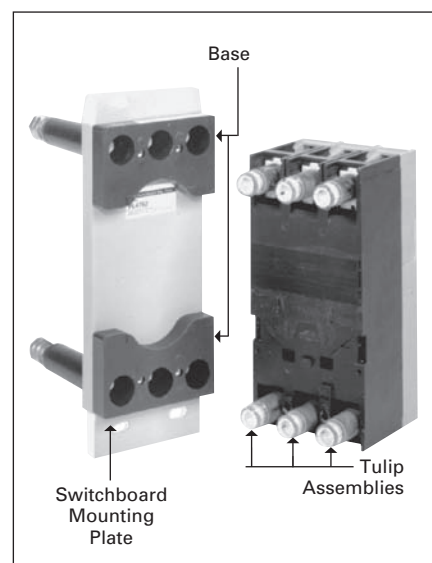
Sentron Molded Case Circuit Breakers

External Accessories

Selection

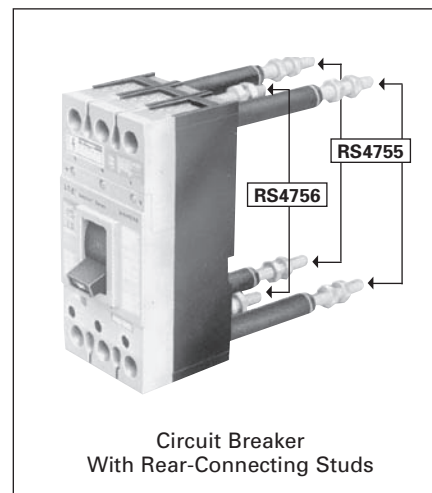
Plug-In Mounting Assemblies, Including Base and Tulip Assemblies

For Use With Breaker Frames	Poles	Line Side	Load Side	Steel Switchboard Mounting Plate ^① Catalog Number
		Catalog Number ^②	Catalog Number ^②	
EG	3	PCBERC3 ^③	—	—
	4	PCBERC4 ^③	—	
All ED except CED	2	PC2637▲	PC2638▲	PL2616
	3	PC2657	PC2658	
CED	2	PC2637▲	PC2638▲	PL2617
	3	PC2657	PC2658	
All FD except CFD	2	PC4753▲	PC4753▲	PL4762
	3	PC4754	PC4754	
CFD	2	PC4753▲	PC4753▲	PL4763
	3	PC4754	PC4754	
All JD except CJD	2	PC5777▲	PC5777▲	PL5796
	3	PC5778	PC5778	
Kit CJD, SCJD	3	PCCJD	PCCJD	PL5797
All LD except CLD	2	PC5660▲	PC5660▲	PL5680
	3	PC5661	PC5661	
Kit CLD, SCLD	3	PCCLD	PCCLD	PL5797
All MD	2	PC5662▲	PC5662▲	PL9698
	3	PC5663	PC5663	
All ND	2	PC5664 ^③ ▲	PC5664 ^③ ▲	PL9699
	3	PC5666 ^③	PC5666 ^③	



Tulip Assemblies Separately

For Frame	2-Pole	3-Pole
	Catalog Number	Catalog Number
ED	TCE2▲	TCE3▲
FD	TCF2▲	TCF3▲
JD	TCJ2▲	TCJ3▲
LD	TCL2▲	TCL3▲
MD	TCM2▲	TCM3▲
ND	TCN2▲	TCN3▲



Rear-Connecting Studs

For Use With Breaker Frames	Ampere Rating	Description	Extension Behind Breaker (inches)	Line Side	Load Side
				Catalog Number ^④	Catalog Number ^④
All ED	100	Line Side (Short)	2.38	RS2643 ^⑤ ▲	—
	100	Load Side (Short)	2.38	—	RS2644 ^⑤ ▲
	100	Line Side (Long)	4.88	RS2641 ^⑤ ▲	—
	100	Load Side (Long)	4.88	—	RS2642 ^⑤ ▲
All FD	250	Short	3.12	RS4756 ^⑤ ▲	RS4756 ^⑤ ▲
	250	Long	7.06	RS4755 ^⑤ ▲	RS4755 ^⑤ ▲
All JD	400	Short	5.85	RS5774▲	RS5774▲
	400	Long	11.20	RS5773▲	RS5773▲
All LD	600	Short	5.85	RS5784▲	RS5784▲
	600	Long	11.20	RS5783▲	RS5783▲
CJD, SCJD CLD, SCLD	Add required shield kit.				CLRSJL3
LM(X)D6, HLM(X)D6	800	Short	5.85	RS5788▲	RS5788▲
		Long	11.20	RS5787▲	RS5787▲
All MD, ND	1200	Short	5.50	RS5786▲	RS5786▲
	1200	Long	8.00	RS5785▲	RS5785▲

▲ Built to order. Allow 6–8 weeks for delivery.

①Furnished at no extra charge when ordered with plug-in mounting assembly.

②Each piece catalog number consists of (1) mounting block assembly and required tulip assemblies (2) for 2-pole, (3) for 3-pole

③For vertical bus mounting — for horizontal, substitute PC5665 for PC5664 and PC5667 for PC5666.

④Price includes one current stud, insulating tube, stud nuts and terminal shields, when required.

⑤For proper electrical clearance, studs must alternate between short and long stud lengths on circuit breaker poles (e.g. SLSLSL or LSLSL).

⑥Plug-in assembly for EG breakers include line and load side in one assembly.

Molded Case Circuit Breakers

Unusual Operating Conditions

• Revised •
10/18/15

Reference

Note: The information provided on this and the next page is intended for reference and recommendation only. Because several variables can act on a circuit breaker's performance at the same time, the data below is based less on controlled testing, than on experience and engineering judgment. Contact Siemens for further information on special conditions and treatment.

High Ambient Temperatures

Because thermal-magnetic trip breakers are temperature sensitive and calibrated for a specific ambient of 40°C (104°F) (average enclosure temperature), a higher ambient will cause the breaker to trip at lower current than its nameplate rating, in other words, causing the breaker to "derate" (see Table 1). Similarly, the current carrying capacity of a circuit conductor is based upon a certain ambient temperature, a higher ambient will reduce its current carrying capacity, causing it to "derate." Thus, with a fluctuating temperature, a thermal-magnetic breaker will derate nearly parallel with its connected circuit conductors and maintain close circuit protection. If the application temperature exceeds 40°C (104°F) and is known, either a breaker specially calibrated for the higher ambient or one oversized according to Table 1 may be selected. In a case such as this, the circuit conductors should be oversized as well. Siemens Sensitrip® III and Type SB Encased Systems Breakers are insensitive to temperature changes. However, they do include circuitry to protect the components from abnormally high temperatures.

Moisture — Corrosion

For atmospheres having high moisture content and / or where fungus growth is prevalent, a special preventive treatment may be required.

Where the air is heavily laden with corrosive elements, breakers made with special corrosion-resistant finishes may be required.

Altitude

Reduced air density at altitudes greater than 6600 ft. (2000 meters) affects the ability of a molded case circuit breaker to transfer heat and interrupt faults. Therefore, circuit breakers applied at these altitudes should have interrupting, insulation and continuous currents derated as indicated in Figure 1.

Table 1 — Temperature Derating Data for Thermal-Magnetic Breakers

Reference Ampere Rating at 40°C (104°F)	Ampere Rating at:			Siemens Breaker Frames
	25°C (77°F)	50°C (122°F)	60°C (140°F)	
15	17	13	11	BQ, BL, BQD, CQD, GG, GB, ED
20	22	18	16	
25	28	23	21	
30	33	28	26	
35	39	30	25	
40	44	37	34	
50	55	46	42	
60	66	56	52	
70	77	65	60	
90	99	84	78	
100	110	94	87	QR FD JD LD MD ND PD RD
125	137	114	100	
150	165	136	120	
175	192	159	140	
200	220	182	160	
225	247	205	180	
250	275	235	220	
300	330	276	252	
350	385	325	301	
400	440	372	340	
500	550	468	435	
600	660	564	525	
700	770	658	613	
800	880	754	704	
900	990	828	749	
1000	1100	900	825	
1200	1320	1090	1000	
1400	1540	1304	1148	
1600	1760	1500	1320	
1800	1980	1690	1485	
2000	2200	1880	1650	

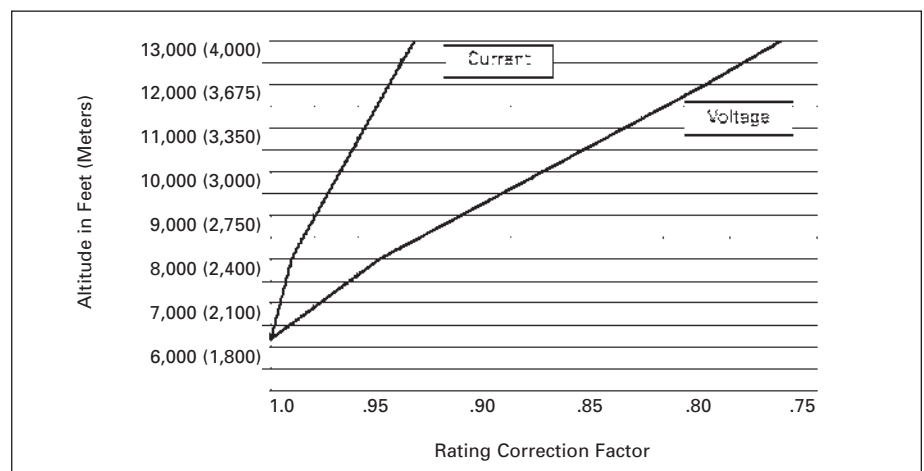


Figure 1 — Altitude Adjustment

400 Hz Systems^①

Siemens molded case circuit breakers can be applied for overcurrent protection on 400Hz systems, commonly used to power computer installations, aircraft, military and other specialty equipment. Below are basic guidelines.

Circuit Breaker Derating Required

This table lists the maximum continuous current carrying capacity for Siemens breakers at 400Hz. Due to the increased resistance of the copper sections resulting from the skin effect produced by eddy currents at these frequencies, circuit breakers in many cases require derating. The thermal derating on these devices is based upon 100%, three phase application in open air in a maximum of 40°C (104°F) with 48 in. (1219 mm) of the specified cable or bus at the line and load side. Additional derating of not less than 20% will be required if the circuit breaker is to be utilized in an enclosure. Further derating may be required if the enclosure

ambient temperature exceeds 40°C (104°F).

Cable and Bus Sizing

The cable and bus sizes to be utilized at 400Hz are not based on standard National Electric Codes tables for 60Hz application. Larger cross sections are necessary at 400Hz. All bus bars specified are based upon mounting the bars in the vertical plane to allow maximum air flow. All bus bars are spaced at a minimum of 0.25 in. (6 mm) apart. Mounting of bus bars in the horizontal plane will necessitate additional drafting. Edgewise orientation of the bus may change the maximum ratings indicated. If additional information is required for other connections of cable or bus, contact Siemens for information.

Application Recommendations

It is recommended that temperatures be measured on the line and load terminals or T-connectors of the center pole. These

are usually the hottest terminals with a balanced load. A maximum temperature of 75°C (35°C over a maximum ambient of 40°C) would verify the particular application. Temperature profiles taken on these breakers can be correlated to ensure that the hottest points within the breaker are within the required temperature limits.

Factory Configuration

When required, molded case circuit breakers may be factory calibrated for 400Hz application. These breakers are specially labeled for 400Hz usage and their nameplate current rating will include the necessary derating factor. The highest "Maximum Continuous Amperes" rating at 400Hz, found in the table below approximates the highest specially calibrated 400Hz nameplate ampere rating available for a given frame size. Contact Siemens for ordering information on other breakers applied in 400Hz systems.

400Hz Breakers

Siemens Breaker Type	Maximum Continuous Ampere Rating At 40°C (104°F) ^②			75°C (167°F) Copper Cable per Pole	
	60HZ		Enclosed After Derating	No of Pieces	Wire Size
	Open Air	Open Air ^③			
ED2, ED4, ED6, BOD, HED4, HED6, CED6	15	15	12	1	#14
	20	20	16	1	#12
	25	25	20	1	#10
	30	30	24	1	#10
	35	35	28	1	#10
	40	40	32	1	#8
	45	43	34	1	#8
	50	48	38	1	#8
	60	57	46	1	#6
	70	67	54	1	#4
	80	76	61	1	#4
	90	86	69	1	#3
QR2, QR2H, HQR2, HQR2H, FD6, FFX6, HFD6, HFXD6, CFD6	100	95	76	1	#3
	110	105	84	1	#2
	125	119	95	1	#1
	70	63	50	1	#4
	80	72	58	1	#4
	90	80	64	1	#3
	100	90	72	1	#3
	110	95	75	1	#2
	125	105	84	1	#1
	150	125	100	1	#1/0
	175	140	112	1	#2/0
	200	160	128	1	#3/0
JXD2, JD6, JXD6, HJD6, HJXD6, HHJD6, HHJXD6, CJD6	225	180	144	1	#4/0
	250	200	160	1	250 kcmil
	200	170	136	1	#3/0
	225	190	152	1	#4/0
	250	210	168	1	250 kcmil
	300	240	192	1	350 kcmil
	350	260	208	1	500 kcmil
	400	300	240	2	#3/0
	200	170	170	2	#3/0
	225	190	190	2	#4/0
	250	210	210	1	250 kcmil
	300	240	240	1	350 kcmil
JD6, JXD6, HJD6, HJXD6 100% Rated	350	260	260	1	500 kcmil
	400	300	300	2	#3/0

Siemens Breaker Type	Maximum Continuous Ampere Rating At 40°C (104°F) ^②			75°C (167°F) Copper Cable per Pole	
	60HZ		Enclosed After Derating	No of Pieces	Wire Size
	Open Air	Open Air ^③			
LD6, LXD6, HLD6, HLXD6, HHLXD6, CLD6	250	210	168	1	250 kcmil
	300	240	192	1	350 kcmil
	350	260	208	1	500 kcmil
	400	300	240	2	#3/0
	450	340	272	2	#4/0
	500	375	300	2	250 kcmil
	600	420	336	2	350 kcmil
	250	210	210	1	250 kcmil
	300	240	240	1	350 kcmil
	350	260	260	1	500 kcmil
	400	300	300	2	#3/0
	450	340	340	2	#4/0
LD6, LXD6, HLD6, HLXD6, 100% Rated	500	375	375	2	250 kcmil
	600	420	420	2	350 kcmil
	500	400	320	2	250 kcmil
	600	430	360	2	350 kcmil
	700	500	400	3	250 kcmil
	800	560	448	3	300 kcmil
	500	400	400	2	250 kcmil
	600	430	430	2	350 kcmil
	700	500	500	3	250 kcmil
	800	560	560	3	300 kcmil
	800	560	448	3	300 kcmil
	900	600	480	3	350 kcmil
MD6, MXD6, HMD6, HMXD6, CMD6	1000	650	520	3	400 kcmil
	1200	780	624	4	350 kcmil
	900	600	600	3	350 kcmil
	1000	650	650	3	400 kcmil
	1200	780	780	4	350 kcmil
	1200	780	624	4	400 kcmil
	1400	850	680	4	500 kcmil
	1600	960	768	5	500 kcmil
	1200	780	780	4	400 kcmil
	1400	850	850	4	500 kcmil
	1600	960	960	5	500 kcmil
	1600	960	768	5	500 kcmil
ND6, NXD6, HND6, HNXD6, CND6	1800	1080	864	5	500 kcmil
	2000	1200	960	6	500 kcmil
	1200	780	624	4	400 kcmil
	1400	850	680	4	500 kcmil
	1600	960	768	5	500 kcmil
	1200	780	780	4	400 kcmil
	1400	850	850	4	500 kcmil
	1600	960	960	5	500 kcmil
	1600	960	768	5	500 kcmil
	1800	1080	864	5	500 kcmil
	2000	1200	960	6	500 kcmil
	1200	780	624	4	400 kcmil

①The information provided on this page is intended for reference and recommendation only. Because several variables can act on a circuit breaker's performance at the same time, the data above is based less on

controlled testing, than on experience and engineering judgment. Contact Siemens for further information on special conditions and treatment.

②Additional derating may be required if the ambient

temperature is greater than 40°C (104°F).

③Calculated after derating to compensate for the heating of the copper conductor, caused by the skin effect generated by eddy currents produced at 400/415Hz.

Molded Case Circuit Breakers

Unusual Operating Conditions

Reference

Unusual Operating Conditions 400 Hz Systems

Circuit Breaker Derating Required

This table lists the maximum continuous current carrying capacity for Siemens breakers at 400Hz. Due to the increased resistance of the copper sections resulting from the skin effect produced by eddy currents at these frequencies, circuit breakers in many cases require derating. The thermal derating on these devices is based upon 100%, three phase application in open air in a maximum of 40°C (104° F) with 48 in. (1219 mm) of the specified cable or bus at the line and load side. Additional derating of not less than 20% will be required if the circuit breaker is to be utilized in an enclosure. Further derating may be required if the enclosure ambient temperature exceeds 40°C(104° F).

Cable and Bus Sizing

The cable and bus sizes to be utilized at 400Hz are not based on standard National Electric Codes tables for 60Hz application. Larger cross sections are necessary at 400Hz. All bus bars specified are based upon mounting the bars in the vertical plane to allow maximum air flow. All bus bars are spaced at a minimum of 0.25 in. (6 mm) apart. Mounting of bus bars in the horizontal plane will necessitate additional drafting. Edgewise orientation of the bus may change the maximum ratings indicated. If additional information is required for other connections of cable or bus, contact Siemens for information.

Application Recommendations

It is recommended that temperatures be measured on the line and load terminals or T-connectors of the center pole. These are usually the hottest terminals with a balanced load. A maximum temperature of 75°C (35°C over a maximum ambient of 40°C) would verify the particular application. Temperature profiles taken on these breakers can be correlated to ensure that the hottest points within the breaker are within the required temperature limits.

Interrupting Rating

Circuit breakers used in 400 Hz systems are limited to a 5000 A interrupting rating. If higher ratings are required, consult Siemens.

Breaker type	Maximum continuous ampere rating at 40°C (104°F)②			75°C (167F) Copper cable per pole	
	60HZ	400HZ	Enclosed after derating	No of pieces	Wire size
	Open air	Open air③			
DG	50	48	38	1	#8
	60	57	46	1	#6
	70	63	50	1	#4
	80	72	58	1	#4
	90	80	64	1	#3
	100	90	72	1	#3
	110	95	75	1	#2
	125	105	84	1	#1
FG	150	125	100	1	#1/0
	100	90	72	1	#3
	110	95	75	1	#2
	125	105	84	1	#1
	150	125	100	1	#1/0
	175	140	112	1	#2/0
	200	160	128	1	#3/0
	225	180	144	1	#4/0
JG	250	200	160	1	250 kcmil
	250	210	168	1	250 kcmil
	300	240	192	1	350 kcmil
	350	260	208	1	500 kcmil
JG 100% Rated	400	300	240	2	#2/0
	250	210	210	1	250 kcmil
	300	240	240	1	350 kcmil
	350	260	260	1	500 kcmil
LG	400	300	300	2	#3/0
	400	300	240	2	#3/0
	500	375	300	2	250 kcmil
	600	420	336	2	350 kcmil

Breaker type	Maximum continuous ampere rating at 40°C (104°F)②			75°C (167F) Copper cable per pole	
	60HZ	400HZ	Enclosed after derating	No of pieces	Wire size
	Open air	Open air③			
LG	400	300	240	2	#3/0
	500	375	300	2	250 kcmil
	600	420	336	2	350 kcmil
MG	600	430	360	2	350 kcmil
	700	500	400	3	250 kcmil
	800	560	448	3	300 kcmil
MG 100% Rated	600	430	430	2	350 kcmil
	700	500	500	3	250 kcmil
	800	560	560	3	300 kcmil
NG	800	560	448	3	300 kcmil
	900	600	480	3	350 kcmil
	1000	650	520	3	400 kcmil
	1200	780	624	4	350 kcmil
NG 100% Rated	900	600	600	3	350 kcmil
	1000	650	650	3	400 kcmil
	1200	780	780	4	350 kcmil
	1200	780	624	4	400 kcmil
PG	1400	850	680	4	500 kcmil
	1600	960	768	5	500 kcmil
	1200	780	780	4	400 kcmil
PG 100% Rated	1400	850	850	4	500 kcmil
	1600	960	960	5	500 kcmil

① The information provided on this page is intended for reference and recommendation only. Because several variables can act on a circuit breaker's performance at the same time, the data above is based less on controlled testing, than on experience and engineering

judgment. Contact Siemens for further information on special conditions and treatment.

② Additional derating may be required if the ambient temperature is greater than 40°C (104°F).

③ Calculated after derating to compensate for the heating of the copper conductor, caused by the skin effect generated by eddy currents produced at 400/415Hz.

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Pages

Heavy Duty Safety Switch Standards and Ratings

Standards

- UL98 approved per file #E4776
- Suitable for use as service entrance equipment (where applicable)
- Meets NEMA standard KS-1-1990 for Type HD switches
- Seismic qualification – all switches have been tested and comply with the 2007 California Building Code CBC (Zone 4)

Ratings

- 30-1200A, 240V and 600V AC and DC
- 2, 3, 4 and 6 pole fusible and non-fusible
- All HD safety switches are both HP and load break rated
- Enclosures are available to meet NEMA 1, 3R, 12 & 4/4X requirements

Safety Switch AIC Ratings When Protected by Fuses

- 30-600A – 10,000 AIC with Class H fuses
- 30-600A – 200,000 AIC with Class R, J or T fuses
- 800 & 1200A – 200,000 AIC with Class L or T fuse

Fuse Provisions supplied in fusible switches

- 30 & 60A 240V – Class H standard, Class R with kit
- 100-600A 240V – Class H standard, Class J by moving load base, Class R with kit
- 30-600A 600V - Class H standard, Class J by moving load base, Class R with kit
- 100 & 200A - Class T with kit
- 400 & 600A - Class H standard, Class J & T by moving load base, Class R with kit
- 800A – Class L standard, Class T by moving load base
- 1200A – Class L standard, Class T with kit (240V max)

Non-Fusible Safety Switch AIC Ratings When Protected by a Circuit Breaker^{①②}

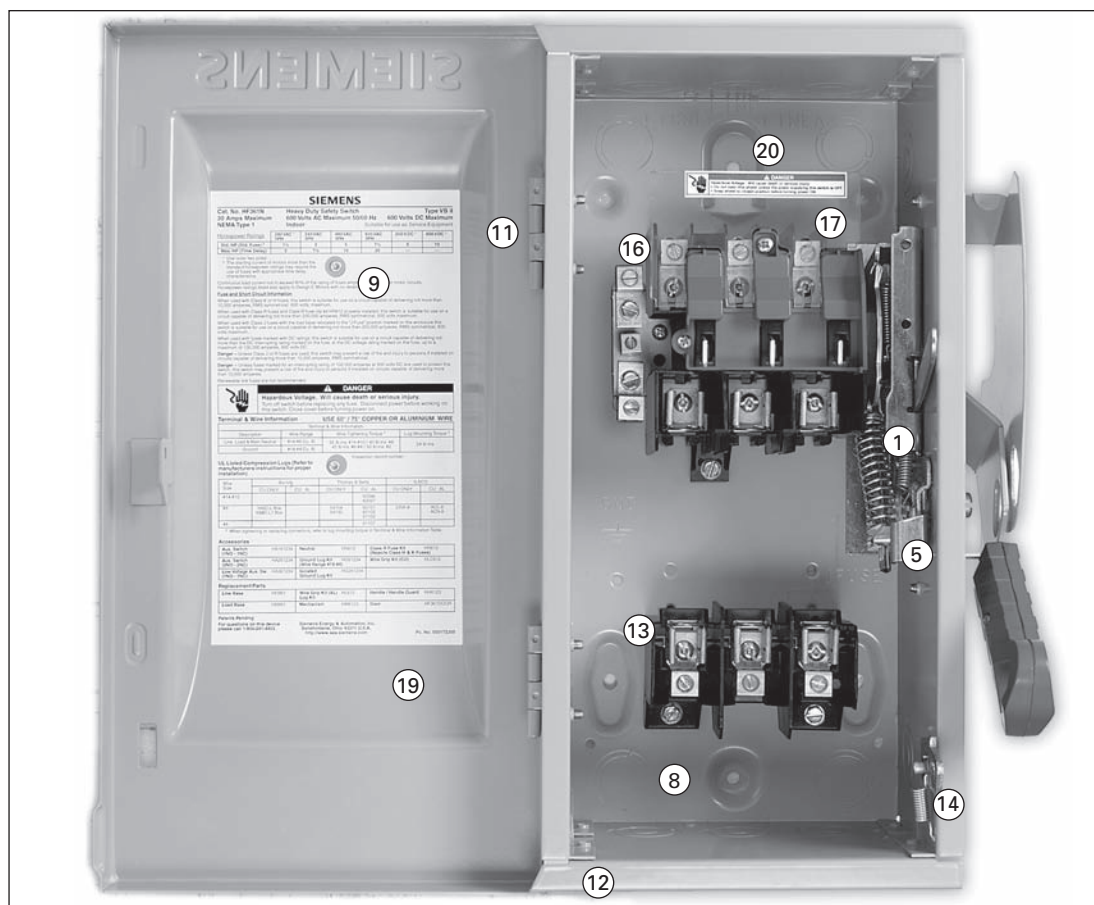
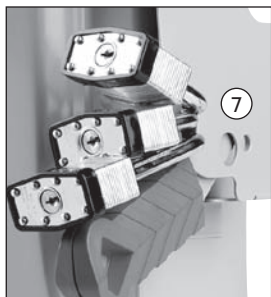
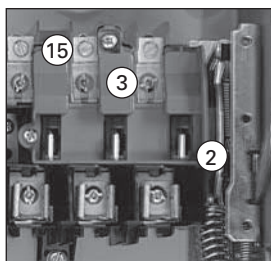
Breaker Frame	Non-Fused Switch	UL Listed Short Circuit Current Rating
NEG, NGB, ED4	30 DT (240V)	18 kA Thru 240 VAC
NEB, NEG, NGG, NGB, ED4	60-100A GD & DT (240V)	18 kA Thru 240 VAC
NEB, NEG, NGG, NGB, ED4	30-100A HD & DT (600V)	18 kA Thru 480 VAC
ED6	30-100A HD & DT (600V)	18 kA Thru 600 VAC
FD6-A, JD6-A	200A HD & DT (600V)	18 KA Thru 600 VAC
JD6-A, LD6-A	400A GD & DT (240V)	18 kA Thru 240 VAC
JD6-A, LD6-A	400A HD & DT (600V)	18 kA Thru 600 VAC
LD6-A	600A GD & DT (240V)	25kA Thru 240 VAC
LD6-A	600A HD & DT (600V)	25kA Thru 600 VAC
NNG	1200A HD & DT (600V)	25 kA Thru 600 VAC

① All switches above are rated at 10 KA when protected by any UL Listed CB
 ② Circuit breaker trip rating must not exceed switch ampere rating

Switches

Heavy Duty Safety Switches

Features



1. Quick-make, quick-break operating mechanism that ensures positive operation.
2. Visible blade, double-break switching action.
3. Arc chutes dissipate heat and prolong switch life.
4. Highly visible red handle grip. Designed for hook stick operation.
5. Defeatable dual cover interlock.
6. Center punch provided for field drilling to allow ON padlocking.
7. Handle can be padlocked in the OFF position with up to (3) padlocks with 5/16" hasps.
8. Generous top, bottom and side gutters that meet or exceed NEC wire-bending space requirements.
9. Informative door labeling which includes replacement parts list.
10. Tangential knockouts through 600A for easy conduit lineup.
11. Side-hinged door that opens past 180 degrees for easier wiring.
12. Unique enclosure design increases rigidity and prevents cuts and scrapes to conductors and installer's hands.
13. Spring reinforced fuse clips that assure reliable contact for cool operation.
14. Door latch securely holds door closed and allows cover padlocking.
15. Front removable mechanical lugs that are suitable for CU/Al 60 or 75° C conductors.
16. Lugs are field convertible to copper body and to a wide variety of compression connectors.
17. Hinged clear line terminal shield with probe holes for inspecting or testing line side terminals.
18. Embossed aluminum nameplate on Heavy Duty Switches provides highly visible ON/OFF indication.
19. Drawn cover for increased rigidity and resistance to abuse.
20. Top key hole and bottom mounting holes provide easy 2 or 3 point mounting.



System	Ampere Rating	Indoor — Type 1		Outdoor — Type 3R		Horsepower Rating ^①							
		Catalog Number	Ship Wt. (lbs.) Std. Pkg	Catalog Number	Ship Wt. (lbs.) Std. Pkg	240V AC				250 Volt DC			
						1-Phase, 2-Wire		2-Phase, 4-Wire				3-Phase, 3-Wire	
						Std.	Max.	Std.	Max.	Std.	Max.	Std.	

240 Volt Fusible^②

2-Pole, 2-Fuse, and Solid Neutral^③ (Also used for 2-Pole, 2-Wire Applications) 240 Volt AC/250 Volt DC

	30	HF221N	12	HF221NR	13	1½	3	—	—	3	7½	5
	60	HF222N	18	HF222NR	19	3	10	—	—	7½	15	10
	100	HF223N	23	HF223NR	24	7½	15	—	—	15	30	20
	200	HF224N	47	HF224NR	48	15	—	—	—	25	60	40
	400	HF225NA	91.1	HF225NRA	91.1	15	—	—	—	50	125	50
	600	HF226NA	95.6	HF226NRA	95.6	15	—	—	—	75	200	50
	800	HF227N	365	HF227NR	365	—	—	—	—	100	250	50
	1200	HF228N■	385	HF228NR■	385	—	—	—	—	100	250	50

3-Pole, 3-Fuse, and Solid Neutral (Also used for 3-Pole, 3-Wire Applications) 240 Volt AC/250 Volt DC

	30	HF321N	14	HF321NR	15	1½	3	—	—	3	7½	5
	60	HF322N	19	HF322NR	20	3	10	—	—	7½	15	10
	100	HF323N	25	HF323NR	26	7½	15	—	—	15	30	20
	200	HF324N	49	HF324NR	50	15	—	—	—	25	60	40
	400	HF325NA	94.6	HF325NRA	94.6	15	—	—	—	50	125	50
	600	HF326NA	99.6	HF326NRA	99.6	15	—	—	—	75	200	50
	800	HF327N	375	HF327NR	375	—	—	—	—	100	250	50
	1200	HF328N	395	HF328NR	388	—	—	—	—	100	250	50

240 Volt Fusible^②

2-Pole, 2-Fuse^④ 240 Volt AC/250 Volt DC

	Type 4/4X Stainless ^⑦		Type 12 Industrial ^⑧									
	30	HF221S	13	HF221J	13	1½	3	—	—	3	7½	5
	60	HF222S	19	HF222J	19	3	10	—	—	7½	15	10
	100	HF223S	24	HF223J	24	7½	15	—	—	15	30	20
	200	HF224S	48	HF224J	48	15	—	—	—	25	60	40

3-Pole, 3-Fuse^④ (Also used for 2-Pole, 2-Wire Applications in 400–800A Ratings) 240 Volt AC/250 Volt DC

	30	HF321S	14	HF321J	14	1½	3	—	—	3	7½	—
	60	HF322S	20	HF322J	20	3	10	—	—	7½	15	10
	100	HF323S	25	HF323J	25	7½	15	—	—	15	30	20
	200	HF324S	49	HF324J	49	15	—	—	—	25	60	40
	400	HF325SA	93	HF325JA	93	15	—	—	—	50	125	50
	600	HF326SA	98	HF326JA	98	15	—	—	—	75	200	50
	800	HF327S■	370	HF327J■	365	—	—	—	—	100	250	50

■ Built to order. Allow 3-5 weeks for delivery.

① Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

② Dual horsepower ratings: Std.- applies when non-time delay fuses are installed. Max.- applies when time-delay fuses are installed.

③ These switches are UL-listed for application on grounded B-phase systems and are suitable for 3-phase motor applications.

④ When a neutral is required use a field installed neutral kit.

⑤ Suitable for use as service entrance equipment.

⑥ Also rated Type 3S/3R.

⑦ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 18/9.

Switches

Heavy Duty Safety Switches

• Revised •
07/15/15

Selection



Svstem	Ampere Rating	Indoor — Type 1		Outdoor — Type 3R		Horsepower Rating ^④									
		Catalog Number	Ship Wt. (lbs.) Std. Pkg	Catalog Number	Ship Wt. (lbs.) Std. Pkg	480V AC				600V AC				250 Volt DC	600 Volt DC
						1-Phase, 2-Wire		3-Phase, 3-Wire		1-Phase, 2-Wire		3-Phase, 3-Wire			
						Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.		

600 Volt Fusible^⑤

2-Pole, 2-Fuse ^③		480 Volt AC/600 Volt AC/600 Volt DC													
	30	HF261	15	HF261R	15	3	7½	—	—	3	10	—	—	5	15
	60	HF262	20	HF262R	20	5	20	—	—	10	25	—	—	10	30
	100	HF263	26	HF263R	27	10	30	—	—	15	40	—	—	20	50

3-Pole, 3-Fuse

3-Pole, 3-Fuse		480 Volt AC/600 Volt AC/250 Volt DC ^①													
	30	HF361	14	HF361R	15	3	7½	5	15	3	10	7½	20	5	—
	30	HF361RL ^⑦	19	HF361RL ^⑦	20	3	7½	5	15	3	10	7½	20	5	—
	60	HF362	19	HF362R	20	5	20	15	30	10	25	15	50	10	30 ^⑧
	60	—	—	HF362RL ^⑦	25	5	20	15	30	10	25	15	50	10	30 ^⑧
	100	HF363	24	HF363R	25	5	20	25	60	15	40	30	75	20	50 ^⑧
	200	HF364	48	HF364R	49	25	50	50	125	30	50	60	150	40	50
	400	HF365A ^①	93	HF365RA ^①	157	—	—	100	250	—	—	125	350	50	—
	600	HF366A ^①	98	HF366RA ^①	161	—	—	150	400	—	—	200	500	50	—
	800	HF367	365	HF367R	365	—	—	200	500	—	—	250	500	50	—
	1200	HF368	383	HF368R	385	—	—	200	500	—	—	250	500	50	—

3-Pole, 3-Fuse and Solid Neutral

3-Pole, 3-Fuse and Solid Neutral		480 Volt AC/600 Volt AC/250 Volt DC ^①													
	30	HF361N	14	HF361NR	15	3	7½	5	15	3	10	7½	20	5	—
	60	HF362N	19	HF362NR	20	5	20	15	30	10	25	15	50	10	30 ^⑧
	100	HF363N	25	HF363NR	26	10	30	25	60	15	40	30	75	20	50 ^⑧
	200	HF364N	49	HF364NR	50	25	50	50	125	30	50	60	150	40	50
	400	HF365NA	94.6	HF365NRA	94.6	—	—	100	250	—	—	125	350	50	—
	600	HF366NA	99.6	HF366NRA	99.6	—	—	150	400	—	—	200	500	50	—
	800	HF367N	375	HF367NR	375	—	—	250	500	—	—	250	500	50	—
	1200	HF368N	395	HF368NR	388	—	—	250	500	—	—	250	500	50	—

600 Volt Fusible^⑤ (For 2-Pole Applications use outside poles of 3-Pole Switches)

2-Pole, 2-Fuse ^③		480 Volt AC/600 Volt AC/600 Volt DC													
	30	Type 4/4X Stainless ^⑥		Type 12 Industrial ^⑥		3	7½	—	—	3	10	—	—	5	15
	60	HF261S	15	HF261J■	15										
	100	HF262S	20	HF262J■	20										
	100	HF263S■	27	HF263J■	27	10	30	—	—	15	40	—	—	20	50

3-Pole, 3-Fuse

3-Pole, 3-Fuse		480 Volt AC/600 Volt AC/250 Volt DC ^①													
	30	HF361S	13	HF361J	14	—	—	5	15	—	—	7½	20	5	—
	60	HF362S	20	HF362J	20	—	—	15	30	—	—	15	50	10	30 ^⑧
	100	HF363S	25	HF363J	25	—	—	25	60	—	—	30	75	20	50 ^⑧
	200	HF364S	49	HF364J	49	—	—	50	125	—	—	60	150	40	50
	400	HF365SA ^①	93	HF365JA ^①	93	—	—	100	250	—	—	125	350	50	—
	600	HF366SA ^①	98	HF366JA ^①	98	—	—	150	400	—	—	200	500	50	—
	800	HF367S	370	HF367J■	365	—	—	200	500	—	—	250	500	50	—
	1200	HF368S■	388	HF368J■	388	—	—	250	500	—	—	250	500	50	—

■ Built to order. Allow 3-5 weeks for delivery.

① 60-600A 3-Pole switches are also rated 600V DC.

② Height reduced switch (45.25 rather than 56 inches in height) for use with 500MCM or smaller conductors.

③ Use 3-Pole switch for 200A applications.

④ Dual horsepower ratings: Std.- applies when non-time

delay fuses are installed. Max.- applies when time-delay fuses are installed.

⑤ Suitable for use as service entrance equipment except on 1200 Amp solidly grounded wye systems per NEC 230.95.

⑥ Also rated Type 3S/3R.

⑦ Indicates oversized enclosure (30A switch with 60A

lugs in a 60A enclosure or 60A switch with 100A lugs in a 100A enclosure).

⑧ 600V DC & 600V DC horsepower rating shown requires (2) poles to be connected in series.

⑨ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 18/9.



System	Ampere Rating	Indoor — Type 1		Outdoor — Type 3R		Horsepower Rating							
		Catalog Number	Ship Wt. (lbs.)	Catalog Number	Ship Wt. (lbs.)	240 Volt		480 Volt		600 Volt		250V	600V
						1-Phase	3-Phase	1-Phase	3-Phase	1-Phase	3-Phase	DC	DC

600 Volt Non-Fusible^④

2-Pole ^③						480 Volt AC / 600 Volt AC / 600 Volt DC							
	30	HNF261	12	HNF261R	13	—	—	7½	—	10	—	5	15
	60	HNF262	19	HNF262R	20	—	—	20	—	25	—	10	30
	100	HNF263	24	HNF263R	25	—	—	30	—	40	—	20	50

3-Pole						480 Volt AC / 600 Volt AC / 250 Volt DC							
	30	HNF361	12	HNF361R	13	5	10	7½	20	10	30	5	—
	30	—	—	HNF361RL ^⑥	19	5	10	7½	20	10	30	5	—
	60	HNF362H ^②	11	HNF362RH ^②	11	10	20	20	50	20	40	10	—
	60	HNF362 ^①	18	HNF362R ^①	19	10	20	20	50	25	60	10	30 ^②
	60	—	—	HNF362RL ^⑥	24	10	20	20	50	25	60	10	30 ^②
	100	HNF363 ^①	23	HNF363R ^①	24	15	40	30	75	40	100	20	50 ^②
	200	HNF364 ^①	46	HNF364R ^①	47	15	60	50	125	50	150	40	50
	400	HNF365A ^①	75	HNF365RA ^①	75	15	125	50	250	50	350	50	—
	600	HNF366A ^①	77	HNF366RA ^①	77	15	200	50	400	50	500	50	—
	800	HNF367	295	HNF367R	295	15	250	50	500	50	500	50	—
	1200	HNF368	305	HNF368R	307	15	250	50	500	50	500	50	—

600 Volt Non-Fusible^④

2-Pole ^③						480 Volt AC / 600 Volt AC / 600 Volt DC							
	30	Type 4 / 4X Stainless ^⑥		Type 12 Industrial ^⑥		—	—	7½	—	10	—	5	15
	60	HNF261S	13	HNF261J	13	—	—	20	—	25	—	10	30
	100	HNF262S	20	HNF262J	20	—	—	30	—	40	—	20	50

3-Pole						480 Volt AC / 600 Volt AC / 250 Volt DC							
	30	HNF361S	13	HNF361J	13	5	10	7½	20	10	30	5	—
	60	HNF362SH ^②	15	HNF362JH ^②	14	10	20	20	50	20	40	10	—
	60	HNF362S ^①	19	HNF362J ^①	19	10	20	20	50	25	60	10	30 ^②
	100	HNF363S ^①	24	HNF363J ^①	24	15	40	30	75	40	100	20	50 ^②
	200	HNF364S ^①	47	HNF364J ^①	47	15	60	50	125	50	150	40	50
	400	HNF365SA ^①	75	HNF365JA ^①	75	15	125	50	250	50	350	50	—
	600	HNF366SA ^①	77	HNF366JA ^①	77	15	200	50	400	50	500	50	—
	800	HNF367S	295	HNF367J	295	15	250	50	500	50	500	50	—
	1200	HNF368S	310	HNF368J	310	15	250	50	500	50	500	50	—

■ Built to order. Allow 3-5 weeks for delivery.

① 60-600A 3-Pole switches are also rated 600V DC.

② Compact switch (11.1"H, 6.6"W box less cover and handle).

Short circuit withstand rating—100,000 RMS sym. amps.

③ Use 3-Pole switch for 200A application.

④ Suitable for use as service entrance equipment except for 1200 when used on a 480 or 600V grounded wye system.

⑤ Also rated type 3S / 3R.

⑥ Indicates oversized enclosure (30A switch in a 60A enclosure or a 60A switch in a 100A enclosure).

⑦ 600V DC and 600V DC horsepower rating shown requires (2) poles to be connected in series.

⑧ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 18/9.

Switches

Heavy Duty Safety Switches

• Revised •
07/15/15

Type 3R, 4/4X, & 12 with Viewing Window

Description







30–600A, 3-pole 600V max. in fusible and non-fusible versions in Type 4/4X stainless steel and Type 12 enclosures.

All allow viewing of visible blade position. 30–200A also allow viewing of indicating type fuses.

Features

- Rugged installer-friendly enclosure design features a gasket flange with continuously welded seams
- Tool-free cover latches
- Two, three and four point mounting
- Metal handle with large insulating grip features a positive stop in both ON and OFF position
- Ground lugs provided as standard
- Type 12 enclosures are fabricated from galvanized steel and are also rated for 3R/3S outdoor applications
- Type 4X stainless steel switches (30–200A) are provided with stainless steel interior parts
- The widest range of accessories available including 200% neutrals, gold plated PLC auxiliary contacts and isolated ground kits



System	Ampere Rating	Catalog Number	Ship Wt. (lbs.)	Maximum Horsepower Rating ^②					
				240V AC		480V AC	600V AC	250V DC	600V DC
				1-Phase, 2-Wire	3-Phase, 3-Wire	3-Phase, 3-Wire	3-Phase, 3-Wire		
3-Pole, 3-Wire Fusible, Type 3R ^④				600 Volt AC / 250 Volt DC ^①					
	30	HF361RW	17	3	7½	15	20	5	—
	60	HF362RW	22	10	15	30	50	10	30 ^⑤
3-Pole, 3-Wire Non-Fusible, Type 3R ^④				600 Volt AC / 250 Volt DC ^①					
	30	HNF361RW	14	3	10	20	30	5	—
	60	HNF362RW	21	10	20	50	60	10	30 ^⑤
3-Pole, 3-Wire Fusible, Type 12 ^{③④}				600 Volt AC / 250 Volt DC ^①					
	30	HF361JW	17	3	7½	15	20	5	—
	60	HF362JW	22	10	15	30	50	10	30 ^⑤
	100	HF363JW	26	15	30	60	75	20	50 ^⑤
	200	HF364JW	53	—	60	125	150	40	50
	400	HF365JWA	93	—	125	250	350	50	—
	600	HF366JWA	98	—	200	400	500	50	—
3-Pole, 3-Wire Non-Fusible, Type 12 ^{③④}				600 Volt AC / 250 Volt DC ^①					
	30	HNF361JW	14	3	10	20	30	5	—
	60	HNF362JW	21	10	20	50	60	10	30 ^⑤
	100	HNF363JW	25	15	40	75	100	20	50 ^⑤
	200	HNF364JW	51	15	60	125	150	40	50
	400	HNF365JWA	75	15	125	250	350	50	—
3-Pole, 3-Wire Fusible, Type 4X Stainless Steel ^{④⑥}				600 Volt AC / 250 Volt DC ^①					
	30	HF361SW	17	3	7½	15	20	5	—
	60	HF362SW	23	10	15	30	50	10	30 ^⑤
	100	HF363SW	28	15	30	60	75	20	50 ^⑤
	200	HF364SW	55	—	60	125	150	40	50
	400	HF365SWA	75	15	125	250	350	50	—
3-Pole, 3-Wire Non-Fusible, Type 4X Stainless Steel ^{④⑥}				600 Volt AC / 250 Volt DC ^①					
	30	HNF361SW	15	3	10	20	30	5	—
	60	HNF362SW	23	10	20	50	60	10	30 ^⑤
	100	HNF363SW	27	15	40	75	100	20	50 ^⑤
	200	HNF364SW	54	15	60	125	150	40	50
	400	HNF365SWA	75	15	125	250	350	50	—

① 200A switches are also rated 600V DC.

② Maximum HP ratings listed apply only when time delay fuses are used.

③ Also rated 3S/3R for outdoor use.

④ All switches are suitable for use as service entrance equipment. Use outside poles of 3-pole switch for 2-pole application.

⑤ 600V DC and 600V DC horsepower rating shown requires (2) poles to be connected in series.

⑥ 304 grade stainless steel. For switches with enclosures constructed from 316 grade stainless steel, see page 18/9.

Switches

Heavy Duty Safety Switches

Type VBII 4 & 6 Pole Heavy Duty Safety Switches

Application

4 & 6-pole switches are commonly used as a disconnecting means for two-speed, two-winding motors. Fused switches provide both over current and short circuit protection. Non-fusible switches normally provide a local disconnection means for two-speed motors which are remote from their motor controller. 4-pole switches are also used in 3-phase, 4-wire circuits when a switching neutral is required. All 4 & 6-pole switches are service entrance rated.

Description

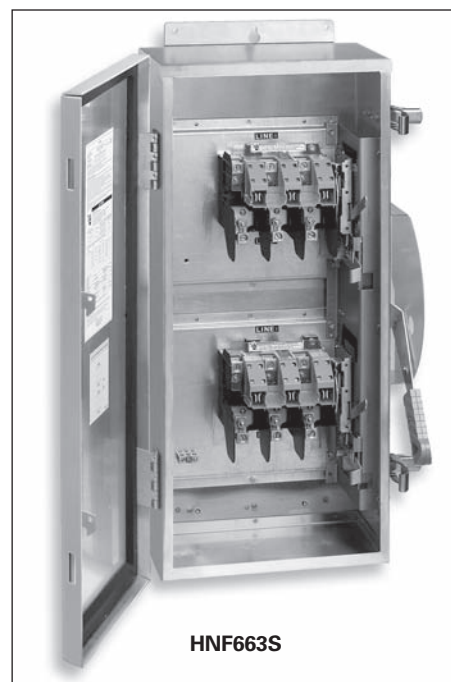
4 & 6-pole switches are available in 30-200A ratings and in both fusible and non-fusible versions. 4-pole switches are supplied with either Type 1 or Type 12/3R enclosures. 6-pole switches are available with either Type 12/3R or Type 4X stainless steel enclosures.

Standards

- UL & CUL listed under file #E4776
- Meets UL98 for enclosed switches
- 4 & 6-Pole switches are suitable for use as service entrance
- Meets NEMA Standard KS-1 for enclosed switches
- Meets NEC wire bending space requirements

Features

- Visible blade, double break switching action
- Highly visible ON/OFF indication
- Defeatable dual cover interlock
- Padlock option in OFF position
- All copper current carrying parts^①
- Tangenital knockouts (Type 1, 4-pole switches)



HNF663S

4-Pole Type VBII Switches^{①②}

System	Amp Rating	Indoor Type 1		Type 12/3R Industrial ^⑤		Horsepower Ratings ^③								
		Catalog Number	Ship Wt. (lbs.)	Catalog Number	Ship Wt. (lbs.)	240V, 20, 4W		240V 3Ø		480V, 3Ø		600V, 3Ø		250V DC
						Std.	Max.	Std.	Max.	Std.	Max.	Std.	Max.	

Fusible 600 Volt AC, 250 Volt DC — 4-Pole, 4 Fuse^④

	30	HF461	36	HF461J	36	3	10	3	7½	5	15	7½	20	5
	60	HF462	40	HF462J	40	7½	20	7½	15	15	30	15	50	10
	100	HF463	43	HF463J	43	15	30	15	30	25	60	30	75	20
	200	HF464	88	HF464J	88	25	50	25	60	50	125	60	150	40

Non-fusible 600 Volt AC, 250 Volt DC — 4-Pole

	30	HNF461	32	HNF461J	32	—	10	—	10	—	20	—	30	5
	60	HNF462	34	HNF462J	34	—	20	—	20	—	50	—	60	10
	100	HNF463	36	HNF463J	36	—	30	—	40	—	75	—	100	20
	200	HNF464	78	HNF464J	78	—	50	—	60	—	125	—	150	4

6-Pole Type VBII Switches^{①②⑤}

System	Amp Rating	Type 12/3R Industrial		Type 4X Stainless Steel		Horsepower Ratings ^③							
		Catalog Number	Ship Wt. (lbs.)	Catalog Number	Ship Wt. (lbs.)	240V 3Ø		480V, 3Ø		600V, 3Ø		250V DC	
						Std.	Max.	Std.	Max.	Std.	Max.		

Fusible 600 Volt AC, 250 Volt DC — 6-Pole, 6 Fuse^④

	30	HF661J	37	HF661S	37	3	7½	5	15	7½	20	5
	60	HF662J	41	HF662S	41	7½	15	15	30	15	50	10
	100	HF663J	44	HF663S	44	15	30	25	60	30	75	20
	200	HF664J	90	HF664S	90	25	60	50	125	60	150	40

Non-fusible 600 Volt AC, 250 Volt DC — 6-Pole

	30	HNF661J	33	HNF661S	33	—	10	—	20	—	30	5
	60	HNF662J	35	HNF662S	35	—	20	—	50	—	60	10
	100	HNF663J	37	HNF663S	37	—	40	—	75	—	100	20
	200	HNF664J	80	HNF664S	80	—	60	—	125	—	150	40

■ Built to order. Allow 3-5 weeks for delivery.

① Lugs are aluminum alloy as standard. Optional copper body lugs are available.

② All 4 & 6-pole VBII switches are suitable for use as service equipment when a neutral is installed or equipment ground kit is properly connected.

③ Dual horsepower ratings: Std. — applies when non-time-delay fuses are installed. Max. — applies when time delay fuses are installed.

④ Fusible switches accept Class H Fuses as the standard. Class R & J fuses can also be installed and increase the rating from 10,000 to 200,000 AIC. For

Class J, the load base is moved upward. For Class R fuses, rejection kits are required.

⑤ Supplied with factory installed ground lugs.

Switches

Heavy Duty Safety Switches

Special Application Switches / Interlocked Receptacle Switches

Application

Receptacle Safety Switches provide cord connection protection of heavy-duty portable equipment (welders, infrared ovens, batch feeders, portable conveyors, assembly line fixtures and tools, refrigerator trucks, etc.) under load or fault conditions.

Standards

All receptacle switches are UL listed under file #E4776. Those with a viewing window are also CSA certified under file #1079316.

Description^{①②}

Type 12 and 4/4X Receptacle Safety Switches are available with 3-phase, 4-wire grounded type Crouse-Hinds Arkite™ 2 or Pyle-National receptacle, pre-wired and mounted with interlock linkage to the switch mechanism. Insertion or removal of the plug is prevented by the interlock linkage while the switch is in the "ON" position. Receptacle prevents operation of switch if incorrect plug is inserted.



Crouse-Hinds Interlocked Receptacle Switches

Ampere Rating ^④	Type 12 ^⑤	Type 4/4X ^⑥	Shipping Wt. (lbs.) Std. Pkg.	Accepts Crouse-Hinds Arkite [®] Plug Catalog Number
	Catalog Number	Catalog Number		

240V Fusible, 3-Pole, 3-Wire

30	HF321JCH	HF321SCH▲	23	APJ3485 & NPJ3485
60	HF322JCH	HF322SCH▲	30	APJ6485 & NPJ6485
100	HF323JCH	HF323SCH▲	36	APJ10487 & NPJ10487

600V Fusible, 3-Pole, 3-Wire

30	HF361JCH	HF361SCH	24	APJ3485 & NPJ3485
60	HF362JCH	HF362SCH	30	APJ6485 & NPJ6485
100	HF363JCH	HF363SCH▲	36	APJ10487 & NPJ10487

600V Non-Fusible, 3-Pole, 3-Wire

30	HNF361JCH▲	HNF361SCH▲	22	APJ3485 & NPJ3485
60	HNF362JCH	HNF362SCH	29	APJ6485 & NPJ6485
100	HNF363JCH▲	HNF363SCH▲	35	APJ10487 & NPJ10487

600V Fusible, 3-Pole, 3-Wire with Viewing Window

30	HF361JCHW▲	HF361SCHW▲	24	APJ3485 & NPJ3485
60	HF362JCHW	HF362SCHW	30	APJ6485 & NPJ6485
100	HF363JCHW▲	HF363SCHW▲	36	APJ10487 & NPJ10487

600V Non-Fusible, 3-Pole, 3-Wire with Viewing Window

30	HNF361JCHW▲	HNF361SCHW▲	22	APJ3485 & NPJ3485
60	HNF362JCHW	HNF362SCHW▲	29	APJ6485 & NPJ6485
100	HNF363JCHW▲	HNF363SCHW▲	35	APJ10487 & NPJ10487

Pyle-National Interlocked Receptacle Switches 3-Poles Fusible and Non-Fusible

Ampere Rating		Voltage Rating	Type 12 Catalog Number ^⑤	Type 12 Stainless Steel Catalog Number ^⑥	Shipping Wt. (lbs.) Std. Pkg.	Accepts Pyle-National QuelArc™ ^{②③} Plugs Plug Catalog Number
Switch	Receptacle					
30	30	600 (F) 600 (N-F)	HF361JPN▲ HNF361JPN	HF361SPN▲ HNF361SPN	23 21	JPD-83046
60	60	240 (F) 600 (F) 600 (N-F)	HF322JPN▲ HF362JPN▲ HNF362JPN	— HF362SPN▲ HNF362SPN	28 28 27	JPD-116046

▲ Built to order. Allow 6-8 weeks for delivery.

① Arkite™ is a registered trademark of the Crouse-Hinds Company. Plugs are not sold or supplied by Siemens.

② Indicates plug with maximum diameter cable bushing.

③ QuelArc™ is a registered trademark of the Pyle-National Company.

④ Ampere rating of both switch and receptacle.

⑤ Also rated Type 3R/3S.

⑥ Enclosure is constructed of Type 304 stainless steel.

Switches

Heavy Duty Safety Switches

Special Application Safety Switches / Type VBII Non-Metallic & 316 Grade Stainless Steel

Application

Siemens Non-metallic and 316 grade stainless steel switches provide a superior level of corrosion resistance to assure trouble free performance in the most severe conditions. 316 grade stainless steel provides increased corrosion resistance when compared to 304 grade, especially in atmospheres containing a high level of chlorine commonly encountered in marine and waste management applications. Our non-metallic enclosures are constructed from fiberglass reinforced polyester and are extremely resistant to a wide range

of corrosive atmospheres. They allow a wide range of operating temperatures and their insulating properties virtually eliminate problems caused by internal condensation.

Description

30-200A, 600V Max, fusible and non-fusible switches are available in both non-metallic and 316 grade stainless steel versions. All are supplied with factory installed ground bars as standard. Viewing windows are also available in the stainless offering.



Type 4/4X Non-Metallic

Ampere Rating	Catalog Number	Ship Weight Std. pkg. (lbs.)	Horsepower Rating—3-Phase						250 Volts DC	600 Volts DC	
			240 Volt AC		480 Volt AC		600 Volt AC				
			Std.	Max.	Std.	Max.	Std.	Max.			
3-Pole, 4-Wire, 240 Volt Fusible, Type 4X ^⑤											
30	HF321NX	21	3	7½	—	—	—	—	5	—	
60	HF322NX▲	22	7½	15	—	—	—	—	10	—	
3-Pole, 4-Wire, 600 Volt AC Fusible, Type 4X ^{②③⑤}											
30	HF361NX	21	3	7½	5	15	7½	20	5	15 ^④	
60	HF362NX	22	7½	15	15	30	15	50	10	30 ^④	
100	HF363NX▲ ^①	39	15	30	25	60	30	75	20	50 ^④	
200	HF364NX▲ ^①	83	25	60	50	125	60	150	40	50	
3-Pole, 3-Wire, 600 AC Volt Non-Fusible, ^① Type 4X ^{②③}											
30	HNF361X	20	—	7½	—	20	—	30	5	15 ^④	
60	HNF362X	20	—	15	—	50	—	60	10	30 ^④	
100	HNF363X▲	38	—	30	—	75	—	100	20	50 ^④	
200	HNF364X▲	81	—	60	—	125	—	150	40	50	

Type 4/4X 316 Grade Stainless Steel

Ampere Rating	Standard	With Viewing Window	Ship Weight (lbs.)	Horsepower Rating—3-Phase						250 Volts DC	600 Volts DC
	Catalog Number	Catalog Number		240 Volt AC		480 Volt AC		600 Volt AC			
				Std.	Max.	Std.	Max.	Std.	Max.		
240V AC, 250V DC Fusible 3-Pole, 3-Wire											
30	HF321SS▲	—	15	3	7½	—	—	—	—	5	—
60	HF322SS▲	—	19	7½	15	—	—	—	—	10	—
100	HF323SS▲	—	27	15	30	—	—	—	—	20	—
200	HF324SS▲	—	48	25	60	—	—	—	—	40	—
600V AC, 250V DC Fusible 3-Pole, 3-Wire ^③											
30	HF361SS	HF361SSW	17	3	7½	5	15	7½	20	5	—
60	HF362SS	HF362SSW▲	21	7½	15	10	30	15	50	10	30 ^④
100	HF363SS	HF363SSW▲	28	15	30	25	60	30	75	20	50 ^④
200	HF364SS	HF364SSW▲	54	25	60	50	125	60	150	40	50
600V AC, 250 V DC Non-Fusible 3-Pole, 3-Wire ^{①③}											
30	HNF361SS	HNF361SSW	15	—	10	—	20	—	30	5	—
60	HNF362SS	HNF362SSW▲	21	—	20	—	50	—	60	10	30 ^④
100	HNF363SS	HNF363SSW▲	26	—	40	—	75	—	100	20	50 ^④
200	HNF364SS	HNF364SSW▲	51	—	60	—	125	—	150	40	50

▲ Built to order. Allow 6-8 weeks for delivery.

① Also used for 240 volt applications.

③ Add "L" to end of catalog number for switches less line & load lugs with mounting hardware for crimp type or copper body lugs.

③ 200A switches are also rated 600V DC max.

④ 600V DC voltage and horsepower rating shown requires (2) poles to be connected in series.

⑤ Supplied with factory installed neutral.

Switches

Heavy Duty Safety Switches

Enclosed Solar Photovoltaic (PV) Switches

• Revised •
04/30/15

Application

Solar disconnect switches are designed to be used in the DC portion of photovoltaic power generation circuits. They incorporate powerful magnets within the switch line base which work in combination with a double break switching action to quickly dissipate the very hot arc that is generated when a 600V DC circuit is opened under load. These circuits are defined by article 690 of the NEC which requires the grounded conductor to be at ground potential at all times and therefore cannot be switched.

Description

30-200A switches are available in both Type 1 and 3R enclosures and in both fusible and non-fusible versions. They are provided with an additional door mounted warning label as required by the NEC and are supplied with a factory installed equipment ground bar. They are built to UL98 requirements but are UL listed in file number E335018 as UL1741 photovoltaic disconnect switches. They are 3 pole switches that are approved to switch 3 separate 600V DC circuits (one per pole). The design incorporates

many of the standard VBI switch features including a rolled out enclosure front flange, a large metal operating handle, oversized line and load lugs and large wire gutters. 1000VDC photovoltaic switches are UL98B listed for solar applications and comply with article 690 of the NEC. The new 400-600Amp switches are also UL98B listed at 600VDC and come in NEMA Type 3R.

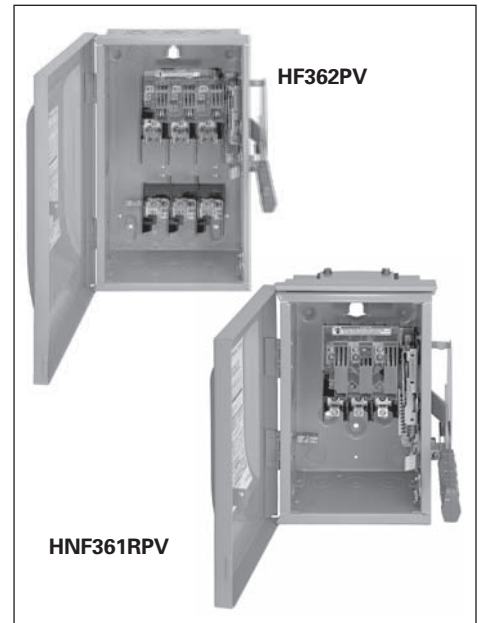
Solar Photovoltaic Enclosed Disconnect Switches

Ampere Rating	Indoor – Type 1		Outdoor – Type 3R		Rated Isc Per NEC Article 690
	Catalog Number	Ship Wt* Std. Pkg.	Catalog Number	Ship Wt* Std. Pkg.	
Negative Ground 3 Pole 3 Wire Fusible 600Volt DC					
30	HF361PV	14	HF361RPV	15	19.2 A
60	HF362PV	20	HF362RPV	21	38.4 A
100	HF363PV▲	25	HF363RPV	26	64.0 A
200	HF364PV▲	49	HF364RPV	50	128.0 A
Negative Ground 3 Pole 3 Wire Non-Fusible 600Volt DC					
30	HNF361PV	12	HNF361RPV	13	24.0 A
60	HNF362PV	19	HNF362RPV	20	48.0 A
100	HNF363PV▲	24	HNF363RPV	25	80.0 A
200	HNF364PV▲	47	HNF364RPV	48	160.0 A
NEW Positive and Negative Ground, 1 Pole, Fusible 1000 Volt DC					
200	HF1104NPV▲	52	HF1104NRPV▲	53	128.0A
NEW Positive and Negative Ground, 1 Pole, Non-Fusible 1000 Volt DC					
200	HNF1104NPV▲	50	HNF1104NRPV▲	51	160.0A
Positive Ground 3 Pole 3 Wire Fusible 600Volt DC					
30	HF361PVPG	14	HF361RPVPG	15	19.2 A
60	HF362PVPG▲	20	HF362RPVPG	21	38.4 A
100	HF363PVPG▲	25	HF363RPVPG▲	26	64.0 A
200	HF364PVPG▲	49	HF364RPVPG▲	50	128.0 A
Positive Ground 3 Pole 3 Wire Non-Fusible 600Volt DC					
30	HNF361PVPG	12	HNF361RPVPG	13	24.0 A
60	HNF362PVPG▲	19	HNF362RPVPG	20	48.0 A
100	HNF363PVPG▲	24	HNF363RPVPG▲	25	80.0 A
200	HNF364PVPG▲	47	HNF364RPVPG▲	48	160.0 A
NEW Positive and Negative Ground, 2 Wire, 600Volt DC, Type 3R					
Amperage Rating	No. Poles	Fuse Type	Catalog Number	Ship Wt* Std. Pkg	Rated Isc Per NEC Article 690
400A	1	Fusible	HF165NRPV▲	165	256A
400A	1	Non-fusible	HNF165NRPV▲	127	256A
400A	2	Fusible	HF265NRPV▲	325	256A
400A	2	Non-fusible	HNF265NRPV▲	315	256A
600A	1	Fusible	HF166NRPV▲	167	384A
600A	1	Non-fusible	HNF166NRPV▲	129	384A
600A	2	Fusible	HF266NRPV▲	327	384A
600A	2	Non-fusible	HNF266NRPV▲	315	384A

▲ Built to order. Allow 6-8 weeks for delivery.

* In pounds (lbs)

Note: All disconnects are rated at 10,000 AIC per UL requirements when used with or protected by Class K, J or R fuses rated at 600VDC.





HR612

Class R Fuse Clip Kits

All General Duty and Heavy Duty Switches are field convertible to accept Class R Fuse Clip Kits. The kits prevent the installation of Class H and K fuses (one kit required per 3-pole switch).

Class R Fuse Clip Kits

Catalog Number	Description
GSRK321	30A, 240V Kit (GD only)
HR21	30A, 240V Kit (HD only)
HR612	30A, 600V Kit/60A, 240V Kit
HR62	60A, 600V Kit
HR63	100A Kit
HR64	200A Kit
HR65A	400A Kit
HR66A	600A Kit

Class J Fusing

All 30-600A, 600V and 100-600A, 240V fusible Heavy Duty Switches are field convertible to accept Class J fuses by moving the load base to a pre-drilled J fuse position. All 100-600A, 240V fusible General Duty switches can also be field converted to accept Class J fuses.

Class J Fuse Kits

Catalog Number	Description
HJ66A	600A, 240V/600V Kit

Internal Shield Kits (for fusible switches)

Kits provide a clear plastic inner door to prevent accidental contact with live parts. Test probe holes are provided and fuses can be replaced without removal of kit.

NEW Internal Shield Kits ②

Switch Ampere Rating	Kit Catalog Number
30A HD	HSK61SSW
60A HD	HSK62SSW
100A HD	HSK63SSW
200A HD	HSK64SSW

▲ Built to order. Allow 6-8 weeks for delivery.

② One kit per pole required.

Siemens Industry, Inc.
Industrial Controls Catalog



HT63

Class T Fuse Adapter Kits

All 100-600A, General Duty and 100-200Amp and 1200Amp Heavy Duty Switches are field convertible to accept Class T fuses. 800A switches are field convertible to accept Class T fuses by moving the load base to a pre-drilled T fuse position.

Class T Fuse Adapter Kits①

Catalog Number	Description
HT23	100A, 240V Kit
HT63	100A, 600V Kit
HT24	200A, 240V Kit
HT64▲	200A, 600V Kit
HT25A	400A, 240V Kit
HT65A	400A, 600V Kit
HT26A	600A, 240V Kit
HT66A	600A, 600V Kit
TFAK82	1200A, 240V Kit

Neutral Kits

Standard Neutral Kits can be field installed in General and Heavy Duty Switches.

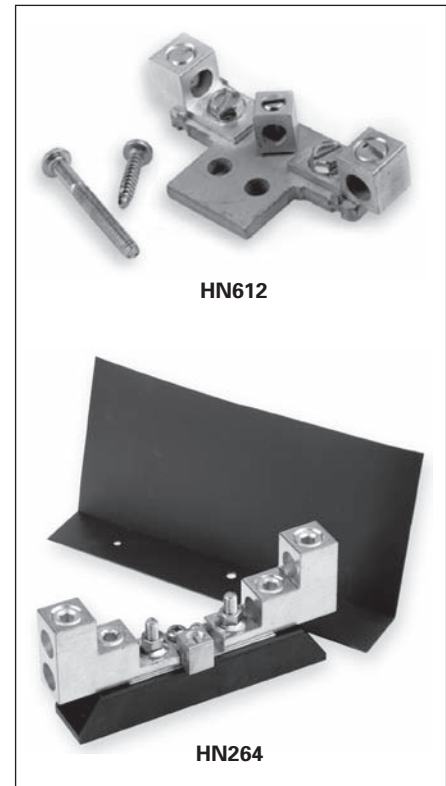
Neutral Kits

Switch Ampere Rating	Kit Catalog Number
30 GD	W410190
30 HD, 60 GD	HN612
60, 100 HD, 100 GD	HN623
200	HN64
400 & 600	HN656A
800 & 1200	HN678



HP61

① Not designed for use in Non-metallic 4X safety switches. Not designed for use with Auxiliary Contacts.



HN612

HN264

200% Neutral Kits

UL listed 200% Neutrals are available on 100-600A Heavy Duty Switches. They are typically used with non-linear transformers or where increased neutral ampacity/lug capacity is required.

200% Neutral Kits

Switch Ampere Rating	Kit Catalog Number	Wire Range Line & Load Lugs (Cu/Al)
100	HN263	(2) #14-1/0 AWG
200	HN264	(2) #6 AWG-300 Kcmil
400	HN656A	(2) 1/0 AWG-600 Kcmil (2) #6 AWG-300 Kcmil
600	HN678A	(2) 1/0 AWG-600 Kcmil (2) #6 AWG-300 Kcmil

Fuse Puller Kits

Fuse Puller Kits are field installable in 30-100A Type VBII Heavy Duty Switches (one kit required per 3-pole switch).

Fuse Puller Kits

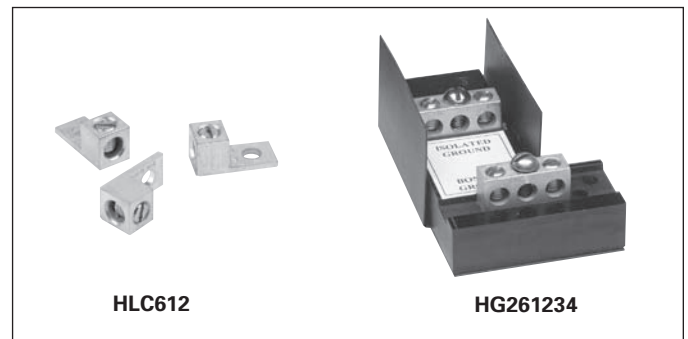
Switch Ampere Rating	Fuse Puller Kit Catalog Number
30	HP61
60	HP62▲
100	HP63▲

Switches

Heavy Duty Safety Switches

• Revised •
07/15/15

Accessories



Auxiliary Contacts

Auxiliary Contacts are available only for Heavy Duty Switches. The auxiliary contacts are available in 1 normally open and 1 normally closed or 2 normally open and 2 normally closed configurations. Siemens offers a PLC Auxiliary Switch (30-200A) that has very low resistance for low voltage and current typical in PLC circuits. All auxiliary contacts make after and break before main switch contacts.

Auxiliary Contacts

Switch Ampere	Aux. Switch Catalog Number	Kit Ampere Rating			Horsepower Rating	
		125V AC Max.	250V AC Max.	28V DC Max.	125V AC Max.	250V AC Max.

With 1 NO & 1 NC Isolated Contacts

30-600	HA161234	10	10	7	1/2	3/4
800-1200	HA165678	10	10	—	1/2	3/4

With 2 NO & 2 NC Isolated Contacts

30-600	HA261234	10	10	7	1/2	3/4
800-1200	HA265678	10	10	7	1/2	3/4

Low Current PLC Type with 1 NO & 1 NC Gold Plated Contacts

30-600	HA361234	10	10	7	1/2	3/4
800-1200	HA365678	10	10	—	1/2	3/4

Copper Lug Kits

Heavy duty switches are UL approved to accept field installed copper lug kits.

Copper Lug Kits

Switch Ampere Rating	Copper Lug Catalog Number	Description
30-60	HLC612	(9) Lugs/Kit #14-4 AWG Cu
100	HLC63▲	(9) Lugs/Kit #14-1/0 AWG Cu
200	HLC64▲	(9) Lugs/Kit #6 AWG-300 Kcmil Cu
400-600	HCU656A■	(1) Lugs/Kit #1/0 AWG-600 Kcmil Cu
800-1200	HLC65678	(1) Lugs/Kit #1/0 AWG-600 Kcmil Cu

▲ Built to order. Allow 6-8 weeks for delivery.

■ Purchase field replacement kit along with lugs.

NEW Quick Connects

They provide two point control power take-off capability and are normally used on two poles on the line side when it is required to have control power available when the switch is in the OFF position. They provide a mounting provision for standard 1/4" quick connect terminal. Installed in the line or load side. 30A VBII switches have lugs UL listed to accept (2) wires per pole as standard so a 30A kit is not required.

Quick Connects

Catalog Number	Description
HCQ62	60A 2 wire quick connect kit
HCQ63	100A 2 wire quick connect kit
HCQ64	200A 2 wire quick connect kit

Isolated Ground Kits

Isolated Ground Kits are available on 30-600A Heavy Duty Switches. They are normally used on circuits with a high content of computer or other electronic loading which require a ground which is isolated from the building ground and neutral circuits. The kit includes both isolated and grounded terminals as listed below.

Isolated Ground Kits

Switch Ampere Rating	Catalog Number	Number of Terminals		Wire Range Per Terminal (Cu/Al)
		Isolated	Grounded	
30-200	HG261234	2	2	#14-4 AWG
400-600	HG2656A	4	4	2/0-14 AWG 2/0-6 AWG

Equipment Ground Kits

Equipment Ground Lug Kits are available for all General and Heavy Duty Switches. They are field installable in Type 1 and Type 3R Switches and are factory installed as standard in Type 4 / 4X and Type 12 and also in all VBII 4&6-pole Switches.

Equipment Ground Kits

Switch Ampere Rating	Catalog Number	Number of Terminals	Wire Range Per Terminal (Cu/Al)
30A GD	GSGK60	2	#14-8 AWG
60-200 GD	HG61234	2	#14-4 AWG
30-200 HD	HG61234	2	#14-4 AWG
400 & 600	HG656A	4	2/0-6 AWG
800-1200	HG678	8	#6 AWG-250 Kcmil

Interchangeable Hubs

Conduit hubs are available for Type 3R, 12 and 4 / 4X applications. 30-200A Type 3R Switches are provided with a conduit hub provision and a removable hub plate on their top rainshed.

Conduit Size (inches)	Catalog Number	Used On
-----------------------	----------------	---------

Type 3R^①

Cover 3/4	ECHA000	30A GD Only
1	ECHA075	
1 1/4	ECHA100	
1 1/4	ECHA125	
Cover 3/4	ECHS000	60-200A GD 30-200A HD
1	ECHS075	
1 1/4	ECHS100	
1 1/4	ECHS125	
1 1/2	ECHS150	
2	ECHS200	
2 1/2	ECHS250	400-1200A
2 1/2	ECHV250	
3	ECHV300	
3 1/2	ECHV350	
4	ECHV400	

Type 4/4X^②

3/4	SSH075	30-200A
1	SSH100	
1 1/4	SSH125	
1 1/2	SSH150	
2	SSH200	
2 1/2	SSH250	400-600A
3	SSH300	
3 1/2	SSH350	
4	SSH400	

Note: 30 thru 200A. Type 3R Switches have removable hub plates on rainshed. 400A and larger Type 3R Switches have no provisions for mounting hubs. Drill or punch hole in the field to accommodate hub size desired.

Field Replacement Kits and Neutral Barrier Kits

All Heavy Duty Switches are field convertible for (Crimp) type lugs. When compression lugs are required for 30-100A switches, a neutral barrier kit is required for 1-Phase, 3W or 3-Phase, 4W applications. When compression lugs are required on 400-1200A switches, lug mounting kits are required.

Field Replacement Kits and Neutral Barrier Kits

Switch Ampere Rating	Catalog Number	Kit Description
30	HCL612	Neutral Barrier Kit
60 & 100	HCL623	Neutral Barrier Kit
400	HCM65A	240V/600V Fusible Kit
400	HNCM65A	240/600V Non-Fusible Kit
600	HCM66A	240V/600V Fusible Kit
600	HNCM66A	240V/600V Non-Fusible Kit
800 & 1200 ^③	HCL65678■	1 Pole, Compression Lug Mounting Kit

Lugs

30 & 60A Switches are suitable for use with 60° or 75°C wire. 100-1200A are suitable for use with 75°C rated wire.

Multiple Padlock Accessory

A tamper-proof device to provide for multiple padlocking to meet OSHA or plant requirements. Accepts up to 6 1/4" padlocks. Catalog number **SL0420**. Standard Carton-12.

Wire Ranges (Line, Load and Standard Neutral)

Switch Ampere Rating	Wire Range with Wire Bending Space Per NEC Requirements	Lug Wire Range
30GD	#14-8 AWG (Cu/Al) ^④	#14-6 AWG (Cu/Al)
30HD	#14-6 AWG (Cu/Al)	#14-2 AWG (Cu/Al)
60 ^{⑤⑥}	#14-3 AWG (Cu/Al)	#14-2 AWG (Cu/Al)
100 ^⑦	#14-1/0 AWG (Cu/Al)	#14-1/0 AWG (Cu/Al)
200 ^⑧	#6 AWG-250 Kcmil (Cu/Al)	#6 AWG-300 Kcmil (Cu/Al)
400 ^⑨	(1) 1/0 AWG-600 Kcmil (Cu/Al) (2) 1/0 AWG-500 Kcmil (Cu/Al)	(2) 1/0 AWG-600 Kcmil (Cu/Al)
600 ^⑩	(1) 1/0 AWG-600 Kcmil (Cu/Al) (2) 1/0 AWG-500 Kcmil (Cu/Al)	(2) 1/0 AWG-600 Kcmil (Cu/Al)
800	(3) 1/0 AWG-750 Kcmil (Cu/Al) Line Load (4) 1/0 AWG-750 Kcmil (Cu/Al) neutral	(3) 1/0 AWG-750 Kcmil (Cu/Al) Line Load (4) 1/0 AWG-750 Kcmil (Cu/Al) neutral
1200	(4) 3/0 AWG-750 Kcmil (Cu/Al) Line Load (4) 1/0 AWG-750 Kcmil (Cu/Al) neutral	(4) 1/0 AWG-750 Kcmil (Cu/Al) Line Load (4) 1/0 AWG-750 Kcmil (Cu/Al) neutral



SSH150



ECHV300



ECHS200



SL0420

■ Built to order. Allow 3-4 weeks for delivery.

- ① Hubs suitable for 3R Switches.
- ② Also suitable for Type 12 applications.
- ③ Neutral Barrier kits are required on 30-100A switches only and only with 1-Phase / 3W or 3-Phase / 4W loads. Compression Lugs mounting kits are required on 400-1200A switches only.
- ④ Provides mounting for a single line or load lug.
- ⑤ Provides mounting for (2) compression lugs per phase on line or load.
- ⑥ Line base lugs (only) are UL approved to accept #14-6 Cu/Al cable.
- ⑦ Max. wire size for height reduced switches is 500 kcmil (Cu/Al).
- ⑧ All but 60A GD & Compact HD NF switches are also UL approved for #2 Cu/Al conductors.
- ⑨ All 200A Heavy Duty Switches have a wire range & wire bending space for (1) #6-300 Kcmil (Cu/Al).
- ⑩ Also for 30A oversized heavy duty switches.
- ⑪ Also for 60A oversized heavy duty switches.

Switches

Enclosed Switches

Rotary Disconnect Switches in Non-Metallic Enclosures

Description

16–125A non-fusible switches are available in fiberglass reinforced polycarbonate enclosures which are UL approved as Type 12 & 4X and for either indoor or outdoor use. All are horsepower and load break rated. All are panel mounted and are either supplied with factory installed aux. contacts or will accept contact kits. All are compact in size while providing ample wiring space for copper line & load conductors.



Siemens Enclosed Rotary Disconnect Switches

- 16–125A, Non-Fusible
- 600VAC max. rated (except catalog no. HNF3100CX is rated 480VAC max.)
- Available in both Type 12 and 4X non-metallic enclosures
- Both screw and hinged cover designs available
- Listed and marked “suitable for use as motor disconnect” per NEC Section 430-109
- Screw cover switches are UL listed under File No. E47705 and are CSA certified under File No. 203576
- IEC 60947-3 rated and CE marked (enclosures are IP65 rated)
- HP rated
- Hinged door switches are UL listed for multiple line and load conductors per phase in 30–100A ratings. They are UL & CUL listed under File No. E191706
- Rotary handles are available in black, red, and yellow and in pistol grip designs
- 16–63A screw cover switches have factory installed ground bars. All hinge cover switches accept ground lug kits
- Screw cover switches are provided with knockouts
- Padlockable in OFF position with up to (3) padlocks

Ampere Rating	Catalog Number		Shipping Weight ^①	Horsepower Ratings			
	3 Pole, 3 Wire	3 Pole, 3 Wire with (1) NO & (1) NC Aux. Contact ^{③②}		240V AC		480V AC	600V AC
				1 Phase	3 Phase	3 Phase	3 Phase

Non-Fusible, Type 1, 4X & 12K^② with Screw Cover and Black Rotary Handle 600V AC Max.^⑤

16	3LD2064-0TB51-0US2	3LD2064-1GP51-0US2	1	1½	3	7½	10
25	3LD2164-0TB51-0US2	3LD2164-1GP51-0US2	1	3	7½	10	15
30	3LD2264-0TB51-0US2	3LD2264-1GP51-0US2	1	3	7½	15	20
30	—	3LD2264-1TS51-0US2 ^⑥ ▲	1	3	7½	15	20
30	—	3LD2264-2TW51-0US2 ^⑦ ▲	1	3	7½	15	20
63	3LD2565-0TB51-0US2	3LD2565-1GP51-0US2▲	3	10	15	40	50
100	3LD2766-0TB51-0US2	3LD2766-1GP51-0US2▲	6	—	30	60	75
125	3LD2866-0TB51-0US2	3LD2866-1GP51-0US2▲	6	—	40	75	100

Non-Fusible, Type 1, 4X & 12K^② with Screw Cover and Red and Yellow Rotary Handle 600V AC Max.^⑤

16	3LD2064-0TB53-0US2	3LD2064-1GP53-0US2	1	1½	3	7½	10
25	3LD2164-0TB53-0US2	3LD2164-1GP53-0US2	1	3	7½	10	15
30	3LD2264-0TB53-0US2	3LD2264-1GP53-0US2	1	3	7½	15	20
30	—	3LD2264-1TS53-0US2 ^⑥ ▲	1	3	7½	15	20
30	—	3LD2264-2TW53-0US2 ^⑦ ▲	1	3	7½	15	20
63	3LD2565-0TB53-0US2	3LD2565-1GP53-0US2▲	3	10	15	40	50
100	3LD2766-0TB53-0US2▲	3LD2766-1GP53-0US2▲	6	—	30	60	75
125	3LD2866-0TB53-0US2▲	3LD2866-1GP53-0US2▲	6	—	40	75	100

Ampere Rating	Catalog Number		Shipping Weight ^①	Horsepower Ratings						
	3 Pole, 3 Wire	3 Pole, 3 Wire with (1) NO & (1) NC Aux. Contact ^{③④}		120V AC		240V AC		480V AC		600V AC
				1 Phase	1 Phase	3 Phase	1 Phase	3 Phase	3 Phase	

3 Pole, Non-Fusible, Type 12^② with Screw Cover and Black Rotary Handle 480V AC Max.^③

20	HNF3020CJ ^④	—	1	¾	2	5	5	10	—
30	HNF3030CJ ^④	—	2	2	3	7½	7½	15	20
60	HNF3060CJ ^⑤	—	4	3	10	15	20	40	50
100	HNF3100CJ ^⑤	—	5	5	15	25	30	50	—

3 Pole, Non-Fusible, Type 12^② with Screw Cover and Red and Yellow Rotary Handle 480V AC Max.^③

20	HNF3020CJE ^④	—	1	¾	2	5	7½	10	—
30	HNF3030CJE ^④	—	2	2	3	7½	20	15	20
60	HNF3060CJE ^⑤	—	4	3	10	15	30	40	50
100	HNF3100CJE ^⑤	—	5	5	15	25	30	50	—

3 Pole, Non-Fusible, Type 4, 4X^⑥ with Hinged Door and Black Pistol Grip Rotary Handle 480V AC Max.^③

30	HNF3030CX	—	4	2	3	7½	7½	15	20
60	HNF3060CX	—	4	3	10	15	20	40	50
100	HNF3100CX	—	5	5	15	25	30	50	—

▲ Built to order. Allow 6–8 weeks for delivery.

① Carton quantity of (1). Shipping weight in pounds (lbs.).

② Approved for indoor/outdoor use. No cover interlock provided.

③ 30 and 60A switches are also rated 600V AC.

④ Also rated as Type 12 and UL approved for both indoor and outdoor use. Defeatable cover interlock provided.

⑤ Screw cover enclosures are constructed from Makrolon 9425. Hinged cover enclosures are constructed from fiberglass reinforced polycarbonate.

⑥ Switch is supplied with (2) NO and no NC aux. contacts.

⑦ Switch is supplied with (4) NO and no NC aux. contacts.

Ground bar is not provided or available.

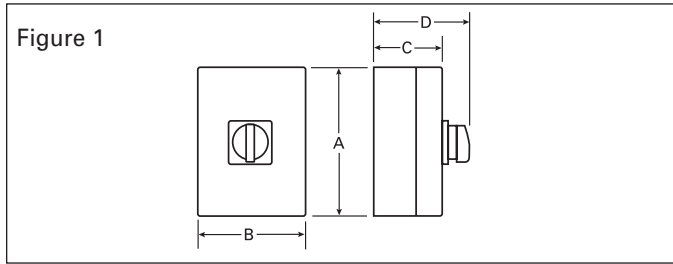
⑧ Aux. contacts break about 3 Ms before and make about 3 Ms after main switch contacts.

⑨ 6P, 25A, switch with 1 NO & 1 NC aux. contacts and a black operating handle is also available. Order catalog number 3LD2165-4VD51 (Discount Code: Pilot Devices).

Enclosed Disconnect Switch Dimensions (Inches)*

Catalog Number	Ampere Rating	Fig. No.	Dimensions			
			A	B	C	D
3LD2064-	16	1	5.52 ⁽⁴⁾	3.94	3.19	4.57
3LD2164-	25		5.52 ⁽⁴⁾	3.94	3.19	4.57
3LD2264-	30		5.52 ⁽⁴⁾	3.94	3.19	4.57
3LD2565-	63		6.93 ⁽⁵⁾	5.75	4.10	5.87
3LD2766-	100		11.90	8.35	5.36	7.13
3LD2866-	125		11.90	8.35	5.36	7.13
HNF3020CJ	20	1	4.92	2.95	3.94	5.44
HNF3020CJE	20		4.92	2.95	3.94	5.44
HNF3030CJ	30		6.89	4.92	3.94	5.44
HNF3030CJE	30		6.89	4.92	3.94	5.44
HNF3060CJ	60	1	9.46	6.31	4.77	6.27
HNF3060CJE	60		9.46	6.31	4.77	6.27
HNF3100CJ	100		11.77	7.87	5.20	6.70
HNF3100CJE	100		11.77	7.87	5.20	6.70
HNF3030CX	30	2	7.87	7.87	5.20	7.29
HNF3060CX	60		11.77	7.87	5.20	7.29
HNF3100CX	100		11.77	7.87	5.20	7.29

Note: 3LD2 Type switches only have top and bottom end KO's as follows:
16-30A - 1/2" & 3/4", 63A - 3/4" & 1", 100 & 25A - 1" & 1 1/4"



UL and CUL Short Circuit Withstand Ratings

Ampere Rating	Short Circuit Withstand Rating and Fuse Class				
	With Line Side Fusing			With Load Side Fusing ⁽¹⁾	
	5 kA at 600V Max	10 kA at 600V Max	18 kA at 480V Max	5 kA at 480V Max	18 kA at 480V Max

3LD2 Type Switches⁽⁸⁾

16	RK5 (50A Max)	—	—	—	—
25 & 30	RK5 (80A Max)	—	—	—	—
63	RK5 (175A Max)	—	—	—	—
100 & 125	—	RK5 (200A Max)	—	—	—

HNF Type Switches

30	—	H, K & RK5 (100A Max)	J, T & CC (100A Max)	H, K & RK5 (30A Max)	Ferraz Shawmut A50P or lower let-through semiconductor fuses (60A Max)
60	—	H, K & RK5 (150A Max)		H, K & RK5 (60A Max)	Ferraz Shawmut A50P or lower let-through semiconductor fuses (100A Max)
100	⑥	⑥			

① For use as supplemental protection on the load side of the branch circuit over current protective device.

② Ground lug kit has two lugs for #14-4 Cu/Al wire.

③ Factory installed ground lugs supplied as follows: 16-30A #14-10 Cu, 63A #14-8 Cu.

④ Ground lug not provided and is not available on catalog numbers 3LD2264-2TW51-0US2 and 3LD2264-2TW53-0US2.

⑤ 6.38 inches high including mounting feet.

⑥ 7.85 inches high including mounting feet.

⑦ 60 & 100A HNF switches are rated 10kA at 480V max. with line side Class H, K & RK5 150A max. fuses.

⑧ Wire range (1) #14-2 AWG 60/75 °C Cu only.

⑨ 16-63A 3LD switches are also rated 5kA at 600VAC max when protected by a 3RV type MFP of the same or lesser ampere rating.

*For inches / millimeters conversion, multiply inches by 25.4.

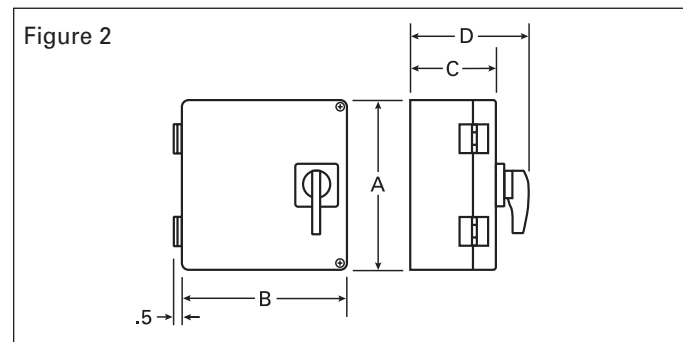
Wire ranges 60/75°C Cu Only

3LD2 Type Switches⁽³⁾

16 Amps	(1) #18-10 AWG
25-30 Amps	(1) #14-10 AWG
63 Amps	(1) #14-6 AWG
100-125 Amps	(1) #12-1 AWG

HNF Type Switches

30 Amps	(1) #14-#10 AWG Solid (1) #14-#4 AWG Stranded Up to (4) #12 AWG Solid Up to (3) #12 AWG Stranded Up to (6) #14 AWG Stranded Up to (4) #14 AWG Stranded with (1) #10 AWG Stranded
60 & 100 Amps	(1) #14-#10 AWG Solid (1) #14-#1 AWG Stranded (2) #6 AWG Stranded Up to (3) #8 AWG Stranded Up to (6) #10 AWG Stranded Up to (6) #12 AWG Solid



IEC Fuse and Withstand Ratings

Ampere Rating	gG Fuse Size	Short Circuit Rating
---------------	--------------	----------------------

3LD2 Screw Cover Switches

16	20A	5k Arms
25	25A	10k Arms
32	50A	10k Arms
63	63A	15k Arms
100	100A	20k Arms
125	125A	20k Arms

HNF Hinged Cover Switches

30	63A	10k Arms
60	100A	10k Arms
100	100A	10k Arms

Accessories

Switch Ampere Rating	Catalog Number	Description
----------------------	----------------	-------------

3LD2 Type Switches⁽³⁾

16-30A	3LD9220-2C	Neutral Kit
63A	3LD9250-2CA	Neutral Kit
100-125A	3LD9280-2C	Neutral Kit

HNF Type Switches

30-100A	GSGK60	Ground Lug Kit ⁽²⁾
30A	LBRA1	Auxiliary Contact Kit (1 NO-1 NC)
60-100A	LBRA2	Auxiliary Contact Kit (1 NO-1 NC)
30-100A	HF63CX ⁽²⁾	Neutral Kit

Switches

Disconnect Switches

Compact Non-Fusible — Rotary and Toggle

Features

- 16–250 Ampere, to 100 hp, 480V & 600V
- Rotary and Toggle actuation models
- LBR Type switches are padlockable in the OFF position and are UL & CUL listed under File No. E191706 as manual motor controllers per UL Standard UL508
- 3LD2 Type switches are padlockable in the OFF position and are UL listed under File No. E47705 per UL508 and are CSA certified under File No. 203576
- Base, DIN-rail and door mounting
- Multiple conductor, distribution terminal type rating LBR & LBT Type (40A–100A only)
- IEC 947-1 rated, CE marked
- Listed and marked “suitable as motor disconnect” per NEC Section 430-109

Application

Siemens Load Break Switches are listed as manual motor controllers and are suitable as motor disconnects. They are load break rated and act as enclosure disconnects when short circuit protection is provided upstream of the switch. If upstream over current protection is not provided, use a Siemens fusible Type VBII, CFS or MCS Disconnect Switch.

Ordering Information

Door Mounted Switches (Rotary Type Only) — Order either complete “3LD2” assemblies or individual “LBR” components as follows:

Complete Assemblies include switch, handle, and shaft. Certain 25 and 32A assemblies are also available with factory installed neutral blocks and/or aux. contacts. These accessories can also be ordered as field installed kits.

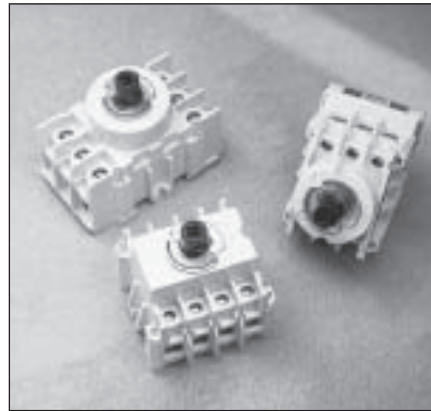
Individual Components are ordered as follows:

25A — LBR3025D switch + LBRH3 or 4 handle.

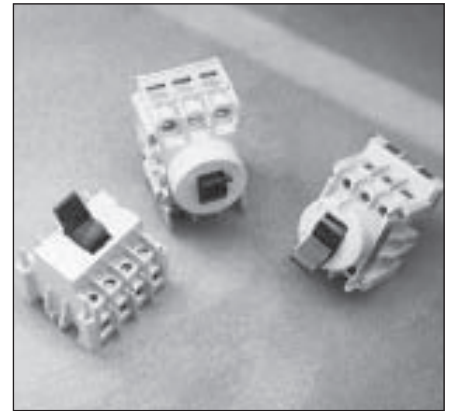
40–100A — LBR switch + LBRH3 or 4 handle + LBRD1.

Notes: (LBR Type switches only)

1. Aux contacts are available as field installed kits on 25A units only.
2. Lugs on 25A units face to the rear and lugs on 40–100A units face toward the front.



Type LBR Rotary Switches



Type LBT Toggle Switches



3LD2254-0TK51

Base/DIN Rail Mounted Switches (Rotary or Toggle Type) — Order individual components as follows:

Toggle — Order the LBT switch required and a toggle switch cover plate if needed.

Rotary, Base Mounted with Door Mounted Handle — Order “LBR” switch + door mounted handle + shaft + any accessories.

Rotary, Base Mounted with Direct Mounted Handle — Order “LBR” switch + direct mounted handle.

Short Circuit Withstand Ratings

Switch Rating & Type	Max. Line Side Fuse Rating
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5kA with Line Side Class H, K, or RK5 Fuses

25 & 32A 3LD2	80A Max. at 600V AC Max.
63A 3LD2	175A Max. at 600V AC Max.

10kA with Line Side Class H, K, or RK5 Fuses^②

25A LBR	30A Max. at 480V AC Max.
40A, 4P LBR & LBT	60A Max. at 480V AC Max.
40 & 60A, 3P LBR & LBT	100A Max. at 480V AC Max.
80 & 100A LBR & LBT	150A Max. at 480V AC Max.

18kA with Line Side Class J, T, or CC Fuses

40–100A, 3P LBR & LBT	100A Max. at 480V AC Max.
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Note: 3LD2 switches are also rated 5kA at 600V AC Max. when protected by a 3RV motor starter with a FLA rating equal to or less than the switch ampere rating.

Door Mounted Complete Assemblies (Operator, Shaft, & Switch) 600V AC Max.^②

Shaft Mounted	4 Hole Mounted	Number of Poles	Ampere Rating	AC Horsepower Ratings			
				120V 1Ø	240V 1Ø 3Ø	480V 3Ø	600V 3Ø
Catalog Number ^③	Catalog Number ^③						
—	3LD2003-1TP53 ^①	3	16	½	1½ 3	7½	10
3LD2154-0TK 3LD2154-1TP 3LD2154-1TL 3LD2154-2EP	3LD2103-0TK 3LD2103-1TP 3LD2103-1TL 3LD2103-2EP	3 3 ^① 3 + N 3 + N ^①	25	2	3 7½	10	15
3LD2254-0TK 3LD2254-1TL	3LD2203-0TK 3LD2203-1TL	3 3 + N	32	2	3 10	20	20
3LD2555-0TK	3LD2504-0TK	3	63	—	10 15	40	50
—	3LD2704-0TK	3	100	—	— 30	60	75
—	3LD2804-0TK	3	125	—	— 40	75	100

① Includes auxiliary contacts (1 NO and 1 NC).

② Handles are IP65 rated and are also UL listed for Type 1, 4X and 12 applications.

③ Add 51 for a black handle or 53 for a red & yellow handle to the end of the catalog number.

④ 100–250A 3LD2 switches are rated 10kA when protected by 200A Max. Class RK5 fuses.

Switches

Disconnect Switches

Compact Non-Fusible —
Rotary and Toggle

3LD Type Base Mounted Complete Assemblies

(Operator, Shaft, & Switch) 600V AC Max.②

Handle mounting②			Number of Poles	Ampere Rating	AC Horsepower Ratings				
Shaft (center hole)	4 Hole (no defeat)	4 Hole (with defeat)			120V	240V	480V	600V	
Catalog Number	Catalog Number	Catalog Number			1Ø	1Ø	3Ø	3Ø	3Ø
—	3LD2013-0TK5_	3LD2017-0TK1	3	16	½	1½	3	7½	10
—	—	3LD2017-1TL1	3 + N						
3LD2144-0TK5	3LD2113-0TK5	—	3	25	2	3	7½	10	15
3LD2144-1TL5	3LD2113-1TL5	—	3 + N						
3LD2244-0TK5	3LD2213-0TK5	3LD2217-0TK1	3	32	2	3	10	20	20
3LD2244-1TL53	3LD2213-1TL53	3LD2217-1TL1	3 + N						
3LD2545-0TK5	3LD2514-0TK5	3LD2517-0TK1	3	63	3	10	15	40	50
—	—	3LD2517-1TL1	3 + N						
—	3LD2714-0TK5	—	3	100	—	—	30	60	75
—	3LD2814-0TK5	—	3	125	—	—	40	75	100
—	3LD2318-0TK1	—	3	160	—	—	40	75	75
—	3LD2418-0TK1	—	3	250	—	—	50	100	75



Base Mount

3LD2217-0TK13

Accessories for Front Mounted 3LD2 Switches

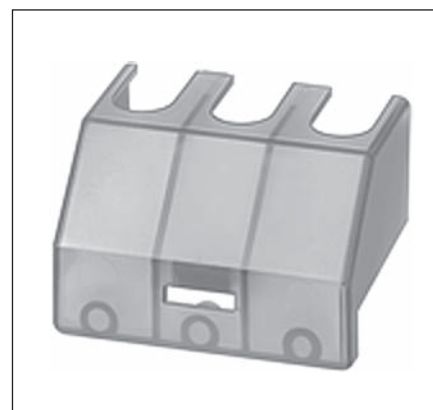
Catalog Number	Description	Switches Used With
3LD9200-5B③	1 NO, 1 NC Aux. Contact	25-125A
3LD9200-5BF③	1 NO, 1 NC Aux. with Gold Plated Contacts	25-125A
3LD9220-2B	Neutral/Ground Terminal	25 & 32A
3LD9250-2BA	Neutral/Ground Terminal	63A
3LD9280-2B	Neutral/Ground Terminal	100 & 125A
3LD9220-0B	4th Pole (leading ON, lagging OFF)	25 & 32A
3LD9250-0BA	4th Pole (leading ON, lagging OFF)	63A
3LD9280-0B	4th Pole (leading ON, lagging OFF)	100 & 125A
3LD9224-1B①	Black Handle (4 hole mtg.)	25 & 32A
3LD9284-1B①	Black Handle (4 hole mtg.)	63-125A
3LD9224-3B①	Red/Yellow Handle (4 hole mtg.)	25 & 32A
3LD9284-3B①	Red/Yellow Handle (4 hole mtg.)	63-125A
3LD9224-1D①	Black Handle (shaft mtg.)④	25 & 32A
3LD9284-1D①	Black Handle (shaft mtg.)④	63-125A
3LD9224-3D①	Red/Yellow Handle (shaft mtg.)④	25 & 32A
3LD9284-3D①	Red/Yellow Handle (shaft mtg.)④	63-125A
3LD9221-2A①	Terminal Cover 1P (Pack of 4)	25 & 32A
3LD9221-0A①	Terminal Cover 3P (Pack of 4)	25 & 32A
3LD9251-0A①	Terminal Cover 3P (Pack of 4)	63A



3LD9220-2C

Accessories for Base Mounted 3LD2 Switches

3LD9200-5C③	1 NO, 1 NC Aux. Contact	25-250A
3LD9200-5CF③	1 NO, 1 NC Aux. with Gold Plated Contacts	25-250A
3LD9220-2C	Neutral/Ground Terminal	25 & 32A
3LD9250-2CA	Neutral/Ground Terminal	63A
3LD9280-2C	Neutral/Ground Terminal	100 & 125A
3LD9240-2C	Neutral/Ground Terminal	160 & 250A
3LD9220-0C	4th Pole (leading ON, lagging OFF)	25 & 32A
3LD9250-0CA	4th Pole (leading ON, lagging OFF)	63A
3LD9280-0C	4th Pole (leading ON, lagging OFF)	100 & 125A
3LD9240-0C	4th Pole (leading ON, lagging OFF)	160 & 250A
3LD9224-1B①	Black Handle (4 hole mtg. no defeat)	25 & 32A
3LD9284-1B①	Black Handle (4 hole mtg. no defeat)	63-125A
3LD9224-3B①	Red/Yellow Handle (4 hole mtg. no defeat)	25 & 32A
3LD9284-3B①	Red/Yellow Handle (4 hole mtg. no defeat)	63-125A
3LD9224-1D①	Black Handle (shaft mtg.)	25 & 32A
3LD9284-1D①	Black Handle (shaft mtg.)	63-125A
3LD9224-3D①	Red/Yellow Handle (shaft mtg.)	25 & 32A
3LD9284-3D①	Red/Yellow Handle (shaft mtg.)	63-125A
3LD9221-2A①	Terminal Cover 1P (Pack of 4)	25 & 32A
3LD9221-0A①	Terminal Cover 3P (Pack of 4)	25 & 32A
3LD9251-0A①	Terminal Cover 3P (Pack of 4)	63A



3LD9251-0A

Note: 3LD2 shaft lengths allow the following maximum enclosure depths from the switch mounting surface to the outside of the cover:

16-32A, 15.25"
63-125A, 15.75"
160 & 250A, 23.70"

① Handles and line side terminal covers are supplied as standard with 3LD2 switches.

② Add suffix 1 for a black or 3 for a red & yellow handle to the catalog number (except 3LD2244-1TL53 & 3LD2213-1TL53). Handles are IP65 rated and are also listed by UL for Type 1, 4X and 12 applications.

③ Aux. contacts break about 30 Ms before and make about 3 Ms after main switch contacts.

Ratings	10A	at 120V AC
	6A	at 240V AC
	1.4A	at 480V AC

④ Can be used as replacement handles on enclosed 3LD2 switches.

⑤ Base mounted switches with direct mount handles are also available (3LD2330-0TK1_⑤ rated 160A and 3LD2430-0TK1_⑤ rated 250).

Switches

Disconnect Switches

Compact Non-Fusible — Rotary and Toggle

Individual Components and Assemblies

Recommended for Basemount. For Door mounting only, use LBRD1.[®]

Rotary and Toggle Switches

Catalog Number	Switch Type	No. of Poles	Ampere Rating	Max AC Volt	AC Horsepower Ratings				
					115V 1Ø	240V 1Ø	240V 3Ø	480V 3Ø	600V 3Ø
LBR3025	Rotary	3	25	480	¾	2	5	10	—
LBR3025D ^①	Rotary	3	25	480	¾	2	5	10	—
LBR3040	Rotary	3	40	600	2	3	7½	20	25
LBR3060	Rotary	3	60	480	2	5	10	25	—
LBR3080	Rotary	3	80	600	3	10	20	40	50
LBR3100	Rotary	3	100	480	5	15	25	50	—
LBR4040	Rotary	4	40	480	2	3	7½	20	—
LBT3040	Toggle	3	40	600	2	3	7½	20	25
LBT3060	Toggle	3	60	480	2	5	10	25	—
LBT3080	Toggle	3	80	600	3	10	20	40	50
LBT3100	Toggle	3	100	480	5	15	25	50	—
LBT4040	Toggle	4	40	480	2	3	7½	20	—



Standard Duty Rotary Switch Door Handles



Heavy Duty Rotary Switch Door Handle

LBR Type Handles

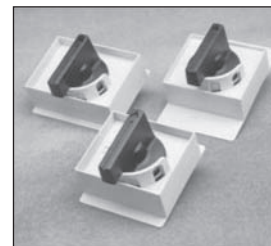
Catalog Number	Used on Rotary Switches	NEMA Type	Mounting	Marking	Color	Cover Interlock Supplied	Padlockable
Standard Duty							
LBRH2 ^②	All	1	Door	ON/OFF	Black	No	No
LBRH3 ^②	All	1, 3R, 12, 4X	Door	O/I, ON/OFF	Black	Yes ^①	Yes
LBRH4 ^②	All	1, 3R, 12, 4X	Door	O/I, ON/OFF	Red/Yel	Yes ^①	Yes
LBRH9 ^②	All (Pistol Grip Type)	1, 3R, 12, 4X	Door	O/I, ON/OFF	Black	Yes	Yes
LBRH10 ^②	All (Pistol Grip Type)	1, 3R, 12, 4X	Door	O/I, ON/OFF	Red/Yel	Yes	Yes
LBRH5	25 Amps	1	Direct Mount	O/I	Black	—	Yes
LBRH6	3-Pole, 40-60 Amps	1	Direct Mount	O/I	Black	—	Yes
LBRH7	3-Pole, 80-100 Amps	1	Direct Mount	O/I	Black	—	Yes
LBRH8	4-Pole, 40-60 Amps	1	Direct Mount	O/I	Black	—	Yes
Heavy Duty							
CFSH10B12	All	1, 3R, 12	Door	O/I, ON/OFF	Black	Yes	Yes
CFSH10R12	All	1, 3R, 12	Door	O/I, ON/OFF	Red/Yel	Yes	Yes

LBR Type Rotary Shafts

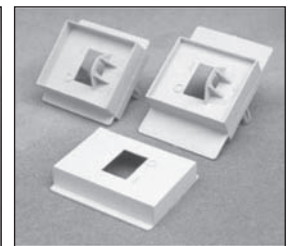
Catalog No	Length In. (mm)
For Standard Duty Handles	
LBR5040	1.57 (40)
LBR5050	1.97 (50)
LBR5055	2.17 (55)
LBR5080	3.15 (80)
LBR5120	4.72 (120)
LBR5180	7.09 (180)
LBR5305	12.00 (305)
For Heavy Duty Handles	
CFSS200H	7.9 (200)
CFSS400H	15.7 (400)



Rotary Shafts



Rotary Switch Direct Mount Handles



Toggle Switch Cover Plates

25 Amp, 4th Pole

Used on Catalog No	Catalog Number
LBR3025	LBRP25
LBR3025D	LBRP25D

Auxiliary Switch Kits

Used on Rotary Switch	Catalog Number	Contact Arrangement
LBR3025	LBRA25 ^{③④}	1 NO & 1 NC
LBR3025D	LBRA25D ^{③④}	1 NO & 1 NC
LBR3040, LBR3060	LBRA1 ^{③④}	1 NO/1 NC with common point
LBR3080, LBR3100	LBRA2 ^{③④}	1 NO/1 NC with common point

LBR Type Toggle Switch Cover Plate

Used on Toggle Switches	Catalog Number
LBT3040, LBT3060	LBTCP1
LBT3080, LBT3100	LBTCP2
LBT4040	LBTCP3

LBR Type Rotary Switch Door Mounting Kit (For use with LBRH3 & LBRH4 only)

Used on Rotary Switch	Catalog Number
40-100 Amps	LBRD1 [®]

LBR/LBT Neutral Kit^⑤

Used with Catalog Number	Catalog Number
All	HF63CX

① No cover interlock defeat mechanism provided. To eliminate cover interlock, order additional catalog number LBRDC1.

② LBRH2 is IP54 rated. All others are IP65.

③ Ratings

15.1A resistive at 250V AC max.
.5A at 125V DC
.25A at 250V DC
.5 HP at 250V AC max.

④ Auxiliary switch contacts break about 30 Ms before and make about 3 Ms after main switch contacts.

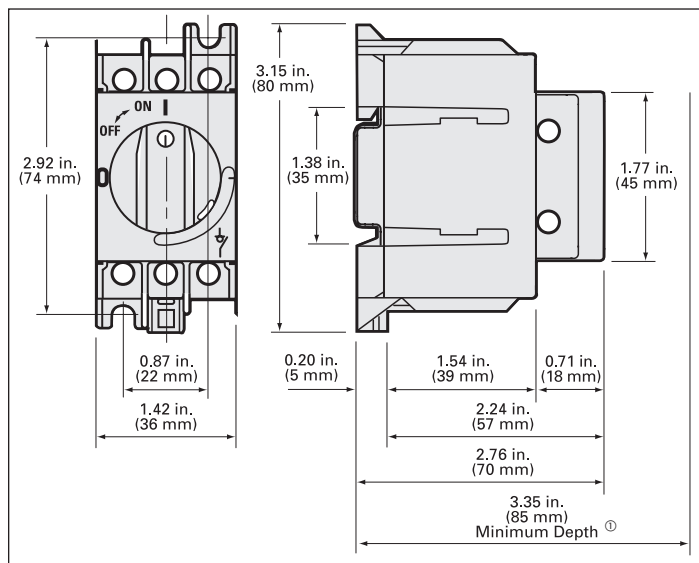
⑤ Lug wire ranges:
HF63CX—(1) #14-2 AWG 60/75°C Cu only

⑥ Only door mountable and for use with LBRH3 & 4 handles only.

⑦ For door mounting of 40-100A LBR switches use door mounting kit LBRD1 & LBRH3 or 4 handle.

⑧ LBRD1 does not require shaft.

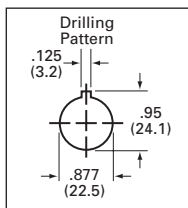
Dimension Drawings and Wire Ranges



LBR 3025

Wire Ranges 60/75°C Cu only

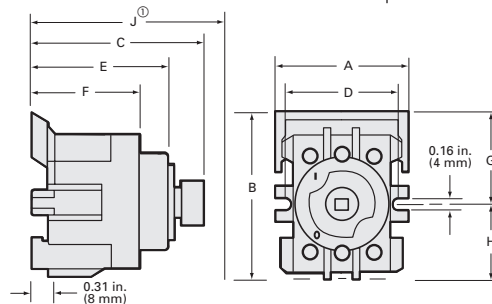
25 Amps LBR	(1) #14 - #10 AWG Solid (1) #14 - #8 AWG Stranded
40 & 60 Amps LBR & LBT	(1) #14 - #10 AWG Solid (1) #14 - #4 AWG Stranded Up to (4) #12 AWG Solid Up to (3) #12 AWG Stranded Up to (6) #14 AWG Stranded Up to (4) #14 AWG Stranded with (1) #10 AWG Stranded
80 & 100 Amps LBR & LBT	(1) #14 - #10 AWG Solid (1) #14 - #1 AWG Stranded (2) #6 AWG Stranded Up to (3) #8 AWG Stranded Up to (6) #10 AWG Stranded Up to (6) #12 AWG Solid
16A, 3LD20 25A, 3LD21 32A, 3LD22 63A, 3LD25 100, 125A, 3LD2 160, 250A, 3LD2	(1) #18-10 AWG (1) #14-8 AWG (1) #14-8 AWG (1) #14-6 AWG (1) #12-1 AWG (1) #1-400 MCM



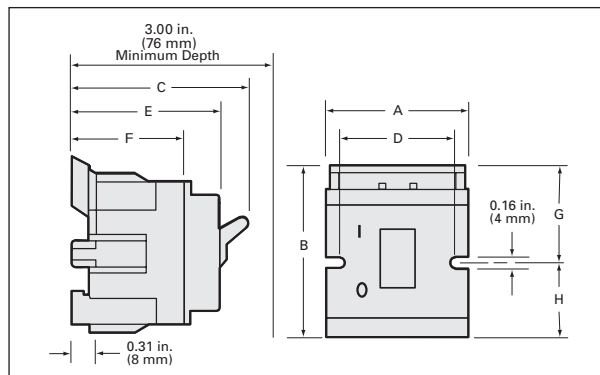
Shaft Mounted
3LD2 Handle Cutout
(4-hole pattern)

Dimension J Minimum Depth^①

Switch	Dimension J
LBR 40-100A	3.35 (85)
3LD2 25 & 32A Front Shaft Mounted	3.07 (78)
3LD2 63 Front Shaft Mounted	3.35 (85)
3LD2 16-32A Front 4-hole Mounted	2.13 (54)
3LD2 63A Front 4-hole Mounted	2.48 (63)
3LD2 100 & 125A Front 4-hole Mounted	2.56 (65)
3LD2 25 & 32A Base w/shaft Mtg. Handle	6.46 (164)
3LD2 63A Base w/shaft Mtg. Handle	6.77 (172)
3LD2 16-32A Base w/4-hole Mtg. Handle	5.59 (142)
3LD2 63A Base w/4-hole Mtg. Handle	5.99 (152)
3LD2 100-250A Base w/4-hole Mtg. Handle	6.07 (154)



LBR 40-100 Amps & 3LD2 16-250A



LBT Toggle — 40-100 Amps

Switch Type	Switch Catalog Number	Dimensions Inches (mm)							
		A	B	C	D	E	F	G	H
Rotary	LBR3040	2.00 (51)	2.72 (69)	2.72 (69)	1.78 (45)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)
Rotary	LBR3060	2.00 (51)	2.72 (69)	2.72 (69)	1.78 (45)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)
Rotary	LBR3080	2.09 (53)	3.32 (84)	2.92 (74)	1.97 (50)	2.29 (58)	1.69 (42)	1.66 (42)	1.66 (42)
Rotary	LBR3100	2.09 (53)	3.32 (84)	2.92 (74)	1.97 (50)	2.29 (58)	1.69 (42)	1.66 (42)	1.66 (42)
Rotary	LBR4040	2.42 (61)	2.72 (69)	2.72 (69)	2.28 (58)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)
Rotary Front Mtg.	3LD20 ^②	1.89 (48)	1.97 (50)	1.97 (50)	—	—	—	—	—
Rotary Front Mtg.	3LD21 & 2 ^②	1.81 (46)	2.17 (55)	1.97 (50)	—	—	—	—	—
Rotary Front Mtg.	3LD25 ^②	2.36 (60)	2.52 (64)	2.32 (59)	—	—	—	—	—
Rotary Front Mtg.	3LD27 & 8 ^②	2.40 (61)	3.27 (83)	2.40 (61)	—	—	—	—	—
Rotary Base Mtg.	3LD20 ^②	1.89 (48)	1.97 (50)	2.29 (58)	—	—	—	—	—
Rotary Base Mtg.	3LD21 & 2 ^②	1.81 (46)	2.17 (55)	2.29 (58)	—	—	—	—	—
Rotary Base Mtg.	3LD25 ^②	2.36 (60)	2.52 (64)	2.68 (68)	—	—	—	—	—
Rotary Base Mtg.	3LD27 & 8 ^②	2.80 (71)	3.27 (83)	2.76 (70)	—	—	—	—	—
Rotary Base Mtg.	3LD23 & 4	4.41 (112)	5.83 (148)	4.10 (104)	—	—	—	—	—
Toggle	LBT3040	2.00 (51)	2.72 (69)	2.75 (70)	1.78 (45)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)
Toggle	LBT3060	2.00 (51)	2.72 (69)	2.75 (70)	1.78 (45)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)
Toggle	LBT3080	2.09 (53)	3.32 (84)	2.90 (74)	1.97 (50)	2.29 (58)	1.69 (42)	1.66 (42)	1.66 (42)
Toggle	LBT3100	2.09 (53)	3.32 (84)	2.90 (74)	1.97 (50)	2.29 (58)	1.69 (42)	1.66 (42)	1.66 (42)
Toggle	LBT4040	2.42 (61)	2.72 (69)	2.75 (70)	2.28 (58)	2.16 (55)	1.67 (42)	1.50 (38)	1.22 (31)

① Depth from outside of cover to back of switch.

② Handle front plate dimensions:
3LD 16-32A—2.64 inches square
3LD 63-125—3.55 inches square

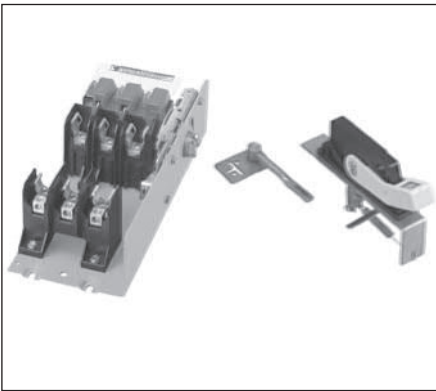
Switches

Disconnect Switches

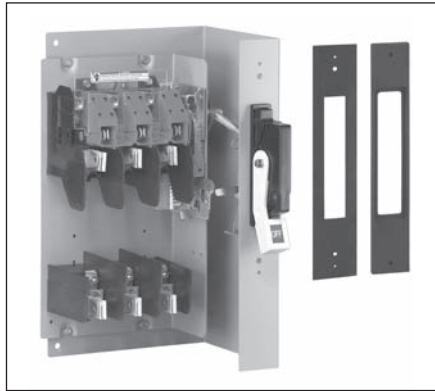
Type VBII (30-600A) with Flange Mounted Operating Handle

Features

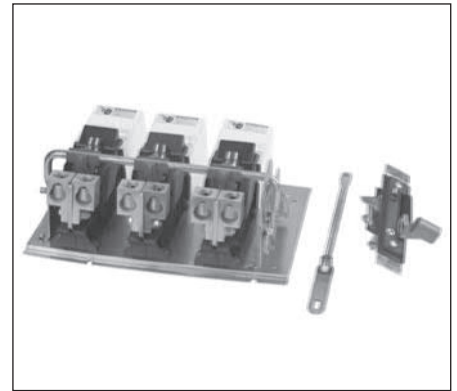
- 30-600A, 600VAC and DC ratings
- 240 & 600V AC switches are UL Recognized under file number E121152, Vol. 3 and CSA certified under file number 154852
- 600V DC Photovoltaic switches are UL Recognized under file number E335018, Vol. 3 and are rated to switch 3 separate 600V DC circuits
- Visible blade quick make and break switching action
- Panel and Flange mounted assemblies facilitate installation
- Panel mounted switches are variable depth
- Short circuit rating of 10,000 AIC with class H fuse, and of 200,000 AIC with class R or J fuses. PV switches are rated 10,000 AIC at 600V DC with 600V DC rated class K, J or R fuses.
- Flange mounted handles rated as Type 1, 3R & 12 or 4X are padlockable in the off position with up to (3) padlocks with 5/16 hasps
- Meets UL98 requirements and suitable for both main and branch circuit applications
- A complete line of aux contacts are available
- Load break and horsepower rated
- Defeatable cover interlock standard with all handles
- Meets NFPA79 requirements
- Seismic qualified — complies with the 2010 California Building Code (CBC) — and with the International Building Code (IBC) — Compliance Level SDS = 1.85 g



VBFS361, VBLK1 & VBH1



VBFS363F



VBNFS365, VBLK4 & VBH2

Ordering Information

1. Determine the ratings required (amps, volts, HP, Fusible, NF), the mounting needed (Panel or Flange), and select the appropriate switch.
2. For panel mounted switches with a rigid operating shaft (30-600A), order panel mounted switch, flange mounted operating handle & rigid linkage kit based on depth required.
3. For panel mounted switches with a Max-Flex operator, order panel mounted switch, Max-Flex Handle & Adapter Kit and drive cable.
4. Select accessories if required.

Switches—for Standard 600V Max AC or DC Applications

Switch Ampere Rating	Max. AC Voltage Rating	Catalog Number	Horsepower Rating, Switches and 3-Phase ^④						600 Volts DC (max) ^④
			240 Volts AC		480 Volts AC		600 Volts AC		
			Standard	Max.	Standard	Max.	Standard	Max.	
Fusible Panel Mounted Variable Depth Switches - 3-Pole ^⑤									
30	240	VBFS321	3	7 1/2	—	—	—	—	— ^①
60	240	VBFS322	7 1/2	15	—	—	—	—	— ^②
30	600	VBFS361	—	—	5	15	7 1/2	20	15 ^③
60	600	VBFS362	—	—	15	30	15	50	30 ^③
100	600	VBFS363	—	—	25	60	30	75	50 ^③
200	600	VBFS364	—	—	50	125	60	150	50
400	600	VBFS365	—	—	100	250	125	350	— ^⑨
600	600	VBFS366	—	—	150	400	200	500	— ^⑨
Non-fusible Panel Mounted Variable Depth Switches - 3-Pole ^⑤									
30	600	VBNFS361	—	10	—	20	—	30	15 ^③
60	600	VBNFS362	—	20	—	50	—	60	30 ^③
100	600	VBNFS363	—	40	—	75	—	100	50 ^③
200	600	VBNFS364	—	60	—	125	—	150	50
400	600	VBNFS365	—	125	—	250	—	300	— ^⑨
600	600	VBNFS366	—	200	—	400	—	500	— ^⑨
Fusible Flange Mounted Switches - 3-Pole ^⑤									
30	240	VBFS321F	3	7 1/2	—	—	—	—	— ^①
60	240	VBFS322F	7 1/2	15	—	—	—	—	— ^②
30	600	VBFS361F	—	—	5	15	7 1/2	20	15 ^③
60	600	VBFS362F	—	—	15	30	15	50	30 ^③
100	600	VBFS363F	—	—	50	60	30	75	50 ^③
200	600	VBFS364F	—	—	100	125	60	150	50
Non-fusible Flange Mounted Switches – 3-Pole ^⑤									
30	600	VBNFS361F	—	10	—	20	—	30	15 ^③
60	600	VBNFS362F	—	20	—	50	—	60	30 ^③
100	600	VBNFS363F	—	40	—	75	—	100	50 ^③
200	600	VBNFS364F	—	60	—	125	—	150	50

Note: Fusible switches include fuse provisions for Class H Fuses. The load base can be moved to pre-drilled holes for Class J Fuses on all 600V switches. If Class R Fuses are required, add a Class R Fuse Clip Kit.

Switches—for Photovoltaic Applications, 600VDC Max.^⑦ (for use in negative ground systems only)

Switch Ampere Rating	Catalog Number	Rated Isc per NEC Article 690
Fusible Panel Mounted Variable Depth Switches—3 Pole^{⑤⑧}		
30	VBFS361PV	19.2A
60	VBFS362PV	38.4A
100	VBFS363PV	64.0A
Non-Fusible Panel Mounted Variable Depth Switches—3 Pole^⑤		
30	VBNS361PV	24.0A
60	VBNS362PV	48.0A
100	VBNS363PV	80.0A
Fusible Flange Mounted Variable Depth Switches—3 Pole (Includes Type 1, 3R and 12 Rated Operating Handle)^{⑤⑧}		
30	VBFS361FPV	19.2A
60	VBFS362FPV	38.4A
100	VBFS363FPV	64.0A
Non-Fusible Flange Mounted Variable Depth Switches—3 Pole (Includes Type 1, 3R and 12 Rated Operating Handle)^⑤		
30	VBNS361FPV	24.0A
60	VBNS362FPV	48.0A
100	VBNS363FPV	80.0A

- ① Rated 5 HP at 250V DC.
- ② Rated 10 HP at 250V DC.
- ③ 600V DC & 600V DC horsepower rating shown requires (2) poles to be connected in series.
- ④ Std. - applies when non-time delay fuses are used.
Max. - applies when time delay fuses are used.
- ⑤ Includes line base, load base, operating mechanism and line and load lugs.
Order operating handle and linkage kits from tables on pages 18/21 or 18/22.
- ⑥ Includes line base, load base, operating mechanism line and load lugs plastic operating handle and required linkage.
- ⑦ All photovoltaic switches are rated to be used with 3 separate 600V DC circuits.
- ⑧ Fusible switches accept Class K or R fuses as standard and Class J fuses by relocating the load base.
- ⑨ Rated 250V DC max and 50HP at 250V DC.

Cable Kit

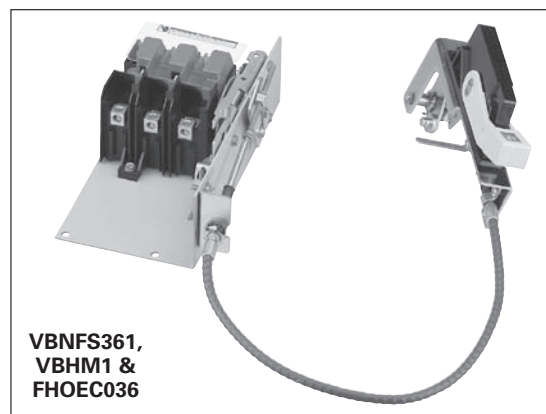
For use with 30-200A panel mounted switches and Max-Flex handle and adapter kit.

Catalog Number	Description
FHOEC036	36" long drive cable
FHOEC048	48" long drive cable

Max-Flex™ Handle and Adapter Kit

(Type 1, 12, 3R & 4X) Use with 30-200A panel mounted switches and cable kit.

Catalog Number	Operating Handle Description
Plastic Handles	
VBHM1	30-200A Type 1, 3R, 12 and 4X
Metal Handles	
VBHM2	30-200A Type 1, 3R and 12
VBHM2X	30-200A Type 4X



Switches

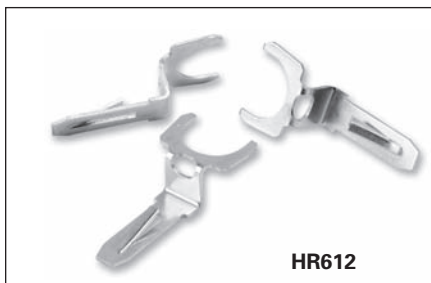
Disconnect Switches

Accessories Type VBII

Flange Mounted Operating Handles

For use with Panel Mounted Switches. Plastic handle is included with Flange Mounted Switches as standard.

Catalog Number	Operating Handle Description
Plastic Handles	
VBH1	30-200A Type 1, 3R & 12
VBH14X	30-200A Type 4X
Metal Handles	
VBH112	30-200A Type 1, 3R & 12
VBH14	30-200A Type 4X
VBH2	400A Type 1 & 12
VBH2R	400 & 600A Type 1, 3R & 12
VBH24X	400 & 600A Type 4X



HR612

Class R Fuse Clip Kits

These kits prevent the installation of Class H and K fuses (one kit required per switch).

Class R Fuse Clip Kits

Catalog Number	Description
HR21	30A, 240V Kit (HD only)
HR612	30A, 600V Kit/60A, 240V Kit
HR62	60A, 600V Kit
HR63	100A Kit
HR64	200A Kit
HR656	400A/600A Kit

Internal Door Latch Kits

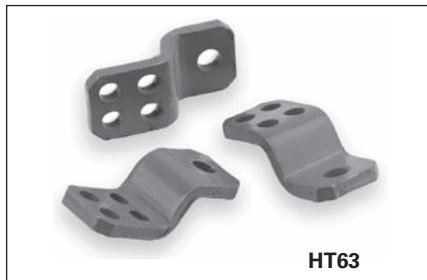
For use with enclosures with door mounted latching bar. Required when a flange mounted switch is mounted in a Hoffmann or Rittal enclosure provided with an AB cutout.

Catalog Number	Description
DKR2	2 point (for use with enclosures less than 40" high)
DKR3	3 point (for use with enclosures 40" or larger in height)

Rigid Linkage Kits

For use with Panel Mounted Switches. Not required for Flange Mounted Switches.

Catalog Number	Switch Ampere Rating	Enclosure Depth ^①	
		Min	Max.
VBLK1	30-200	6.94 ^②	6.94 ^②
VBLK2	30-200	6.94 ^②	19.0
VBLK3	400 & 600	9.00	8.75
VBLK4	400 & 600	9.00	19.0



HT63

Class T Fuse Adapter Kits

100-600A fusible switches are field convertible to accept Class T fuses. 400-600A switches are field convertible to accept Class T fuses by moving the load base to a pre-drilled T fuse position.

Class T Fuse Adapter Kits^③

Catalog Number	Description
HT23	100A, 240V Kit
HT63	100A, 600V Kit
HT24	200A, 240V Kit
HT64▲	200A, 600V Kit

Class J Fuse Provisions

All 30-600A, 600V fusible switches are field convertible to accept Class J fuses by moving the load base to a pre-drilled J fuse position.

Window Kits (Type 1, 12, 3R and 4x)

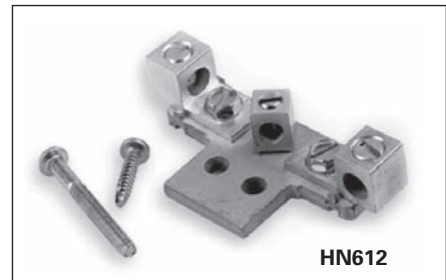
Allows viewing of visible blades and of indicating fuses through 200A.

Catalog Number	Description
VBWK1	30A Window Kit
VBWK2	60 & 100A Window Kit
VBWK3	200-600A Window Kit

NEW Quick Connects

They provide two point control power take-off capability and are normally used on two poles on the line side when it is required to have control power available when the switch is in the OFF position. They provide a mounting provision for standard ¼" quick connect terminal. Installed in the line or load side. 30A VBII switches have lugs UL listed to accept (2) wires per pole as standard so a 30A kit is not required.

Catalog Number	Description
HCQ62	60A 2 wire quick connect kit
HCQ63	100A 2 wire quick connect kit
HCQ64	200A 2 wire quick connect kit



HN612

Neutral Kits^④

Standard Neutral Kits can be field installed in 30-100A switches.

Neutral Kits

Switch Ampere Rating	Kit Catalog Number
30A 600V, 60A 240V	HN612
60A, 600V & 100A	HN623

200% Neutral Kits^④

UL listed 200% Neutrals are available on 60 & 100A switches. They are typically used with non-linear transformers or where increased neutral ampacity/lug capacity is required.

200% Neutral Kits

Switch Ampere Rating	Kit Catalog Number	Wire Range Line & Load Lugs (Cu/Al)
60 & 100A	HN263	(2) #14-1/0 AWG

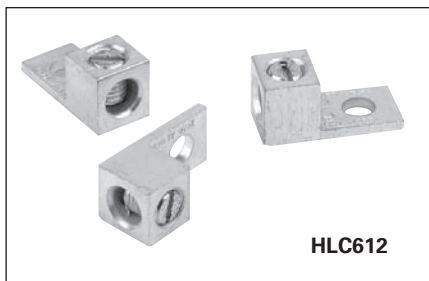
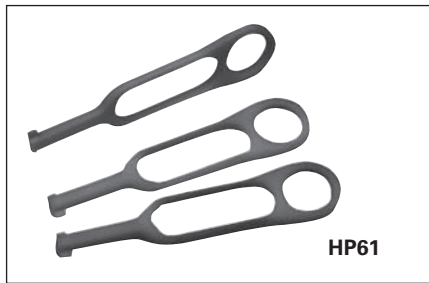
▲ Built to order. Allow 6-8 weeks for delivery.

① Dimensions (min. & max.) from enclosure mounting pan to outside surface of enclosure handle mounting flange.

② 7.12 for 200A switches.

③ One kit per pole required.

④ UL approved (not CSA certified).



Auxiliary Contacts

The auxiliary contacts are available in 1 normally open and 1 normally closed or 2 normally open and 2 normally closed configurations. Siemens offers a PLC Auxiliary Switch (30-200A) that has very low resistance for low voltage and current typical in PLC circuits. All auxiliary contacts make after and break before main switch contacts.

Switch Ampere Rating	Aux. Switch Catalog Number	Kit Ampere Rating			Kit Horsepower Rating		
		125V AC Max.	250V AC Max.	28V DC Max.	125V AC Max.	250V AC Max.	28V DC Max.

With 1 NO & 1 NC Isolated Contacts

30-200	HA161234	10	10	—	1/2	3/4	—
400-600	HA165678	10	10	—	1/2	3/4	—

With 2 NO & 2 NC Isolated Contacts

30-200	HA261234	10	10	7	1/2	3/4	—
400-600	HA265678	10	10	7	1/2	3/4	—

Low Current PLC Type with 1 NO & 1 NC Gold Plated Contacts

30-200	HA361234	10	10	—	1/2	3/4	—
400-600	HA365678	10	10	—	1/2	3/4	—

Fuse Puller Kits

Fuse Puller Kits are field installable in 30-100A Type VBII Heavy Duty Switches (one kit required per 3-pole switch).

Switch Ampere Rating	Fuse Puller Kit Catalog Number
30	HP61
60	HP62▲
100	HP63▲

Copper Lug Kits

All switches are UL approved to accept field installed copper lug kits.

Switch Ampere Rating	Copper Lug Catalog Number	Description
30-60	HLC612	(9) Lugs/Kit #14-4 AWG Cu
100	HLC63▲	(9) Lugs/Kit #14-1/0 AWG Cu
200	HLC64▲	(9) Lugs/Kit #6 AWG-300 Kcmil Cu
400-600A	HLC65678	(1) Lugs/Kit #1/0 AWG-600 Kcmil Cu

Equipment Ground Kits

Equipment Ground Lug Kits are available for all switches.

Switch Ampere Rating	Catalog Number	Number of Terminals	Wire Range Per Terminal (Cu/Al)
30-200	HG61234	2	#14-4 AWG
400 & 600	HG656	4	#6 AWG-250 Kcmil

NEW Internal Shield Kits (for fusible switches)

Kits provide a "skirt" that encloses the VBII switch and also a clear plastic inner door to prevent accidental contact with live parts. Test probe holes are provided and fuses can be replaced without removal of kit.

Switch Ampere Rating	Shield Kit Catalog Number
30A	HSK61
60-100A	HSK623
200A	HSK64

▲ Built to order. Allow 6-8 weeks for delivery.

Switches

Disconnect Switches

Type VBII Lug Wire Ranges & Dimensions

Lugs

30 & 60A switches are suitable for use with 60° or 75°C wire. 100–600A switches are suitable for use with 75°C rated wire. All switches are supplied with factory installed line and load lugs.

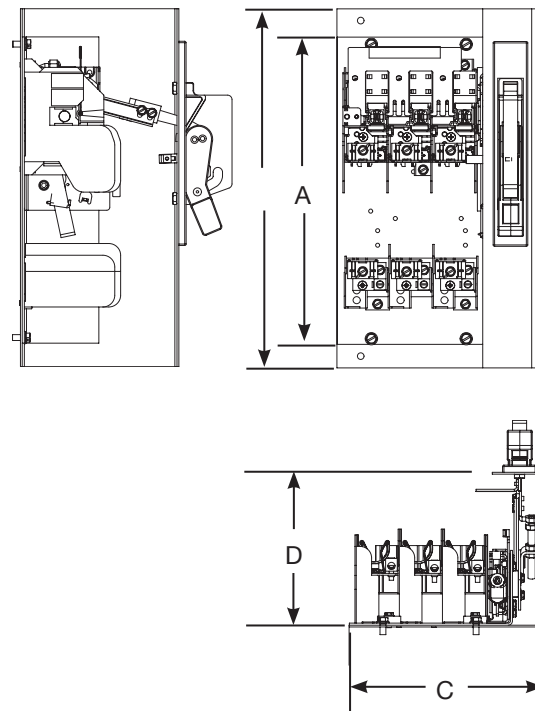
Wire Ranges (Line, Load and Standard Neutral)

Switch Ampere Rating	UL Approved Wire Range	Lug Wire Range
30	#14-6 AWG (Cu/Al)	#14-2 AWG (Cu/Al)
60	#14-2 AWG (Cu/Al)	#14-2 AWG (Cu/Al)
100	#14-1/0 AWG (Cu/Al)	#14-1/0 AWG (Cu/Al)
200	#6 AWG-300 Kcmil (Cu/Al)	#6 AWG-300 Kcmil (Cu/Al)
400	1/0 AWG-750 Kcmil (Cu/Al) or (2) 1/0 AWG-250 Kcmil (Cu/Al)	(1) 1/0 AWG-750 Kcmil (Cu/Al) or (2) 1/0 AWG-250 Kcmil (Cu/Al)
600	(2) 1/0 AWG-750 Kcmil (Cu/Al) or (4) 1/0 -250 Kcmil (Cu/Al)	(2) 1/0 AWG-750 Kcmil (Cu/Al) or (4) 1/0 AWG-250 Kcmil (Cu/Al)

Approximate Dimensions

Mounting bracket shown with handle installed is supplied with Flange Mounted Switches only. All Panel Mounted Switches have a "L" shaped mounting pan with a line base, load base (if fusible) and mechanism installed.

Catalog Number	Dimensions				
	A	B	C ^①	D (min)	D (max)
Fusible, Panel Mounted					
VBFS321	11.88	N/A	7.47	6.94	19
VBFS322	13.12	N/A	8.50	6.94	19
VBFS361, PV	11.88	N/A	7.47	6.94	19
VBFS362, PV	13.12	N/A	8.50	6.94	19
VBFS363, PV	13.12	N/A	8.50	6.94	19
VBFS364	17	N/A	12.33	7.12	19
VBFS365	26.25	N/A	16.50	8.63	19
VBFS366	26.25	N/A	16.50	8.63	19
Non-fusible, Panel Mounted					
VBNFS361, PV	9.79	N/A	7.47	6.94	19
VBNFS362, PV	9.79	N/A	8.50	6.94	19
VBNFS363, PV	9.79	N/A	8.50	6.94	19
VBNFS364	10.77	N/A	12.33	7.12	19
VBNFS365	13	N/A	16.50	8.63	19
VBNFS366	13	N/A	16.50	8.63	19
Fusible, Flange Mounted					
VBFS321F	11.88	14.08	7.47	7.27	N/A
VBFS322F	13.12	15.83	8.85	7.27	N/A
VBFS361F, PV	11.88	14.08	7.47	7.27	N/A
VBFS362F, PV	13.12	15.83	8.85	7.27	N/A
VBFS363F, PV	13.12	15.83	8.85	7.27	N/A
VBFS364F	17	18.20	12.68	7.57	N/A
Non-fusible, Flange Mounted					
VBNFS361F, PV	9.79	11.78	7.47	7.27	N/A
VBNFS362F, PV	9.79	11.78	8.85	7.27	N/A
VBNFS363F, PV	9.79	11.78	8.85	7.27	N/A
VBNFS364F	10.77	11.97	12.68	7.57	N/A



^① Dimension C for panel mounted switches indicates the minimum width from the left hand edge of the switch mounting pan to the right hand inside surface of the enclosure.

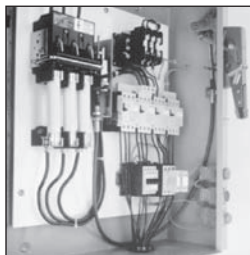
Switches

Disconnect Switches

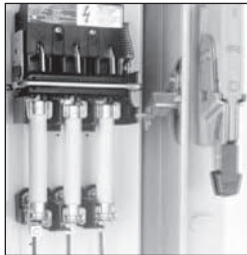
Type MCS (30-200A) —
Switches, Fuse and No Fuse Kits

Features

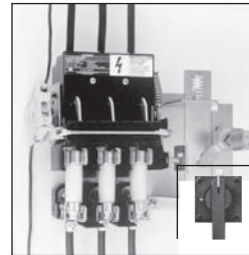
- 30, 60, 100 and 200 Ampere Switches
- UL Recognized (file # E121152 vol. 1 & 2) and CSA Certified
- Simple Mounting — with an integral switch and over center mechanism
- Horsepower & load break rated
- Compact Size
- Visible Blade Contacts
- Rugged Construction — with a short circuit current rating of 10,000 amps with Class H or 200,000 amps at 600V maximum AC, when fused with Class R or Class J fuses
- Available with three operator handle options, allowing flexible placement of switch
- Field Installable Auxiliary Contacts
- Flexible Fuse Class Configurations
- Flange mounted handles meet NFPA79 requirements



Type MCS Disconnect Switch with Max-Flex™ handle operator



Type MCS Disconnect Switch with fixed-depth, flange-mounted handle



Type MCS Disconnect Switch with rotary handle

Ordering Information

- Select the basic switch size you need (30, 60, 100 or 200 ampere).
- Check the switch selected against the maximum horsepower rating required for our application. "L" or "R" suffix on switch catalog numbers denotes left or right-handed mechanism drive.
- Choose either fuse or no fuse kit from chart below.
- Check "Minimum Dimensions" on page 18/26 for installation space requirements.
- Select from the list of handle operators, the type which best suits your application. Handle operators can be selected from the next page.

Basic Switches

Switch Ampere Rating	Maximum Voltage Rating	Catalog Number Right Hand	Catalog Number Left Hand	Maximum Horsepower Rating, 3 Phase ^④						250 Volts DC (max) ^④
				240 Volts AC		480 Volts AC		600 Volts AC		
				Standard Fuse	Time Delay Fuse	Standard Fuse	Time Delay Fuse	Standard Fuse	Time Delay Fuse	
30	600	MCS603R	MCS603L	3	7½	5	15	7½	20	5
60	600	MCS606R	MCS606L	7½	15	15	30	15	50	10
100	600	MCS610R	MCS610L▲	15	30	25	60	30	75	20
200	600	MCS620R	MCS620L▲	25	60	50	125	60	150	40

Fuse And No Fuse Kits (Includes load base plus line and load fuse clips)^①

Basic Switch Ampere Rating	Switch Catalog Number	Kit Description	No Fuse Kits		For Class H	For Class J	For Class R	Lug Wire Size
			Standard	Cu Only ^②	Catalog Number ^①	Catalog Number ^①	Catalog Number ^①	
			Catalog Number	Catalog Number				
30	MCS603R or MCS603L	No Fuse	TMK606	—	—	—	—	#14 to #4 AWG Cu/Al
		30A, 250V	—	—	FCK203▲	—	FCRK203	
		30A, 600V	—	—	FCK206	FCJK603	FCRK206	
		60A, 250V	—	—	FCK206	—	FCRK206	
		60A, 600V	—	—	FCK606	FCJK606	FCRK606	
60	MCS606R or MCS606L	No Fuse	TMK606	—	—	—	—	#14 to #4 AWG Cu/Al
		60A, 250V	—	—	FCK206	—	FCRK206	
		60A, 600V	—	—	FCK606	FCJK606	FCRK606 ^③	
		100A, 250V	—	—	OFCK661▲	OFCK661▲		
		100A, 600V	—	—	OFCK661▲	OFCK661▲	③	
100	MCS610R or MCS610L	No Fuse	TMK610	TMK610C	—	—	—	#14 to #2/0 AWG Cu/Al
		100A, 250V	—	—	FCK610	FCK610	③	
		100A, 600V	—	—	FCK610	FCK610	③	
		200A, 250V	—	—	OFCK620	OFCK620	③	
		200A, 600V	—	—	OFCK620	OFCK620	③	
200	MCS620R or MCS620L	No Fuse	TMK620	TMK620C▲	—	—	—	#6 to 300 kcmil Cu/Al
		200A, 250V	—	—	FCK620	FCK620	③	
		200A, 600V	—	—	FCK620	FCK620	③	

▲ Built to order. Allow 6-8 weeks for delivery.

① For "copper only" connectors, order as follows:

Fusible—order standard switch, standard fuse kit and copper only no fuse kit.

Non-Fusible—order standard switch and copper only no fuse kit.

② Includes both line and load lugs.

③ For Class R fuses order Class H kit from this table and the Class R conversion kit from the next page.

④ HP ratings for time delay fuses and for 250V DC also apply to Non-fusible switches.

Switches

Disconnect Switches

Type MCS (30-200A)

Auxiliary Switch Kits

Switch Catalog Number	Contact Arrangement	
	1 NO/1 NC Catalog Number	2 NO/2 NC Catalog Number
MCS603R	MCSAKR136	MCSAKR236
MCS603L	MCSAKL136	MCSAKL236▲
MCS606R	MCSAKR136	MCSAKR236
MCS606L	MCSAKL136	MCSAKL236▲
MCS610R	MCSAK116	MCSAK216
MCS610L	MCSAK116	MCSAK216
MCS620R	MCSAK126	MCSAK226
MCS620L	MCSAK126	MCSAK226

Class R Fuse Conversion Kits

Fuse Clip Rating	Catalog Number
100A, 600V	SSRK33
200A, 600V	SSRK34

Fuse Ejector Kits

Switch Catalog Number	Fuse Ejector Kit Catalog Number
MCS610	FE100▲
MCS620	FE200▲

Handle Operators

Fixed Depth, Flange Mounted, Types 1, 3, 3R, 12^{①⑥}

Switch Catalog Number	Complete Handle Mechanism	Handle Only	Switch Operator Only
	Catalog Number	Catalog Number	Catalog Number
MCS603R	FDFS06R	FDH10	FDS06R
MCS603L	FDFS06L	FDH10	FDS06L
MCS606R	FDFS06R	FDH10	FDS06R
MCS606L	FDFS06L	FDH10	FDS06L
MCS610R	FDFS06R	FDH10	FDS06R
MCS610L	FDFS06L	FDH10	FDS06L
MCS620R	FDFS20R	FDH20	FDS20R
MCS620L	FDFS20L	FDH20	FDS20L

Variable Depth, Flange Mounted Max-Flex™, Types 1, 3, 3R, 12^②

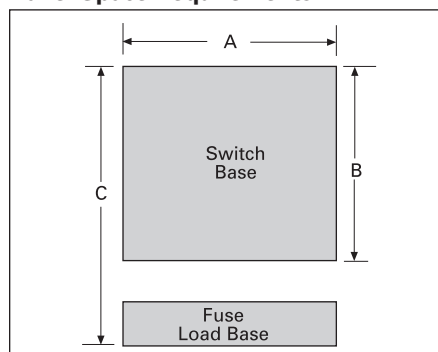
Switch Catalog Number	Complete Handle Mechanism	Handle Only	Switch Operator Only	Cable Only ^③
	Catalog Number	Catalog Number	Catalog Number	Catalog Number
MCS603R	FHOS06036R	FHOHS	FHOS06R	FHOEC036
MCS603L	FHOS06036L	FHOHS	FHOS06L	FHOEC036
MCS606R	FHOS06036R	FHOHS	FHOS06R	FHOEC036
MCS606L	FHOS06036L	FHOHS	FHOS06L	FHOEC036
MCS610R	FHOS06036R	FHOHS	FHOS06R	FHOEC036
MCS610L	FHOS06036L	FHOHS	FHOS06L	FHOEC036
MCS620R	FHOS20036R	FHOHS	FHOS20R	FHOJC036
MCS620L	FHOS20036L	FHOHS	FHOS20L	FHOJC036

Variable Depth Rotary, Through-The-Door-Mounted, Types 1, 12^{④⑤}

Variable Depth				Shaft Only Variable Depth
MCS603R	CRHOS06VD	CRHOH	RHOS06	RHOSVD
MCS606R	CRHOS06VD	CRHOH	RHOS06	RHOSVD
MCS610R	CRHOS06VD	CRHOH	RHOS06	RHOSVD
MCS620R	CRHOS20VD	RHOH	RHOS20	RHOSVD

MCS Disconnect Switch Panel Space Requirements

Panel Space Requirements



- ▲ Built to order. Allow 6-8 weeks for delivery.
^①For Type 4 and 4X applications, order handle only
 Catalog Number 100A - FDH104 200A - FDH204
^②For Type 4 and 4X applications, order handle only
 Catalog Number FHOHS4

Minimum Dimensions (inches*)

Switch Catalog Number	Size	"A"	"B"	"C"	Fuse Class
MCS603	30A/240V	6.13	5.52	8.11	H, K, R
	30A/600V	6.13	5.52	10.11	H, K, R
	30A/600V	6.13	5.52	8.48	J
MCS606	60A/240V	6.13	5.52	7.86	H, K, R
	60A/600V	6.13	5.52	10.38	H, K, R
	60A/600V	6.13	5.52	8.35	J
MCS610	100A/240V	7.38	7.59	11.85	H, K, R
	100A/600V	7.38	7.59	13.85	H, K, R
	100A/600V	7.38	7.59	10.6	J
MCS620	200A/240V	9.17	9.00	14.7	H, K, R
	200A/600V	9.17	9.00	17.2	H, K, R
	200A/600V	9.17	9.00	13.32	J

- ^③Standard cable length is 36 inches. Alternate lengths are available as follows:

Length	Amps	Cat. No.
48"	30-100	FHOEC048
60"	30-100	FHOEC060
48"	200	FHOJC048
60"	200	FHOJC060

- "A" – Dimension is measured from each cross bail pin.
 "B" – Dimension is measured from line side barrier to load side barrier.
 "C" – Dimension is measured from line side terminal of switch to load side terminal of fuse load base.

- ^④For Type 4 and 4X applications, order handle only
 Catalog Number RHOH4

- ^⑤For Type 3 and 3R applications, order handle only
 Catalog Number RHOH

- ^⑥Min. enclosure depth from mounting pan to handle mounting surfaces: 30-100A 6.44 Inches
 200A 10.93 Inches

- *For millimeters multiply inches by 25.4.

Features

- 30 - 800A ratings
- UL Listed under file #E121152 & CSA Certified under file #222227
- Door mounted rotary handles with defeatable cover interlock
- Meets UL requirements for both main and branch circuit applications
- Compact size
- 100kA with Class CC fuses or up to 200kA with Class J fuses
- Load break and horsepower rated
- Quick make and break operation
- All handles are padlockable with up to (3) padlocks with 5/16" hasps in the OFF position

- Catalog number **CFS361C5**, **CFS361J5** and **CNFS361** can be DIN-rail mounted and can be either front or side operated with standard rotary handles.
- All CFS part numbers ending in N can be either front or side operated with standard rotary handles.
- Handles are available in Type 1, 3R, 4/4X & 12 ratings
- NFPA 79 field installed kits are available
- 30-400A, 200kA switches are provided with quick connect terminal provisions for voltage sensing or for 10A max. control circuits
- Fusible switches, 3-pole 600V AC Max. 30-100A & 600-800A switches are also rated 250V DC Max when poles are field connected in series.

Switch



CFS363JN
with (2) **CFS AUX1NO**

Shaft



CFSS10200HN

Handle



CFSH10BL12N

Lugs/Accessories



CFSL200

Ordering information

1. Select the panel mounted switch required based on Ampere, HP and AIC requirements. Switches with a right hand mechanism are standard, 30-100A switches with a left hand mechanism are available.
 2. Select handle based on environmental rating required.
 3. Select operating shaft (200 or 400mm in length). For enclosure depths of 9.0" or less from panel mounting surface to inside of door use 200mm long shafts. For deeper enclosures use 400mm long shafts. 30A 100kA switches can be used in 10" deep enclosures (panel to inside of door) with 200mm shaft and CFSH5N handles.
- Note: Be sure to check shaft and handle compatibility with the switch selected by using information provided in the selection tables.
4. Line & load lugs are provided as standard on 30-100A switches. Terminal kits are available for 200-800A switches if needed.

5. Auxiliary contact are available if needed as follows.
 - A. 30A switch CFS361C5 and non-fusible 30A switch CNFS361 will accept up to (4) aux contacts
 - B. 30A switch CFS361J5 will accept up to (2) aux contacts without an aux contact holder. If more than (2) aux contacts are required order aux contacts PLUS aux contact holder kit CFS AUXH1. All other switches will accept up to (4) aux contacts.
6. If non-fusible switch is required order a shorting bar for 60-600A switches or catalog number CNFS361 for 30A.
7. 30-100A switches are designed to prevent inadvertent contact with live parts and shields are not required. 200 & 400A switches are not supplied with terminal shields. They are available as field installed kits for both line and load terminals. 400-800A switches are supplied as standard with line shields and terminal shroud kits are available for the load side.

Switches

Disconnect Switches

Type CFS Compact Fusible Switches

Fusible switches, 3-pole 600V AC Max. 30-100A & 600-800A switches are also rated 250V DC Max when poles are field connected in series^⑤

Switch ampere rating	Catalog number	Fuse provisions provided	Max horsepower ratings				AC short circuit rating
			240V 3Ø AC	480V 3Ø AC	600V 3Ø AC	250V DC	

Standard – with right hand mounted mechanism

30 ^①	CFS361C5	Class CC	7.5	15	20	5 ^③	100kA
30 ^①	CFS361J5	Class J	7.5	15	20	5 ^③	100kA
30 ^①	CFS361JN	Class J	7.5	15	20	5 ^③	200kA
30 ^①	CNFS361 ^{②④}	None	7.5	15	20	5 ^③	65kA
60 ^①	CFS362JN1	Class J	15	30	50	10 ^③	100kA
60 ^①	CFS362JN	Class J	15	30	50	10 ^③	200kA
100 ^①	CFS363JN		30	60	75	20 ^③	
200 ^②	CFS364JN ^④		60	125	150	–	
400 ^②	CFS365JN ^④		125	250	350	–	
600 ^②	CFS366J ^{⑤⑥}		200	400	500	–	
800 ^②	CFS367L ^{⑤⑥}	Class L	200	400	500	–	200kA

Optional – with left hand mounted mechanism^④

30 ^①	CFS361JLN	Class J	7.5	15	20	5 ^③	200kA
60 ^①	CFS362JLN		15	30	50	10 ^③	
100 ^①	CFS363JLN		30	60	75	20 ^③	

Operating shafts for 30-400A switches^⑤

Catalog number	Shaft length in. (mm)	Switch & handle compatibility
CFSS5200N	7.9 (200)	5mm x 5mm for use with CFS361C5, CFS361J5 & CNFS361 switches & with "CFSH5" handles only
CFSS5400N	15.7 (400)	
CFSS5200HN	7.9 (200)	5mm x 5mm for use with all "CFSH10" handles & with CFS361C5, CFS361J5 & CNFS361 switches only
CFSS5400HN	15.7 (400)	
CFSS10200HN	7.9 (200)	10mm x 10mm for use with all "CFSH10" handles & with all 30-400A switches except CFS361C5, CFS361J5 & CNFS361
CFSS10400HN	15.7 (400)	

Compact rotary operating handles – door mounted (for use with CFS361C5, CFS361J5 & CNFS361 switches only)^⑥

Catalog number	Color	UL Type	Operating shaft compatibility
CFSH5B12N	Blue & Black	1, 3R & 12	CFSS5200N or CFSS5400N
CFSH5R12N	Yellow & Red		
CFSH5B4N	Blue & Black	1, 3R, 12 & 4/4X	
CFSH5R4N	Yellow & Red		

Rotary operating handles - door mounted (for use with CFSS5200HN, CFSS5400HN, CFSS10200HN & CFSS10400HN)

Catalog number	Color	Description
-------------------	-------	-------------

Type 1, 3R & 12^⑦

CFSH10B12N	Blue & Black	Heavy duty pistol grip (2.75" long for use with 30A switches & CFS362JN1)
CFSH10R12N	Yellow & Red	
CFSH10BL12N	Blue & Black	Heavy duty pistol grip (4.92" long for 30-400A switches)
CFSH10RL12N	Yellow & Red	

Type 1, 3R, 4/4X & 12^⑦

CFSH10B4N	Blue & Black	Heavy duty pistol grip (2.75" long for use with 30A switches & CFS362JN1)
CFSH10R4N	Yellow & Red	
CFSH10BL4N	Blue & Black	Heavy duty pistol grip (4.92" long for 30-400A switches)
CFSH10RL4N	Yellow & Red	

① Line and load lugs included.

② Line and load lugs are not included.

Order from table on next page if required.

③ DC HP rating shown requires (3) poles to be connected in series.

④ CFS364JN & CFS365JN can be rotated 180° for left hand operation as standard.

⑤ Catalog numbers CFS361C5, CFS361J5 & CNFS361 accept 5mm x 5mm operating shafts. All other 30-400A switches accept 10mm x 10mm operating shafts.



⑥ Compact pistol grip design (2.75" long) with defeatable cover interlock. Cover can be opened when handle is padlocked in the OFF position.

⑦ Defeatable cover interlock provided. Cover cannot be opened when handle is padlocked in the OFF position.

⑧ Catalog number CNFS361 is a non-fusible switch.

⑨ 4 pole 600 & 800A switches, CFS466J & CFS467L are also available.

⑩ CFS366J and CFS367L are rated 250 & 600V DC when (2) poles are connected in series.

⑪ CNFS361 is rated 65kA when protected by Class J or CC 30A max. fuses.

600 & 800A rotary operating handles - door mounted (8.27" long)^⑦

Catalog number	Color	UL Type
CFSH12BL12	Blue & Black	1, 3R & 12
CFSH12RL12	Yellow & Red	1, 3R & 12
CFSH12BL4	Blue & Black	1, 3R, 12 & 4/4X
CFSH12RL4	Yellow & Red	1, 3R, 12 & 4/4X

600 & 800A operating shafts (cross section 12 x 12 mm)

Catalog number	Shaft length in. (mm)	Enclosure depth (switch mounting surface to door OD)
CFSS12200H	12.59 (320)	10.43 – 16.68 in.
CFSS12400H	15.75 (400)	10.43 – 19.84 in.

Type CFS fusible switch accessories

Catalog number	Description
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Terminals^①

CFSL200	200A lug kit (6 lugs per kit) (1)#6-3/0
CFSL400N	400A lug kit (6 lugs per kit) (1)#2-600kcmil (for CFS365JN only)
CFSL400	600-800A lug kit (6 lugs per kit) (2)#2-600kcmil

Shorting bars (no fuse kits)

CFSSB60	60A shorting bar kit (3 links per kit)
CFSSB100	100A shorting bar kit (3 links per kit)
CFSSB200	200A shorting bar kit (3 links per kit)
CFSSB400	400A shorting bar kit (3 links per kit)
CFSSB680	600 & 800A shorting bar kit (1 link per kit)

Auxiliary contacts (NEMA ratings AC A600 DC N600)

CFSAXH1^②	Aux contact holder (CFS361J5, CFS361C5 & CNFS361)
CFSAX1NO	Aux contact 1 NO (30-800A Sws)
CFSAX1NC	Aux contact 1 NC (30-800A Sws)
CFS11AUX	1NO, 1NC aux contact kit (side mount for 200kA switches)
CFS22AUX	2NO, 2NC aux contact kit (side mount for 200kA switches)

Terminal shrouds (line or load)

CFSTS200N^③	200A shroud kit (line or load 3-pole kit)
CFSTS400N^③	400A shroud kit (line or load 3-pole kit for CFS365JN only)
CFSTS680^③	600/800A 3-pole shroud kit
CFSTS6804^③	600/800A 4-pole shroud kit

30A compact switch kits

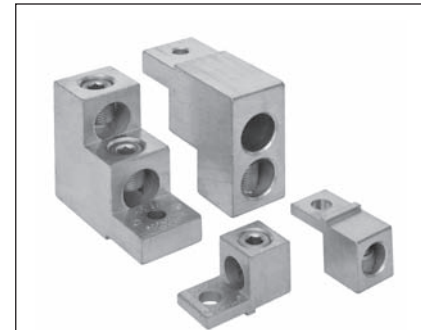
CFSPLK	Shaft padlocking kit for 30A compact switch when door is open ^③
CFSH5CDM	Direct mount handle kit for CFS361C5 & CNFS361
CFSH5JDM	Direct mount handle kit for CFS361J5

NFPA 79 kits

(if auxiliary contacts are needed, see table on page 7)

Kits provide an operating shaft suitable for use with all heavy duty handles (not for use with CFSH5 handles). Kits also provide an internal operating handle and an internal OFF padlocking provision.

CFSNFPA1^④	For use with CFS361C5, CFS361J5 & CNFS361
CFSNFPA2N^⑤	For use with CFS361JN, CFS361CN, CFS362JN1, CFS362JN, CFS363JN & CFS364JN
CFSNFPA3N^⑤	For use with CFS365JN only



CFSL200 & 400



CFSAX1NC



CFSSB100 - CFSSB400

^① Supplied as standard on 30-100A switches

^② CFS361C5 and CNFS361 will accept (4) aux. contacts without an aux contact holder. CFS361J5 will accept (2) aux contacts without an aux contact holder.

^③ Supplied as standard on all but 30A, 65kA & 100kA compact switches.

^④ 12.6 in. (320 mm) long operating shaft included

^⑤ 12.7 in. (323 mm) long operating shaft included

^⑥ Line side terminal shrouds supplied with switch

^⑦ Defeatable cover interlock included. Cover cannot be opened when the handle is padlocked in the OFF position.

^⑧ Neither line or load terminal shrouds are supplied as standard with new style 200 & 400A switches.

Switches

Disconnect Switches

Type CFS Compact Fusible Switches

UL & CSA technical characteristics and panel space requirements

Catalog number	Amps	Fuse Class	AC short circuit rating	Electrical endurance	Mechanical endurance	Panel space requirements - in. (mm)		
						Height	Width	Depth ^①
CFS361C5	30	CC	100kA	6000	10000	4.56 (116)	3.78 (96)	6.00 (152)
CFS361J5	30	J	100kA	6000	10000	4.56 (116)	4.15 (105)	6.00 (152)
CFS361JN	30	J	200kA	6000	10000	5.35 (136)	5.89 (150)	6.00 (152)
CFS361JLN	30	J	200kA	6000	10000	5.35 (136)	5.89 (150)	6.00 (152)
CNFS361	30	None	65kA ^②	6000	10000	4.56 (116)	3.78 (96)	6.00 (152)
CFS362JN1	60	J	100kA	6000	10000	5.35 (136)	5.89 (150)	6.00 (152)
CFS362JN	60	J	200kA	6000	10000	7.32 (186)	5.89 (150)	6.00 (152)
CFS362JLN	60	J	200kA	6000	10000	7.32 (186)	5.89 (150)	6.00 (152)
CFS363JN	100	J	200kA	6000	10000	7.32 (186)	5.89 (150)	6.00 (152)
CFS363JLN	100	J	200kA	6000	10000	7.32 (186)	5.89 (150)	6.00 (152)
CFS364JN	200	J	200kA	6000	8000	11.46 (291)	7.72 (196)	6.00 (152)
CFS365JN	400	J	200kA	1000	6000	15.35 (390)	10.19 (259)	8.00 (203)
CFS366J	600	J	200kA	1000	5000	11.81 (300)	14.33 (364)	11 (280)
CFS466J	600	J	200kA	1000	5000	11.81 (300)	18.03 (458)	11 (280)
CFS367L	800	L	200kA	500	3500	11.81 (300)	14.33 (364)	11 (280)
CFS467L	800	L	200kA	500	3500	11.81 (300)	18.03 (458)	11 (280)

Wire ranges line & load lugs

Switch	Amperage Rating	UL approved wire size (75° C)
CFS361J5	30	(1)#14-10
CFS361C5	30	(1)#14-10
CNFS361	30	(1)#14-10
CFS361JN	30	(1)#14-6
CFS362JN1	60	(1)#14-6
CFS362JN	60	(1)#12-1
CFS363JN	100	(1)#12-1
CFS364JN	200	(1)#3/0
CFS365JN	400	(1)600MCM
CFS366J	600	(2)350 MCM
CFS367L	800	(2)600 MCM

Auxiliary contact capability when an NFPA79 kit is used

Switch	NFPA79 kit	Aux contacts that can be installed
CNFS361	CFSNFPA1	(2) Total, CFS AUX1NO or CFS AUX1NC
CFS361C5		
CFS361J5		
CFS361JN	CFSNFPA2N	(2) Total, CFS AUX1NO or CFS AUX1NC ^③
CFS362JN1		
CFS362JN		
CFS363JN		
CFS364JN		
CFS365JN	CFSNFPA3N	(2) Total, CFS AUX1NO or CFS AUX1NC ^③

① Minimum dimensions from mounting surface to inside of cover. Dimensions shown can be decreased if aux contacts are not required.

② CNFS361 is rated 65kA when protected by 30A max. Class J or CC fuses.

③ For additional auxiliary contacts use side mounted CFS11AUX or CFS22AUX.

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Appendix

Standards and Approvals

UL and CSA file numbers and guide card numbers

Most control equipment listed in this catalog is designed, manufactured and tested in accordance with the relevant UL and CSA standards as listed on pages 19/2 and 19/3.

Equipment	SEC	CSA		UL-listed			UL-recognized		
		Guide No.	File No.	Guide No.	c®	File No.	Guide No.	c®	File No.
3RV motor starter protectors	1	Class 3211 05	LR 12730	NLRV	NLRV7	E 47705	–	–	–
3RV as self-protected controller (Type E)	1	Class 3211 08	LR 12730	NKJH	NKJH7	E 156943	–	–	–
3RV17, 18, 27 & 28 as circuit breakers	1	Class 1432 01	LR 12730	DIVQ	DIVQ7	E 235044	–	–	–
3RA13 & 23 reversing contactors	2	Class 3211 04	LR 12730	NLDX	NLDX7	E 31519	NLDX2	NLDX8	E 31519
3RH control relays	2	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
3RT contactors	2	Class 3211 04	LR 12730	NLDX	NLDX7	E 31519	NLDX2	NLDX8	E 31519
3TB contactors	2	Class 3211 04	LR 12730	NLDX	NLDX7	E 31519	NLDX2	–	E 31519
3TC4 DC Contactors	2	–	–	NLDX	NLDX7	E 31519	–	–	–
3TC5 DC Contactors	2	–	–	NLDX	–	E 31519	–	–	–
3TF6 contactors	2	Class 3211 04	LR 12730	NLDX	NLDX7	E 31519	NLDX2	–	E 31519
3TX7 surge suppressors	2	Class 3211 03	LR 12730	–	–	–	NKCR2	NKCR8	E 31519
3RB20 / 21 solid-state overload relay	3	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
3RB22, 23 & 24 solid-state overload relay	3	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
3RB30 / 31 solid-state overload relay	3	–	–	NKCR	NKCR7	E 44653	–	–	–
3RU11 & 21 thermal overload relay	3	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
3RU21 thermal overload relay	3	–	–	NKCR	NKCR7	E 44653	–	–	–
3UF7 SIMOCODE intelligent overload relay	3	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
3RA*1 & *2 combination starters	4	Class 3211 05	LR12730	NLDX	NLDX7	E 31519	–	–	–
3RA6 compact starter as manual motor controller	4	Class 3211 05	LR 12730	NLRV	NLRV7	E 47705	–	–	–
3RA6 compact starter as self protected controller (Type E)	4	Class 3211 08	LR 12730	NKJH	NKJH7	E 156943	–	–	–
8US1 busbar components	5	–	–	NMTR	NMTR7	E328403	–	–	–
8US1 busbar adapter shoes	5	²⁾	²⁾	–	–	–	NMTR2	NMTR8	E 328403
FB busbar adapter system	5	²⁾	²⁾	–	–	–	NMTR2	NMTR8	E 160776
3RM1 hybrid motor starter	6	–	–	NMFT	NMFT7	E 143112	–	–	–
3RW30 Soft starters	7	Class 3211 06	LR 12730	NMFT	NMFT7	E 143112	–	–	–
3RW30/31 Soft starters	7	Class 3211 06	LR 12730	NMFT	NMFT7	E 143112	–	–	–
3RW40/44 Soft starters	7	Class 3211 06	–	NMFT	NMFT7	E 143112	–	–	–
73 enclosed soft starters	7	–	–	NJAV	NJAV7	E 43399	–	–	–
74 combination soft starters	7	–	–	NJAV	NJAV7	E 43399	–	–	–
3RF20, 21 & 22	8	–	–	NMFT	NMFT7	E 143112	NRNT2	NRNT8	E44653
3RF23 & 24	8	–	–	NRNT	NRNT7	E44653	–	–	–
3RF24 & 34 solid-state contactors	8	Class 3211 07	LR12730	NMFT	–	E 143112	–	–	–
11 manual starters	9	Class 3211	LR 6535	NLVR	NLVR7	E 10590	–	–	–
14, 22, 30, 40, 43 starters & contactors	9	Class 3211	LR 6535	NLDX	NLDX7	E 14900	–	–	–
17, 18, 25, 26, 32 combination starters	9	Class 3211	LR 6535	NKJH	NKJH7	E 185287	–	–	–
36, 37 reduced voltage starters	9	Class 3211	LR 6535	NLDX	NLDX7	E 14900	–	–	–
83, 84, 85, 87, 88 pump control panels	9	Class 3211	LR 6535	NKJH	NKJH7	E 185287	–	–	–
48, 958 overload relays ESP200	9	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
49 field kits	9	Class 3211	ELR 535	NLDX	–	E 14900	NLDX2	–	E 14900
CLM lighting contactors	9	–	–	NRNT	NRNT7	E 27683	–	–	–
LC lighting contactors - open	9	–	–	NLDX	NLDX7	E 14900	–	–	–
LC lighting contactors - enclosed	9	–	–	NRNT	NRNT7	E 27683	–	–	–
LEN00B, C, D, E lighting - open	9	–	–	NLDX	–	E 31519	–	–	–
LEN00F, G, H, lighting - open	9	–	–	NRNT	NRNT7	E 27683	–	–	–
LE lighting contactors - enclosed	9	–	–	NRNT	NRNT7	E 27683	–	–	–
MMS manual switches	9	–	–	NLRV	–	E10590	NLRV2	–	E 10590
SMF manual starters	9	–	–	NLRV	–	E10590	NLRV2	–	E 10590
3SB2 16mm pushbuttons and indicator lights	10	Class 3211 03	LR 12730	–	–	–	NKCR2	–	E 44653
3SB3 22mm pushbuttons and indicator lights	10	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
50 standard duty pilot devices	10	Class 3211	LR 6535	NKCR	NKCR7	E 22655	NKCR2	NKCR8	E 22655
51 hazardous location pilot devices	10	Class 3218	LR 23889	NOIV	NOIV7	E 39935	–	–	–
52 30 mm pilot devices	10	Class 3211	LR 6535	NKCR	NKCR7	E 22655	–	–	–
8WD signal columns	–	–	–	NMTR	NMTR7	E 148698	–	–	–
3RN1 thermistor motor protection	11	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
3RP1 electronic time-delay relay	11	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
3RS10, 11, 20 & 21 temperature monitoring relay	11	–	–	NKCR	NKCR7	E 44653	–	–	–
3RS17 interface converter	11	¹⁾	¹⁾	NKCR	NKCR7	E 44653	–	–	–

¹⁾ c® listing for Canada, instead of CSA certification.

²⁾ c® recognition for Canada, instead of CSA certification.

Appendix

Standards and Approvals

UL and CSA file numbers and guide card numbers On-line resources for Industrial Control products

Equipment	CSA ®	CSA		UL-listed			UL-recognized		
		Guide No.	File No.	Guide No.	c®	File No.	Guide No.	c®	File No.
3RS18 coupling relays	11			NKCR	NKCR7	E 44653			
3TG10 power relay	11	¹⁾	¹⁾	NLDX	NLDX7	E 31519			
3TX70 coupling devices	11	Class 2211 03	LR 12730	NKCR	NKCR7	E 44653	NKCR2	NKCR8	E 44653
3TX71 plug-in relays	11	–	–	–	–	–	NLDX2	NLDX8	E 14900
3TX71 sockets	11	–	–	–	–	–	SWIV2	SWIV8	E 196786
3UG monitoring relay	11	¹⁾	¹⁾	NKCR	NKCR7	E 44653	–	–	–
7PV time-delay relay	11	Class 2211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
8WA1 Terminal blocks	12	–	–	–	–	–	XCFR2	–	E 80027
8WA2 & 8WH Terminal blocks	12	Class 3211	LR50181	–	–	–	XCFR2	XCFR8	E 80027
3SK1 safety relays	13			NKCR	NKCR7	E 44653			
3RK3 MSS	13	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
3SE03 North American NEMA) limit switches	13	–	–	NKCR	–	E 47512	–	–	–
3SE2 hinge switches	13			NKCR	NKCR7	E 44653			
3SE5 limit switches	13	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	NKCR2	NKCR8	E 44653
3SE6 magnetic monitoring system	13			NKCR	NKCR2	E 44653			
3SE7 rope pull switches	13	¹⁾	¹⁾	NKCR	–	E 44653	–	–	–
3SK1 safety relays	13								
3TK28 safety relay	13	¹⁾	¹⁾	NKCR	NKCR7	E 44653	–	–	–
AS-Interface components for control circuits, e.g. AS-Interface modules, gateways	14	Class 3211 03	LR 12730	NKCR	NKCR7	E 44653	–	–	–
AS-Interface components for power circuits, e.g. AS-Interface motor starters, PROFIBUS motor starters	14	Class 3211 04	LR 12730	NLDX	NLDX7	E 31519	–	–	–
6ED1 programmable relays	15			NRAQ	NRAQ7	E 217227			
6EP1 DC power supplies	15	¹⁾	¹⁾	NRAQ	NRAQ7	E 143289	NRAQ2	NRAQ8	E 143289
6GK5 ethernet switches	15			NWGQ	NWGQ7	E 115352			
5SJ4 circuit breakers	16	–	–	DIVQ	DIVQ7	E 243414	–	–	–
5ST Aux switch, fault signal contact, shunt trip, busbar	16	–	–	DIHS	DIHS7	E 321559	DIHS2	DIHS8	E 321559
5SY4 supplementary protectors	16	²⁾	²⁾	–	–	–	QVNU2	QVNU8	E 116386
3NW70 Fuse Holder	16	–	–	–	–	–	IZLT2	IZLT8	E 171267
3NW75 Class CC Fuse Holder	16	–	–	IZLT	IZLT7	E 171267	–	–	–
Sentron circuit breakers	17	Class 1432-01	LR 13077	DIVQ	DIVQ7	E 10848	DKPU2	–	3) E10848
VL circuit breakers	17	Class 1432-01	LR 13077	DIVQ	DIVQ7	E 10848	DKPU2	–	3) E10848
WL circuit breakers	17	–	–	DIVQ	DIVQ7	E 231263	–	–	–
3LD2 disconnect switches	18	¹⁾	230576	NLRV	NLRV7	E 47705	–	–	–
CFS fusible disconnect switches	18	–	222227	WHTY	–	E 121152	WHTY2	–	E 121152
LBR and LBT disconnect switches	18	–	¹⁾	NLRV	–	E 191706	–	–	–
MCS disconnect switches	18	–	154852	–	–	–	WHTY2	–	E 121152
VBL disconnect switches	18	–	154852	–	–	–	WHTY2	–	E 121152
VBL safety switches	18	–	⁴⁾	WIAX	WIAX7	E 4776	–	–	–

¹⁾ c ® listing for Canada, instead of CSA certification.

²⁾ c ® recognition for Canada, instead of CSA certification.

³⁾ Instantaneous only circuit breakers (ETI or MCP).

⁴⁾ CSA labeled SWS available on request.

On-Line Resources for Industrial Control Products

Controls Website

- with links to all sites listed below plus much more

www.usa.siemens.com/controls

Siemens Industrial Controls Catalog

- with updates to the print Catalog

www.usa.siemens.com/iccatalog

Siemens Industry Mall

- Quickly search for Siemens control products
- Configure products for your application
- Create and export a complete Bill of Material for your system
- Find helpful technical information, such as:
 - * Instruction Sheets & Manuals
 - * 2D & 3D Dimension Drawings

www.usa.siemens.com/industrymall

Industrial Control Panels for North America

- Learn the secrets of control panel design
- Improve efficiency in construction and operation of your control panels

www.usa.siemens.com/controlpaneldesign

Short Circuit Current Ratings (SCCR) to meet UL508A & NEC

- Find the latest High Short Circuit testing for combinations of Siemens Power Distribution & Control Products

<http://www.usa.siemens.com/sccr>

Siemens Service and Support Website

- Get answers to technical and application questions
- Receive training on the latest innovations

<http://support.automation.siemens.com/US>

Appendix

General Information

NEMA enclosure descriptions

NEMA Standard Publications

No. 250-1979

Type 1

Type 1 enclosures are intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment in locations where unusual service conditions do not exist. The enclosures shall meet the rod entry and rust resistance design tests.

Type 3

Type 3 enclosures are intended for outdoor use, primarily to provide a degree of protection against wind-blown dust, rain and sleet, and to be undamaged by the formation of ice on the enclosure. They shall meet rain, external icing, dust, and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation or internal icing.

Type 3R

Type 3R enclosures are intended for outdoor use, primarily to provide a degree of protection against falling rain, and to be undamaged by the formation of ice on the enclosure. They shall meet rod entry, rain, external icing, and rust resistance design tests. They are not intended to provide protection against conditions such as dust, internal condensation, or internal icing.

Type 4

Type 4 enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose directed water, and to be undamaged by the formation of ice on the enclosure. They shall meet hosedown, external icing, and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation or internal icing.

Type 4X

Type 4X enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water, and to be undamaged by the formation of ice on the enclosure. They shall meet hose-down, external icing, and corrosion resistance design tests. They are not intended to provide protection against conditions such as internal condensation or internal icing.

Shall be manufactured of American Iron and Steel Institute Type 304 Stainless steel, polymerics, or materials with equivalent corrosion resistance to provide a degree of protection against specific corrosive agents.

Type 6

Type 6 enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against the entry of water during occasional temporary submersion at a limited depth.

Type 6P enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against the entry of water during prolonged submersion at a limited depth.

Type 7

Type 7 enclosures are for indoor use in locations classified as Class I, Groups C or D, as defined in the National Electrical Code.

Type 7 enclosures shall be capable of withstanding the pressures resulting from an internal explosion of specified gases and contain such an explosion sufficiently that an explosive gas-air mixture existing in the atmosphere surrounding the enclosure will not be ignited. Enclosed heat generating devices shall not cause external surfaces to reach temperatures capable of igniting explosive gas-air mixtures in the

surrounding atmosphere. Enclosures shall meet explosion, hydrostatic, and temperature design tests.

Type 9

Type 9 enclosures are intended for indoor use in locations classified as Class II Groups E, F or G, as defined in the National Electrical Code.

Type 9 enclosures shall be capable of preventing the entrance of dust. Enclosed heat generating devices shall not cause external surfaces to reach temperatures capable of igniting or discoloring dust on the enclosure or igniting dust-air mixtures in the surrounding atmosphere. Enclosures shall meet dust penetration and temperature design tests, and aging of gaskets (if used).

Class I—Flammable gases or vapors.

Class II—Combustible dust.

Class III—Ignitable fibers or flyings.

Division I—Normal situation; the hazard would be expected to be present in everyday repair and maintenance.

Division II—Abnormal situation; the material is expected to be confined within closed containers or closed systems and will be present only during accidental rupture, breakage or unusual faulty operation.

Groups

Class I—Gases and vapors are designed for use in groups C and D, depending on the ignition temperature of the substance, its explosion pressure and other flammable characteristics.

Class II—Dust locations are designed for use in groups E, F, and G, according to the ignition temperature and conductivity of the hazardous substance.

Type 12

Type 12 enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquids. They shall meet drip, dust, and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation.

Siemens NEMA 12 may be field modified for outdoor use. NEMA 3 requires the use of watertight conduit hubs. NEMA 3R requires the use of watertight conduit hubs at a level above the lowest live part and drain holes of 1/8" diameter shall be added at the bottom of the enclosure.

Type 13

Type 13 enclosures are intended for indoor use primarily to provide a degree of protection against dust, spraying of water, oil and non-corrosive coolant. They shall meet oil explosion and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation.



Type 1



Type 3/3R



Type 4/4X



Type 4X



Type 3, 4, 7 & 9



Type 12 & 13

Comparison of NEMA Enclosures

This table summarizes the information provided on the previous page.

Provides a Degree of Protection Against the Following Environmental Conditions	1	3R	4	4X	12	13
Incidental contact with the enclosed equipment	X	X	X	X	X	X
Rain, snow, and sleet	—	X	X	X	—	—
Windblown dust	—	—	X	X	—	—
Falling dirt	X	—	X	X	X	X
Falling liquids and light splashing	—	—	X	X	X	X
Circulating dust, lint, fibers, and flyings	—	—	X	X	X	X
Settling airborne dust, lint, fibers, and flyings	—	—	X	X	X	X
Hosedown and splashing water	—	—	X	X	—	—
Oil and coolant seepage	—	—	—	—	X	X
Oil or coolant spraying and splashing	—	—	—	—	—	X
Corrosive agents	—	—	—	X	—	—

IEC Environmental Enclosure Ratings for Global Applications

IEC enclosures use a two digit numbering system to define the degree of protection they provide. The first digit specifies the degree of protection against incidental contact and penetration of solid objects. The second digit specifies the level of protection against the ingress of water.

Example: An IP65 enclosure is dust tight and protected against water jets. An IP66 enclosure is dust tight and protected against powerful water jets.

First Numeral	Second Numeral
Protection of persons against access to hazardous parts and protection against penetration of solid foreign objects.	Protection against ingress of water under test conditions specified in IEC 529.
0 Non-protected	0 Non-protected
1 Back of hand; objects greater than 50 mm in diameter	1 Vertically falling drops of water
2 Finger; objects greater than 12.5 mm in diameter	2 Vertically falling drops of water with enclosure tilted 15 degrees
3 Tools or objects greater than 2.5 mm in diameter	3 Spraying water
4 Tools or objects greater than 1 mm in diameter	4 Splashing water
5 Dust-protected (Dust may enter but must not interfere with operation of the equipment or impair safety)	5 Water jets
6 Dust tight (No dust observable inside enclosure at end of test)	6 Powerful water jets
	7 Temporary submersion
	8 Continuous submersion

Comparison of NEMA Type Numbers to IEC Classification Designations

This table shows the IP classification designation to which NEMA enclosures may be applied. The table cannot be used to convert IEC designations to NEMA type numbers.

NEMA Enclosure Type Number	IEC Enclosure Classification Designation
1	IP10
3	IP54
3R	IP54
4 and 4X	IP56
6 and 6P	IP67
12	IP52
13	IP54

Appendix

General Information

IEC contactor utilization categories

Contactors designed for international applications are tested and rated per IEC 947-4. The IEC rating system is broken down into different utilization categories that define the value of the current that the contactor must make, maintain, and break. The following category definitions are the most commonly used for IEC Contactors.

Ratings for Siemens contactors per these categories can be found in Section 3.

AC Categories

AC-1

This applies to all AC loads where the power factor is at least 0.95. These are primarily non-inductive or slightly inductive loads. Breaking remains easy.

AC-3

This category applies to squirrel cage motors where the breaking of the power contacts would occur while the motor is running. On closing, the contactor experiences an inrush which is 5 to 8 times the nominal motor current, and at this instant, the voltage at the terminals is approximately 20% of the line voltage. Breaking remains easy.

AC-4

This applies to the starting and breaking of a squirrel cage motor during an inch or plug reverse. On energization, the contactor closes on an inrush current approximately 5 to 8 times the nominal current. On de-energization, the contactor breaks the same magnitude of nominal current at a voltage that can be equal to the supply voltage. Breaking is severe.

DC Categories

DC-1

This applies to all DC loads where the time constant (L/R) is less than or equal to one msec. These are primarily noninductive or slightly inductive loads.

DC-2

This applies to the breaking of shunt motors while they are running. On closing, the contactor makes the inrush current around 2.5 times the nominal rated current. Breaking is easy.

DC-3

This applies to the starting and breaking of a shunt motor during inching or plugging. The time constant shall be less than or equal to 2 msec. On energization, the contactor sees current similar to that in Category DC-2. On de-energization, the contactor

will break around 2.5 times the starting current at a voltage that may be higher than the line voltage. This would occur when the speed of the motor is low because the back e.m.f. is low. Breaking is severe.

DC-5

This applies to the starting and breaking of a series motor during inching or plugging. The time constant being less than or equal to 7.5 msec. On energization, the contactor sees about 2.5 times the nominal full load current. On de-energization, the contactor breaks the same amount of current at a voltage which can be equal to the line voltage. Breaking is severe.

Special Contactor Utilization Categories

Some contactors also have ratings for the following specialty utilization categories.

For specific applications, please contact your local Siemens sales office.

Kind of Current	Utilization Categories	Typical Applications
AC	AC-2	Slip-ring motors: starting, switching off
	AC-5a	Switching of electric discharge lamp controls
	AC-5b	Switching of incandescent lamps
	AC-6a	Switching of transformers, welders
	AC-6b	Switching of capacitor banks
	AC-7a	Slightly inductive loads in household appliances and similar applications
	AC-7b	Motor-loads for household applications
	AC-8a	Hermetic refrigerant compressor motor ¹⁾ control with manual resetting of overload releases
DC	AC-8b	Hermetic refrigerant compressor motor ¹⁾ control with automatic resetting of overload releases
	DC-6	Switching of incandescent lamps

Electrical Quantities Symbols According to DIN, VDE and IEC

Symbol	Characteristic Electrical Quantity	Symbol	Characteristic Electrical Quantity
U_i	Rated insulation voltage to DIN VDE 0110/DIN VDE 0660	I_{cw}	Rated short-time current withstand capacity to IEC 947-1
U_e	Rated operational voltage	I_D	Test current (general) to DIN VDE 0660, prospective current to DIN VDE 0636
U_c	Rated control voltage (IEC 947-1) at which an operating mechanism or release is rated, e.g. coil voltage to DIN VDE 0660 Part 102	I_n	Breaking current (r.m.s. value) to DIN VDE 0102
U_s	Rated control supply voltage (Control voltage) to DIN VDE 0660 Part 102, IEC 947-1	i_p	Peak short-circuit current (maximum instantaneous value) to DIN VDE 0102
U_0	No-load voltage to IEC 947-2, -3, -5	I_k	Sustained (symmetrical) short-circuit current (r.m.s. value), DIN VDE 0102.
U_r	Power-frequency recovery voltage (IEC 947-.)		Rated short-time withstand current to DIN VDE 0660
U_o	Transformer no-load voltage to DIN VDE 0532	i_p	Let-through current of fuses and rapidly operating switching devices (maximum instantaneous value during the break time) to DIN VDE 0102
U_k	Short-circuit impedance voltage to DIN VDE 0532	I_o	No-load current at the input side of a transformer (unloaded output side) to DIN VDE 0532
U_{kr}	Rated value of the impedance voltage in % to DIN VDE 0102, 01.90		
I_n	Rated current to IEC 947-.	I_x	Current carrying capacity (ampacity)
I_{th}	Eight-hour-current to DIN VDE 0660, conventional free-air thermal current to IEC 947- (defined as eight-hour-current) thermally equivalent short-time current (r.m.s. value) to DIN VDE 0103	I_{sr}	Rated rotor operational current (DIN VDE 0660, IEC 947-1)
I_{the}	Conventional enclosed thermal current	I_r	Setting current ("current setting") to DIN VDE 0660
I_u	Rated uninterrupted current to IEC 947-1	I_B	Take-over current
I_e	Rated operational current	R	Ohmic resistance
I_s	Selectivity (discrimination) limit current (DIN VDE 0660, IEC 947-1)	S''_k	Initial symmetrical AC short-circuit power (simplified: apparent short-circuit power)
I_{cm}	Rated short-circuit making capacity to IEC 947-1	X	Reactance, reactive impedance
I_{cn}	Rated short-circuit breaking capacity to IEC 947-1	Z	Impedance (apparent resistance)
I_{cm}	Rated ultimate short-circuit breaking capacity to IEC 947-1	x	Factor to determine the peak short-circuit current ip

1) Hermetic refrigerant compressor motor is a combination consisting of a compressor and a motor, both of which are enclosed in the same housing, with no external shaft or shaft seals, the motor operating in the refrigerant.

NEMA and IEC control circuit classifications

AC-Control Circuit Classifications—NEMA

NEMA designates Control Circuit Rating with a code letter (for current) and a voltage code.

Ratings & Test Values for AC Control Circuit Contacts at 50 or 60Hz

Contact Rating	Thermal Continuous Test Current, Amperes	Maximum Current, Amperes								Voltamperes	
		120 Volts		240 Volts		480 Volts		600 Volts			
Designation	Amperes	Make	Break	Make	Break	Make	Break	Make	Break	Make	Break
A150	10	60	6	—	—	—	—	—	—	7200	720
A300	10	60	6	30	3	—	—	—	—	7200	720
A600	10	60	6	30	3	15	1.5	12	1.2	7200	720
B150	5	30	3	—	—	—	—	—	—	3600	360
B300	5	30	3	15	1.5	—	—	—	—	3600	360
B600	5	30	3	15	1.5	7.5	0.75	6	0.6	3600	360
C150	2.5	15	1.5	—	—	—	—	—	—	1800	180
C300	2.5	15	1.5	7.5	0.75	—	—	—	—	1800	180
C600	2.5	15	1.5	7.5	0.75	3.75	0.375	3	0.3	1800	180
D150	1	3.6	0.6	—	—	—	—	—	—	432	72
D300	1	3.6	0.6	1.8	0.3	—	—	—	—	432	72
E150	0.5	1.8	0.3	—	—	—	—	—	—	216	36

DC-Control Circuit Classifications—NEMA

Rating codes for DC Control Circuit Contacts

Contact Rating Designation ¹⁾	Thermal Continuous Test Current, Amperes	Maximum Make or Break ²⁾ Current, Amperes			Maximum Make or Break Voltamperes at 300 Volts or Less
		125 Volt	250 Volt	301 to 600 Volt	
N150	10	2.2	—	—	275
N300	10	2.2	1.1	—	275
N600	10	2.2	1.1	0.4	275
P150	5	1.1	—	—	138
P300	5	1.1	0.55	—	138
P600	5	1.1	0.55	0.2	138
Q150	2.5	0.55	—	—	69
Q300	2.5	0.55	0.27	—	69
Q600	2.5	0.55	0.27	0.1	69
R150	1	0.22	—	—	28
R300	1	0.22	0.11	—	28

Control Circuit Classifications—IEC³⁾

IEC 947-5-1 Uses Utilization Categories AC-15 to Specify Control Circuit Ranges.

Current at each voltage is specified by the manufacturer, not by the standard.

AC Control Circuit Utilization Categories per IEC 947-5-1	Make		Break		DC Control Circuit Utilization Categories per IEC 947-5-1	Make		Break	
	I _o	U _o	I _o	U _o		I _o	U _o	I _o	U _o
AC-12	1	1	1	1	DC-12	1	1	1	1
AC-13	2	1	1	1	DC-13	1	1	1	1
AC-14	6	1	1	1	DC-14	10	1	1	1
AC-15	10	1	1	1					

Example of a Typical IEC Control Circuit Ratings Table⁴⁾

AC				DC		
I _o /AC-12 (Continuous Amps)	U _o AC Voltage	I _o /AC-15 Amps		Voltage	I _o /DC-12	I _o /DC-13
10	24V	6A		24	6A	3A
	110V	6A		60	5A	1.5A
	220/230V	6A		110	2.5A	0.7A
	380/440V	4A		230	1A	0.3A

1)The numerical suffix designates the maximum voltage design values, which are to be 600, 300, and 150 volts for suffixes 600, 300, and 150 respectively. Test voltage shall be 600, 250, or 125 volts. MLLDLL.

2)For maximum ratings at 300 volts or less, the maximum make and break ratings are to be obtained by dividing the volt-ampere rating by the application voltage, but the current value is not to exceed the thermal continuous test current.

3) I_o Rated operational current
U_o Rated operational voltage
I Current to be made or broken
U Voltage before make

4)Example: A control circuit contact having an AC-15 rating of 6 amps at 230 volts is capable of making 60 amps and breaking 6 amps at 230 volts. KRE.

Appendix

General Information

Ampere ratings for 3 phase AC induction motors

3 Phase

Amperes 60Hz

Hp	Syn Speed RPM	200 Volts	230 Volts	460 Volts	575 Volts
¼	1800	1.09	0.95	0.48	0.38
	1200	1.61	1.40	0.70	0.56
	900	1.84	1.60	0.80	0.64
⅓	1800	1.37	1.19	0.60	0.48
	1200	1.83	1.59	0.80	0.64
	900	2.07	1.80	0.90	0.72
½	1800	1.98	1.72	0.86	0.69
	1200	2.47	2.15	1.08	0.86
	900	2.74	2.38	1.19	0.95
¾	1800	2.83	2.46	1.23	0.98
	1200	3.36	2.82	1.46	1.17
	900	3.75	3.26	1.63	1.30
1	3600	3.22	2.80	1.40	1.12
	1800	4.09	3.56	1.78	1.42
	1200	4.32	3.76	1.88	1.50
	900	4.95	4.30	2.15	1.72
1 ½	3600	5.01	4.36	2.18	1.74
	1800	5.59	4.86	2.43	1.94
	1200	6.07	5.28	2.64	2.11
	900	6.44	5.60	2.80	2.24
2	3600	6.44	5.60	2.80	2.24
	1800	7.36	6.40	3.20	2.56
	1200	7.87	6.84	3.42	2.74
	900	9.09	7.90	3.95	3.16
3	3600	9.59	8.34	4.17	3.34
	1800	10.8	9.40	4.70	3.76
	1200	11.7	10.2	5.12	4.10
	900	13.1	11.4	5.70	4.55
5	3600	15.5	13.5	5.76	5.41
	1800	16.6	14.4	7.21	5.78
	1200	18.2	15.8	7.91	6.32
	900	18.3	15.9	7.92	6.33
7 ½	3600	22.4	19.5	9.79	7.81
	1800	24.7	21.5	10.7	8.55
	1200	25.1	21.8	10.9	8.70
	900	26.5	23.0	11.5	9.19
10	3600	29.2	25.4	12.7	10.1
	1800	30.8	25.8	13.4	10.7
	1200	32.2	28.0	14.0	11.2
	900	35.1	30.5	15.2	12.2
15	3600	41.9	36.4	18.2	14.5
	1800	45.1	39.2	19.6	15.7
	1200	47.6	41.4	20.7	16.5
	900	51.2	44.5	22.2	17.8
20	3600	58.0	50.4	25.2	20.1
	1800	58.9	51.2	25.6	20.5
	1200	60.7	52.8	26.4	21.1
	900	63.1	54.9	27.4	21.9

Amperes 60Hz

Hp	Syn Speed RPM	200 Volts	230 Volts	460 Volts	575 Volts
25	3600	69.9	60.8	30.4	24.3
	1800	74.5	64.8	32.4	25.9
	1200	75.4	65.6	32.8	26.2
	900	77.4	67.3	33.7	27.0
30	3600	84.8	73.7	36.8	29.4
	1800	86.9	75.6	37.8	30.2
	1200	90.6	78.8	39.4	31.5
	900	94.1	81.8	40.9	32.7
40	3600	111	96.4	48.2	38.5
	1800	116	101	50.4	40.3
	1200	117	102	50.6	40.4
	900	121	105	52.2	41.7
50	3600	138	120	60.1	48.2
	1800	143	124	62.2	49.7
	1200	145	126	63.0	50.4
	900	150	130	65.0	52.0
60	3600	164	143	71.7	57.3
	1800	171	149	74.5	59.4
	1200	173	150	75.0	60.0
	900	177	154	77.0	61.5
75	3600	206	179	89.6	71.7
	1800	210	183	91.6	73.2
	1200	212	184	92.0	73.5
	900	222	193	96.5	77.5
100	3600	266	231	115	92.2
	1800	271	236	118	94.8
	1200	275	239	120	95.6
	900	290	252	126	101
125	3600	—	292	146	116
	1800	—	293	147	117
	1200	—	298	149	119
	900	—	305	153	122
150	3600	—	343	171	137
	1800	—	348	174	139
	1200	—	350	174	139
	900	—	365	183	146
200	3600	—	458	229	184
	1800	—	452	226	181
	1200	—	460	230	184
	900	—	482	241	193
250	3600	—	559	279	223
	1800	—	568	284	227
	1200	—	573	287	229
	900	—	600	300	240
300	1800	—	278	339	271
	1200	—	684	342	274
400	1800	—	896	448	358

Full load ampere ratings of motors vary depending upon a number of factors. The full load currents listed above are “average values” for horsepower rated motors of several manufacturers at the most commonly rated voltages and speeds. These “average values” along with the similar values listed in the N.E.C. should be used as a guide only for selecting suitable components for the motor branch circuit. The rated full load current shown on the motor nameplate

may vary considerably from the listed value, depending on the specified motor design.

Note: RPM shown for 60Hz motors. For 50Hz motors, multiply the 60Hz FLA value by 1.2.

Overload Relay Selection Multi-Speed/Part-Winding/Wye-Delta

Special attention should be given to the selection of the overload relay adjustment range for multi-speed, part-winding and wye-delta controllers, as follows:

Multi-Speed Controllers: Each speed requires a separate set of overloads. The adjustment range must be selected on the basis of the full-load current for each particular speed.

Part-Winding Controllers: Each winding of the motor must have its own set of overloads. The adjustment range should be selected on the basis of one-half the motor full-load current; that is, the full load current of each winding current.

Wye-Delta Controllers: Only one set of overloads is required. Since the overload relay is located electrically “inside the delta connection,” the adjustment range must be selected on the basis of the full-load motor current (delta connection) divided by 1.73.

Single Phase: See page 9/120 for ampere ratings of single phase AC induction motors.

Wire Conversion Table

Other Conversions

Comparison of Cross-sectional Areas to Metric and US Standards

Metric Cross-sectional Areas (in line with VDE)		American Wire Gauge	
Cross-sectional Area mm ²		Equivalent Metric C.S.A. mm ²	AWG or MCM
0.75		0.635	19 AWG
		0.823	18
		1.04	17
1.5		1.31	16
		1.65	15
		2.08	14
2.5		2.62	13
		3.31	12
4		4.17	11
		5.26	10
6		6.63	9
		8.37	8
10		10.55	7
		13.30	6
16		16.77	5
		21.15	4
25		26.67	3
		33.63	2
35		42.41	1
		53.48	1/0
70		67.43	2/0
		85.03	3/0
120		107.20	4/0
		126.64	250 MCM
150		152.00	300
		177.35	350
185		202.71	400
		253.35	500
240		304.00	600
		354.71	700
400		405.35	800
		506.71	1000
500			
625			

Power Conversions		
1 kilowatt (kW)	=	1.341 horsepower (hp)
1 horsepower (hp)	=	0.7457 kilowatt (kW)
Dimensions Conversions		
1 inch (in.)	=	25.4 millimeters (mm)
1 inch (in.)	=	2.54 centimeters (cm)
1 centimeter (cm)	=	0.3937 inches (in.)
1 meter (m)	=	39.37 inches (in.)
Weight Conversions		
1 ounce (oz.)	=	28.35 grams (g)
1 pound (lb.)	=	0.454 kilograms (kg)
1 kilogram (kg)	=	2.205 pounds (lbs.)
Temperature Conversions		
100 Celsius	=	212 Fahrenheit
80 Celsius	=	176 Fahrenheit
60 Celsius	=	140 Fahrenheit
40 Celsius	=	104 Fahrenheit
20 Celsius	=	68 Fahrenheit
0 Celsius	=	32 Fahrenheit
Torque		
1 Newton-meter (Nm)	=	8.85 pound-inches (lb. in.)

Appendix

General Information

Electrical formulas and grounding requirements

Electrical Formulas for Finding Amperes, Horsepower, Kilowatts and kVA

To Find	Single-Phase	Alternating Current Two-Phase ¹⁾ , Four-Wire	Three-Phase	Direct Current
Kilowatts	$\frac{I \times E \times pf}{1000}$	$\frac{I \times E \times 2 \times pf}{1000}$	$\frac{I \times E \times 1.73 \times pf}{1000}$	$\frac{I \times E}{1000}$
kVA	$\frac{I \times E}{1000}$	$\frac{I \times E \times 2}{1000}$	$\frac{I \times E \times 1.73}{1000}$	—
Horsepower (Output)	$\frac{I \times E \times \% \text{ EFF} \times pf}{746}$	$\frac{I \times E \times 2 \times \% \text{ EFF} \times pf}{746}$	$\frac{I \times E \times 1.73 \times \% \text{ EFF} \times pf}{746}$	$\frac{I \times E \times \% \text{ EFF}}{746}$
Amperes when Horsepower is Known	$\frac{HP \times 746}{E \times \% \text{ EFF} \times pf}$	$\frac{HP \times 746}{2 \times E \times \% \text{ EFF} \times pf}$	$\frac{HP \times 746}{1.73 \times E \times \% \text{ EFF} \times pf}$	$\frac{HP \times 746}{E \times \% \text{ EFF}}$
Amperes when Kilowatts is Known	$\frac{KW \times 1000}{E \times pf}$	$\frac{KW \times 1000}{2 \times E \times pf}$	$\frac{KW \times 1000}{1.73 \times E \times pf}$	$\frac{KW \times 1000}{E}$
Amperes when kVA is Known	$\frac{kVA \times 1000}{E}$	$\frac{kVA \times 1000}{2 \times E}$	$\frac{kVA \times 1000}{1.73 \times E}$	—

Average Efficiency and Power Factor Values of Motors

When the actual efficiencies and power factors of the motors to be controlled are not known, the following approximations may be used.

Efficiencies³⁾

Type	Power Factor
DC motors, 35 horsepower and less	80% to 85%
DC motors, above 35 horsepower	85% to 90%
Synchronous motors (at 100% power factor)	92% to 95%
"Apparent" Efficiencies (= Efficiency × Power Factor); Three-phase induction motors, 25 horsepower and less	70%
Three-phase induction motors above 25 horsepower	80%

Fault-Current Calculation on Low-Voltage AC Systems

In order to determine the maximum interrupting rate of the circuit breakers in a distribution system, it is necessary to calculate the current which could flow under a three-phase bolted short circuit condition. For a three-phase system the maximum available fault current at the secondary side of the transformer can be obtained by use of the formula:

$$I_{SC} = \frac{kVA \times 100}{KV \times \sqrt{3} \times \% Z}$$

where:

I_{SC} = Symmetrical RMS amperes of fault current.

kVA = Kilovolt-ampere rating of transformers.

KV = Secondary voltage in kilovolts.

% Z = Percent impedance of primary line and transformer.

Minimum Size Grounding Conductors for Grounding Raceways and Equipment (From NEC Table 250-95)²⁾

Rating or Setting of Automatic Overcurrent Device in Circuit Ahead of Equipment, Conduit etc., Not Exceeding (Amperes)	Size	
	Copper Wire Number	Aluminum or Copper Clad Aluminum Wire Number
15	14	12
20	12	10
30	10	8
40	10	8
60	10	8
100	8	6
200	6	4
300	4	2
400	3	1
500	2	1/0
600	1	2/0
800	1/0	3/0
1000	2/0	4/0
1200	3/0	250 kcmil
1600	4/0	350 kcmil
2000	250 kcmil	400 kcmil
2500	350 kcmil	600 kcmil
3000	400 kcmil	600 kcmil
4000	500 kcmil	800 kcmil
5000	700 kcmil	1200 kcmil
6000	800 kcmil	1200 kcmil

Grounding Electrode Conductor for AC Systems (From NEC Table 250-94)²⁾

Size of Largest Service Entrance Conductor or Equivalent Area for Parallel Conductors		Size of Grounding Electrode Conductor	
Copper	Aluminum or Copper Clad Aluminum	Copper	Aluminum or Copper Clad Aluminum
2 or smaller	1/0 or smaller	8	6
1 or 1/0	2/0 or 3/0	6	4
2/0 or 3/0	4/0 or 250 kcmil	4	2
Over 3/0 to 350 kcmil	Over 250 kcmil to 500 kcmil	2	1/0
Over 350 kcmil to 600 kcmil	Over 500 kcmil to 900 kcmil	1/0	3/0
Over 600 kcmil to 1100 kcmil	Over 900 kcmil to 1750 kcmil	2/0	4/0
Over 1100 kcmil	Over 1750 kcmil	3/0	250 kcmil

1) In three-wire, two-phase circuits the current in the common conductor is 1.41 times that in either other conductor.

E = Volts I = Amperes

% EFF = Percent Efficiency pf = Power Factor

2) Additional information and exceptions are stated in Article 250—Grounding, National Electric Code.

3) These figures may be decreased slightly for single-phase and two-phase induction motors.

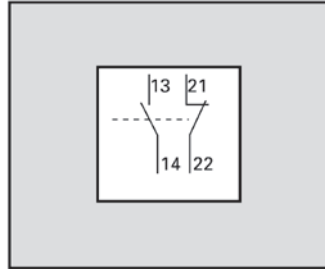
Symbols and Terminal Markings—IEC

Per DIN standards, the terminals of auxiliary contacts on contactors and control devices are marked with a two digit number. Terminals that belong together are marked with the same location digit (first digit).

The second digits (called the function digits) identify the function of each contact per the following designation.

Type of Contact	Function Digits
Normally Open	3 and 4
Normally Closed	1 and 2
Normally Open (Special Function)	5 and 6 i.e. Time-Delay or Overload
Normally Closed (Special Function)	7 and 8 Contacts

Example:



1. The numbers 13 and 14 represent an auxiliary contact
2. The number 1 identifies that this is the first contact in the sequence
3. The numbers 3 and 4 identify this as a normally open contact
4. The numbers 21 and 22 represent another auxiliary contact
5. The number 2 identifies that this is the second contact in the sequence
6. The numbers 1 and 2 identify this as a normally closed contact

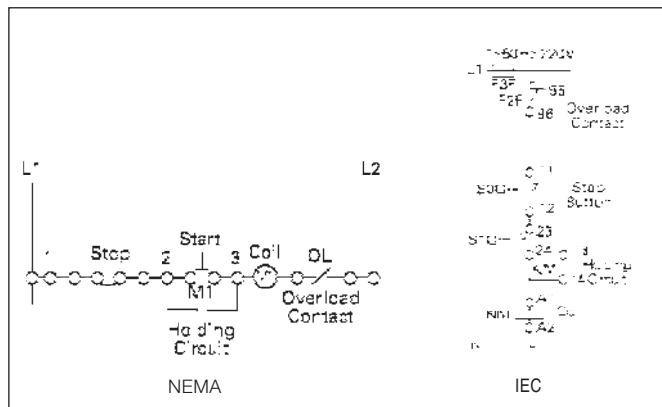
Symbols and Terminal Markings

Control Circuits	NEMA	IEC
Normally Open (NO)		
Normally Closed (NC)		
Time Delay Circuits		
On Delay Normally Open (Timed Closed)		
Normally Closed (Timed Open)		
Off Delay Normally Open (Timed Open)		
Normally Closed (Timed Closed)		

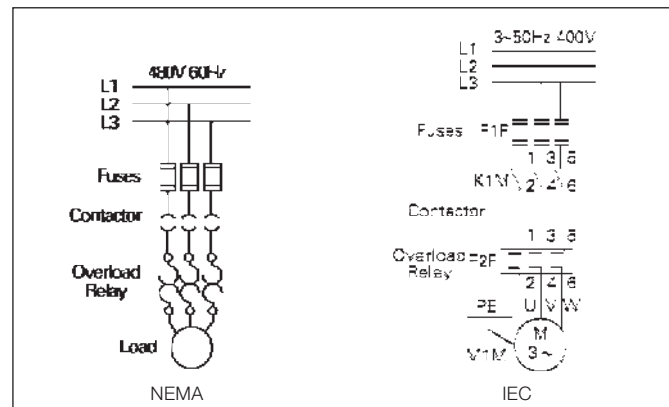
NEMA and IEC Comparisons Contactor/Starter Markings

	NEMA		IEC
Coils		M — Defined by type of coil. No Standard terminal designation.	
Power Contacts 3-Pole Device		Line Side Connections	
		Load Side Connections	
Overload Relay		Line Side Connections	
		Load Side Connections	

Control Circuit Schematic



Power Circuit Schematic



Appendix

General Information

Electrical symbols

Disconnect 	Circuit Interrupter 	Circuit Breaker Thermal 	Limit Switch—Spring Return Normally Open Normally Closed Held Closed Held Open 		Neutral Position NP NP 	Maintained
Liquid Level Normally Open Normally Closed 		Vacuum & Pressure Normally Open Normally Closed 		Temperature Activated Normally Open Normally Closed 		Flow (Air, Water, etc.) Normally Open Normally Closed
Push Buttons Normally Open Normally Closed Double Circuit Mushroom Head Maintained 			Foot Switch Normally Open Normally Closed 			
Selector Switch J-K-L A1 A2 B1 B2 x Indicates Contacts Closed		Lamps PUSH TO TEST Denote Lens Color by Letter 		Time Delay Contact Normally Open Normally Open Normally Closed Normally Closed 		
General Contacts Normally Open Normally Closed 		Conductors Not Connected Connected 		Magnet Coil 	Control Transformer H1 H3 H2 H4 X2 X1	Meter VM AM
Ground 	Full Wave Rectifier AC DC DC AC	Horn, Siren 	Bell, Buzzer 	Motor 3 Phase Motor	Overload Relay Thermal 	Fuse
Auto Transformer 		Resistor Adjustable Fixed 		Location of Relay Contacts ICR (2 - 3 - 4) Numbers in parentheses designate the location of relay contacts. A line underneath a location number signifies a normally closed contact.		

Figure 1 Three Wire Control Giving Low Voltage Protection Using Single Two Button Station

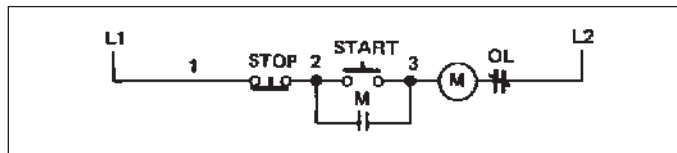


Figure 2 Three Wire Control Giving Low Voltage Protection Using Multiple Two Button Stations

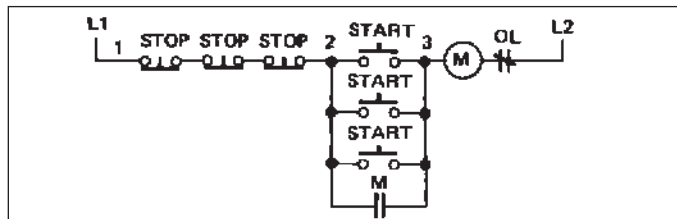


Figure 3 Three Wire Control Giving Low Voltage Protection with Safe-Run Selector Switch

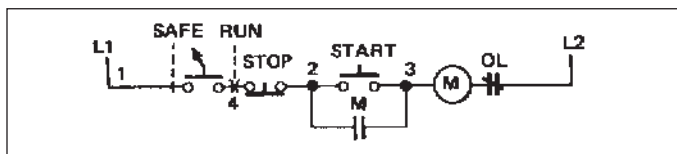


Figure 4 Three Wire Control for Jog or Run Using Start Stop Push Buttons and Jog-Run Selector Switch

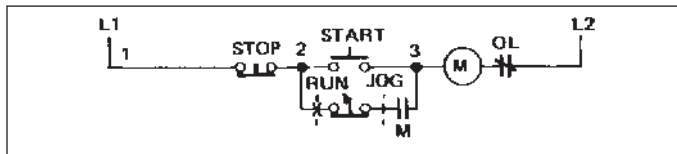


Figure 5 Control for Jog or Run Using Stop Push Button and Jog-Run Selector Push Selector Switch. Selector Push Contacts are Shown for "Run" (Three Wire Operation). Rotate Switch Sleeve and Selector Contact Opens Between "2" and "Stop" Button (Two Wire Operation)

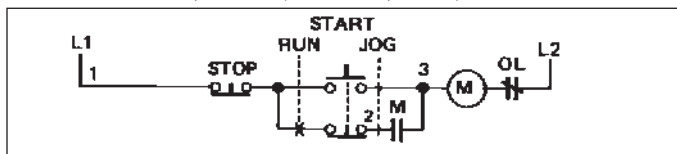


Figure 6 Three Wire Control for Jogging, Start, Stop Using Push Buttons

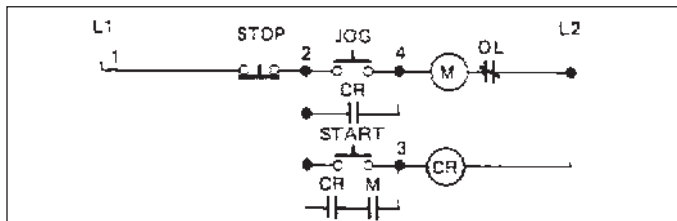


Figure 7 Two Wire Control Giving Low Voltage Release Only Using Hand-Off-Auto Selector Switch

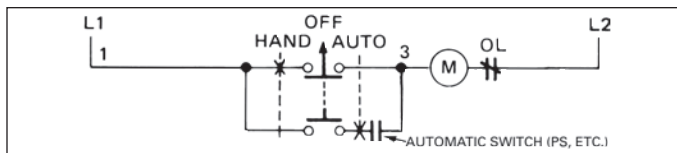


Figure 8 Two Wire Control for Reversing Jogging Using Single Two Button Station

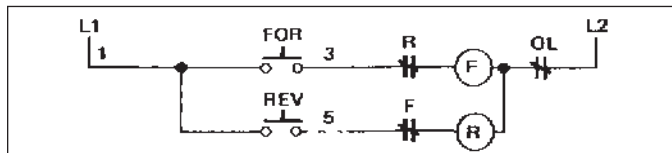


Figure 9 Three Wire Control for Instant Reversing Applications Using Single Three Button Station

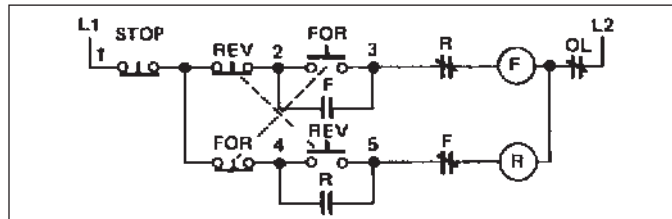


Figure 10 Three Wire Control for Reversing After Stop Using Single Three Button Station

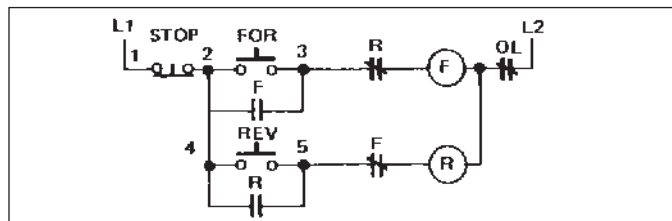


Figure 11 Control for Three Speed with Selective Circuitry to Insure the Stop Button is Pressed Before Going to a Lower Speed

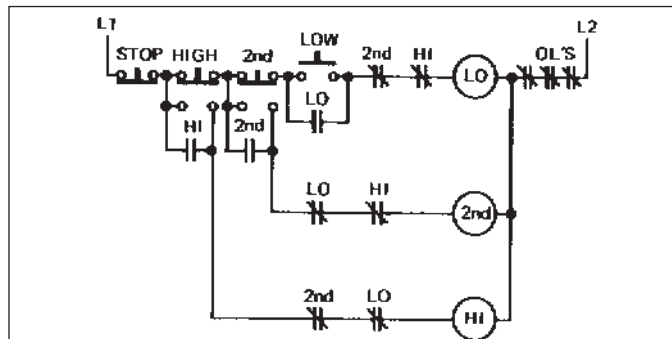
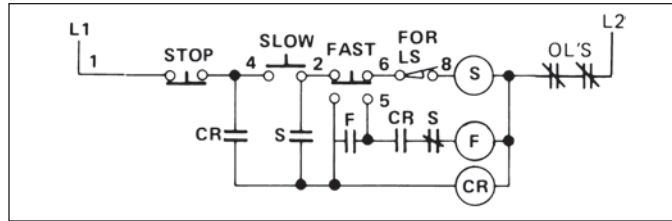


Figure 12 Three Wire Control for Two Speed with a Compelling Relay to Insure Starting on Slow Speed



Appendix

General Information

Control circuit schematics and wiring diagrams with transformers

Figure 13 Control for Three Speed with a Compelling Relay to Insure Starting on Low Speed

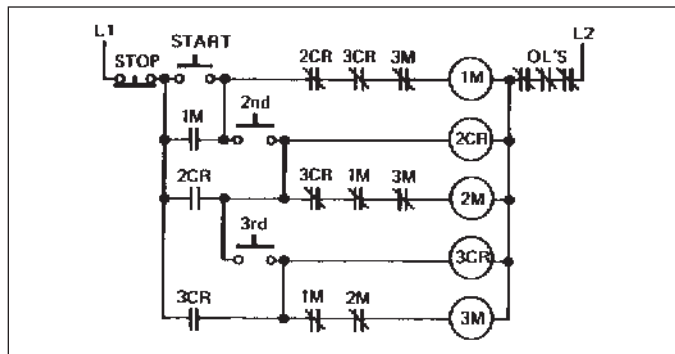


Figure 14 Control for Two Speed to Provide Automatic Acceleration from Low to High Speed

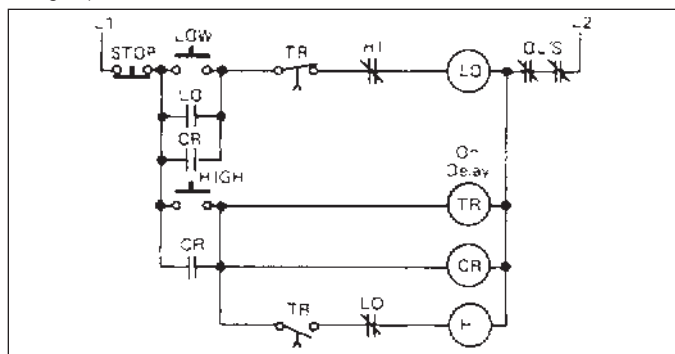


Figure 15 Control for Two Speed to Provide Automatic Deceleration from High to Low Speed

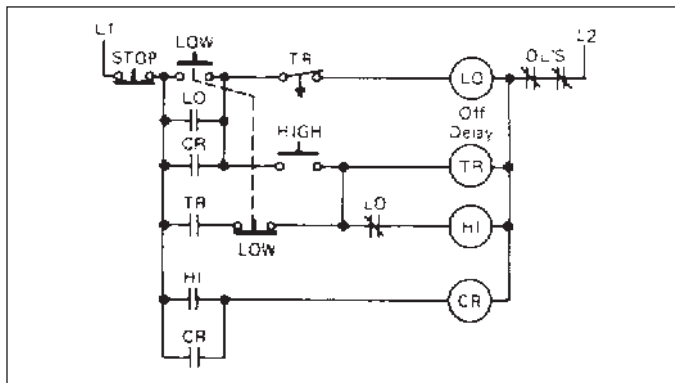
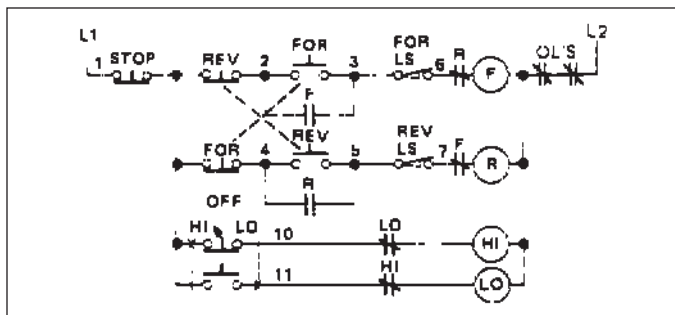
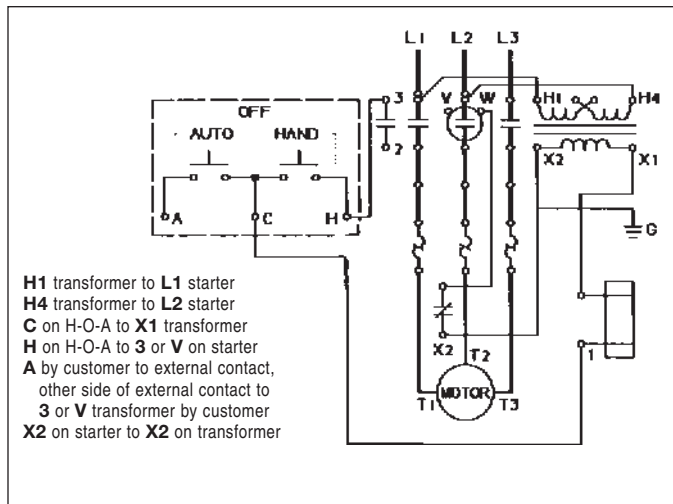


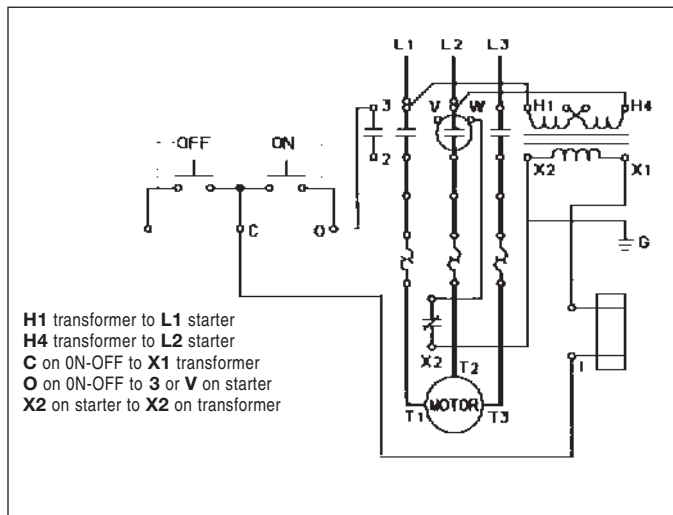
Figure 16 Control for Two Speed Reversing Starter Using Forward, Reverse, Stop Push Buttons and High-Low-Off Selector Switch



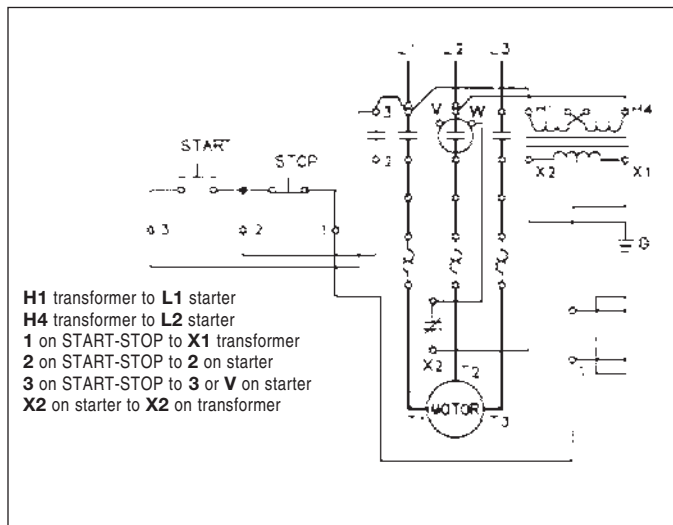
Size 0-2½ Starter with Transformer and 3 Position Selector Switch



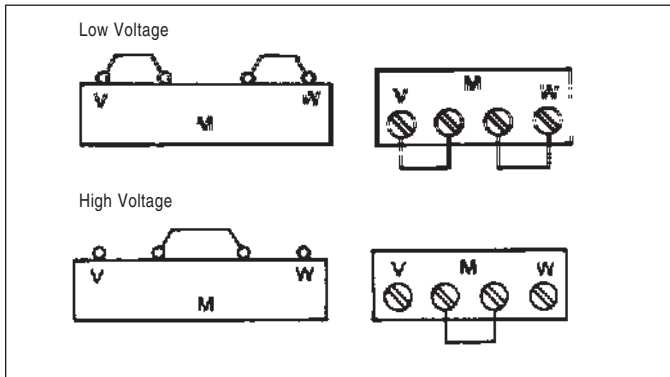
Size 0-2½ Starter with Transformer and 2 Position Selector Switch



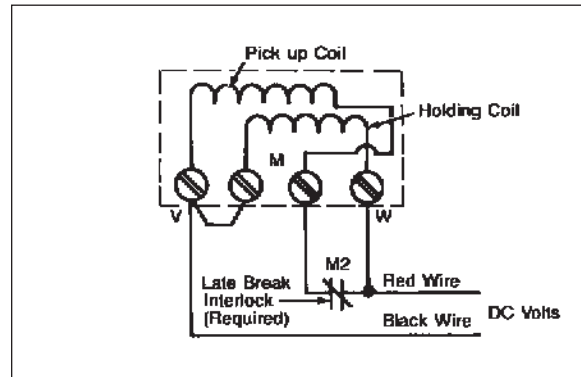
Size 0-2½ Starter with Transformer and START-STOP Push Button



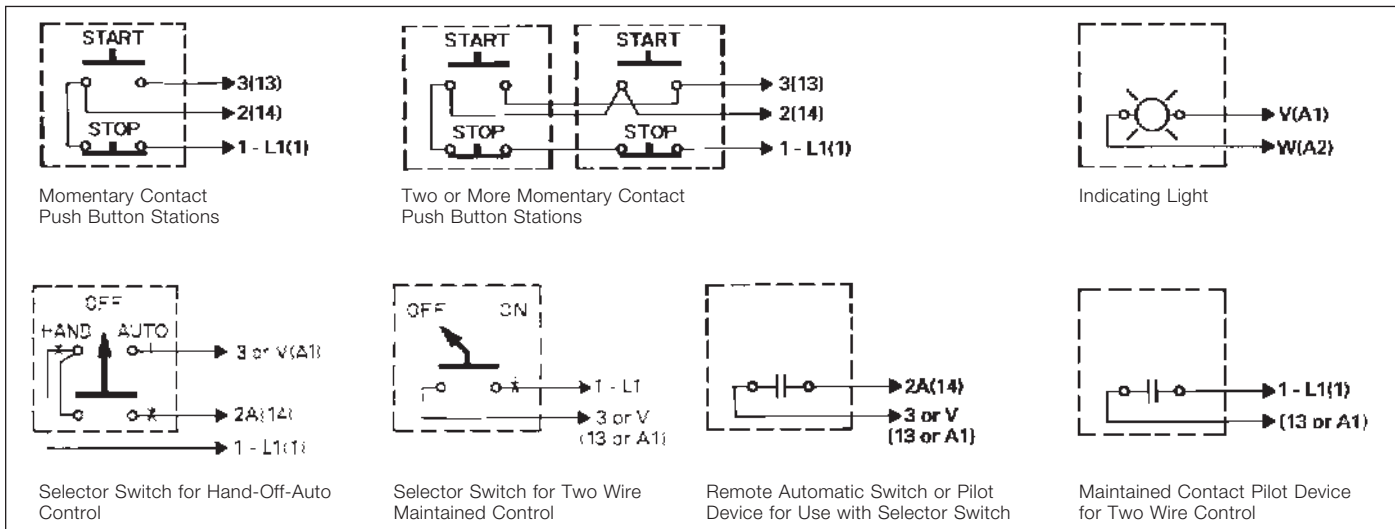
AC Coil—NEMA Size 0-4



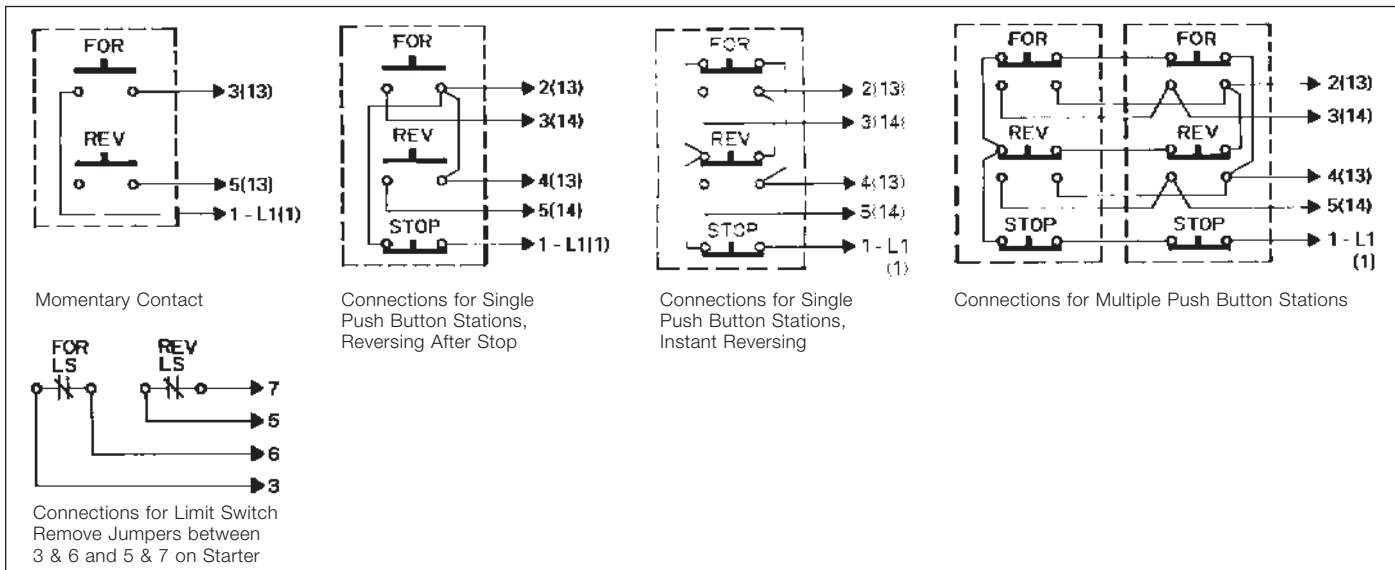
DC Coil—NEMA Size 0-4



Non Reversing Pilot Control Terminal Markings shown in () indicate IEC Style. For separate control voltage source remove Jumper A shown individual in wiring diagrams. Connect separate voltage source to terminal 1 on the pilot device as shown and to the terminal **X2** on the overload relay, or **W(A2)** on the coil if there is no overload.



Reversing Pilot Control For Separate control voltage source remove Jumper A shown in individual wiring diagrams. Connect separate voltage source to terminal 1 on the pilot device as shown and to the terminal **X2** on the overload relay, or **W(A2)** on the coil if there is no overload.



Appendix

International Control Equipment (IEC)

Quick reference list

Siemens is a manufacturer of equipment for the global market and manufactures products for global applications. The products listed in Sections 1 through 18 of this catalog are the products best suited for application in the U.S., Canada and Mexico.

There are a host of other Industrial Control products that can be made available for export applications or for replacement in OEM equipment imported in to the U.S. The most common Siemens components are listed in the table below. We refer to these as Industrial Control Equipment components or ICE products.

If you are trying to identify a Siemens ID that is not listed in the Catalog Number Index on pages 0/12 to 0/15 of this catalog or in the table below, please contact our Call Center at 800-241-4453 or 423-262-5700. The Siemens Call Center maintains an extensive data base on all Siemens Operating Companies, and they can direct you for the appropriate support.

Catalog Number Prefix	Description	Catalog Number Prefix	Description	Catalog Number Prefix	Description
2CC	Low-Pressure Axial Ventilator Fan	3WY3	3WN Accessories	4FL	Transformer Voltage Regulator
2CF7	Medium-Pressure Radial-flow Fan	4AC	Bell transformers, power supply units	4NC	Window-type Current Transformer
2CQ	Medium-Pressure Axial Ventilator Fan	4AJ	Standard Transformers	4PK	Reactance coils with layer winding of copper flat wire
2CT	Low-Pressure Axial Ventilator Fan	4AM	Control Transformer	5SA	DIAZED Fuse Links (E16) Miniature Fuses ¹⁾
3KA	Disconnect Switch	4AN	Single-phase transformers YUI 1 (UI)	5SB	DIAZED Fuse Links, Size II and III ¹⁾
3KE	Disconnect Switch	4AP	Transformer for rectifier operation	5SC	DIAZED Fuse Links, Size IV and V ¹⁾
3KL	Load Disconnect Switch w/Fuses	4AT	Safety Isolation Transformer, 1 phase	5SD	DIAZED Fuses
3KM	Load Disconnect Switch w/Fuses	4AU	Safety Isolation Transformer, 3 phase	5SE	Fuses ¹⁾
3KX	3KE4 Accessories	4AV	Special Transformers and DC power supplies	5SF	DIAZED Fuse Base
3KY	3KL Accessories	4AW	Ring core transformers	5SG	NEOZED & MINIZED Fuse Disconnectors
3NA	LV HRC Fuses	4AX	Non-Siemens transformers	5SH	DIAZED Fuse Accessories
3NC	SITOR Semiconductor fuse-links to 1000 V ¹⁾	4AY	Transformer housings, accessories and spare parts	5SM	Residual Current Protective Devices ¹⁾
3ND1	LV HRC Fuses	4BT	Transformer > 16 kVA, 1 Phase	5SQ	Miniature Circuit Breaker
3ND2	LV HRC Fuses	4BU	Transformer > 16 kVA, 3 Phase	5SU	Ground Fault and Line-Prot. Circuit Breaker
3NE	SITOR Semiconductor fuse-links to 2500 V ¹⁾	4BV	Special Transformers	5SV8	SFJ Fault and Line-Prot. Circuit Breaker
3NG1	LV HRC Fuses	4BX	Transformer, 3-phase	5SW	Wall Enclosure
3NH	Fuse Bases	4CH	Variac 1 Phase	5SZ	Ground Fault Circuit Breakers
3NJ	Fused Disconnect Switch	4CJ	Variac 3 Phase	5TE	Toggle Switch
3NP	Fused Disconnect Switch	4CP	Pillar-type, Variac, 1ph	5TG	Signal Light
3NW1	Fuse Material to BS and NF Standards ¹⁾	4CQ	Pillar-type, Variac, 3ph	5TT	Switch Relay
3NW6	Cylindrical Fuses	4EA	Reactance Coils with Iron-Core Reactors	7KM	Meters
3NW8	Fuse Material to BS and NF Standards	4EF	Reactance Coils with Iron-Core Reactors	7KT	Time meters, impulsing meters and accessories
3NX	Accessories and spare parts for NH-fuses	4EJ	Reactance Coils with Iron-Core Reactors	7LF	Digital time switches and accessories
3NY	3NP Accessories	4EM	Single-phase reactance coils YEI 1 (EI)	7LQ	Quarz-controlled time switches
3TK	Specialty Contactor	4EN9	Choke	7PV	Timers
3UL22	Summation Current Transformers	4EP	Line Reactor	7ZX	Instruction Manual ¹⁾
3VU2	Phase Out Announced	4ET	Single-phase reactance coils YUI 1 (UI)	8JH	Distribution Enclosure Accessories
3VX	Circuit Breaker Accessories and Components	4EU	Three-phase reactance coils YUI 2 (3UI)	8UB	Handle Accessories
3WX	3W Accessories	4EV	RFI Suppression Choke	8WC	Distribution System Accessories
3WY1	3WF Accessories	4FB	Power supplies	8ZX	Instruction Sheets ¹⁾
3WY2	3WE Accessories	4FK	Magnetic Voltage Regulator 1 phase	LZX	Plug-in Relays ¹⁾

1) Standard Control Product - Not Considered ICE Product.

Spring Loaded Terminals

As an alternative to screw-type terminals, many products may be supplied with spring loaded terminals. With this screwless connection technique, the wires are clamped securely against shock and vibration by a spring clamp. Solid, stranded and finely-stranded wires can be connected with or without end sleeves.

Each terminal connection is equipped with two independently operated spring clamps. Each spring can accept one wire. The clamping force of the spring automatically adjusts to the size of the wire and compensates for

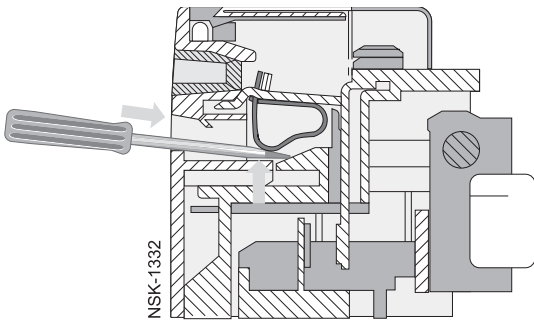
any deformation of the wire, such as settling of the strands. The flat clamping face of the spring presses the wire against the current bar without damaging the wire. To prevent stranded or finely-stranded wire from being divided, the end can be tinned or amalgamated using ultrasound.

The terminal is opened by inserting the screwdriver. The wire is then inserted and will remain clamped after the screwdriver is removed (see below). The chromium-nickel steel of the spring clamp provides corrosion-resistant contact of the wire-end in the clamp.

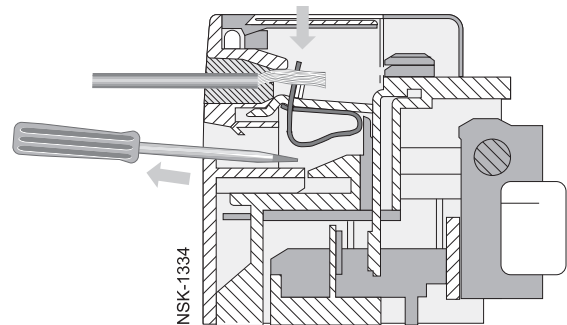
Advantages:

- Quick: The connection is made easily without the need to add on wire end sleeves or torque down terminal screws—reducing wiring time
- Reliable: The terminal is gas-tight and resistant to shock and vibration—for maximum contact reliability
- Maintenance-free: With the spring loaded terminals, there is no need to inspect the connections following transport—eliminating time-consuming and costly inspection

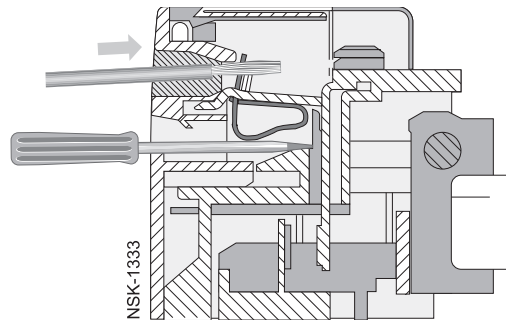
Step 1:
Insert screwdriver;
spring opens.



Step 2:
The screwdriver holds the spring open;
insert the wire.



Step 3:
Remove the screwdriver; the spring
closes and the wire is securely clamped.



Appendix

Siemens Industry, Inc. (Seller)

Standard terms and conditions of sale

1. APPLICABLE TERMS. These terms govern the sale of Products by Siemens. Whether these terms are included in an offer or an acceptance by Siemens, such offer or acceptance is conditioned on Buyer's assent to these terms. Any additional, different or conflicting terms contained in Buyer's request for proposal, specifications, purchase order or any other written or oral communication from Buyer shall not be binding in any way on Siemens. Siemens failure to object to any such additional, different or conflicting terms shall not operate as a waiver of these terms.

2. PRICING & PAYMENT. The prices shall be: (a.) as stated in Siemens' proposal, or if none are stated, (b.) Siemens' standard prices in effect at the time of release for shipment. In the event of a price increase or decrease, the price of Products on order shall be adjusted to reflect such increase or decrease. This does not apply to a shipment held by request of Buyer. Products already shipped are not subject to price increase or decrease.

Discounts, if any, are as specified on the latest discount sheets issued from time to time. Cash discounts are not applicable to notes or trade acceptances, to pre-paid transportation charges when added to Siemens' invoices or to discountable items if there are undisputed past due items on the account. Cash discounts shall only be allowed on that portion of the invoice paid within the normal discount period.

(a) Payment - Unless otherwise stated, all payments shall be net 30 days from invoice date payable in United States Dollars.

(b) Credit Approval - All orders are subject to credit approval by Siemens. The amount of credit or terms of payment may be changed or credit withdrawn by Siemens at any time for any reason without advance notice. Siemens may, in its discretion, withhold further manufacture or shipment; require immediate cash payments for past and future shipments; or require other security satisfactory to Siemens before further manufacture or shipment is made; and may, if shipment has been made, recover the Products from the carrier, pending receipt of such assurances.

(c) Installment Shipment - If these terms require or authorize delivery of Products in separate shipments to be separately accepted by Buyer, Buyer may only refuse such portion of such shipment that fails to comply with the requirements of these terms. Buyer may not refuse to receive any lot or portion of hereunder for failure of any other lot or portion of a lot to be delivered or to comply with these terms, unless such right of refusal is expressly provided for on the face hereof. Buyer shall pay for each lot in accordance with the terms hereof. Payment shall be made for the Products without regard to whether Buyer has made or may make any inspection of the Products. Products held for Buyer are at Buyer's sole risk and expense.

(d) Taxes, Shipping, Packing, Handling - Except to the extent expressly stated in these terms, Siemens' prices do not include any freight, storage, insurance, taxes, excises, fees, duties or other government charges related to the Product, and Buyer shall pay such amounts or reimburse Siemens for any amounts Siemens pays. If Buyer claims a tax or other exemption or direct payment permit, it shall provide Siemens with a valid exemption certificate or permit and indemnify, defend and hold Siemens harmless from any taxes, costs and penalties arising out of same. Siemens' prices include the costs of its standard domestic packing only. Any deviation from this standard packing (domestic or export), including U.S. Government sealed packing, shall result in extra charges. To determine such extra charges, consult Siemens' sales offices. Any and all increases, changes, adjustments or surcharges (including, without limitation, fuel surcharges) which may be in connection with the freight charges, rates or classification included as part of these terms, shall be for the Buyer's account. Orders of less than \$400 are subject to a \$25 handling fee.

(e) Finance Charge - Buyer agrees to pay FINANCE CHARGES on the unpaid balance of all overdue invoices, less any applicable payments and credits, from the date each invoice is due and payable at an ANNUAL PERCENTAGE RATE of EIGHTEEN PERCENT (18%), or the highest applicable and lawful rate on such unpaid balance, whichever is lower.

(f) Disputed Invoice - In the event Buyer disputes any portion or all of an invoice, it shall notify Siemens in writing of the amount in dispute and the reason for its disagreement within 21 days of receipt of the invoice. The undisputed portion shall be paid when due, and FINANCE CHARGE on any unpaid portion shall accrue, from the date due until the date of payment, to the extent that such amounts are finally determined to be payable to Siemens.

(g) Collection - Upon Buyer's default of these terms, Siemens may, in addition to any other rights or remedies at contract or law, subject to any cure right

of Buyer, declare the entire balance of Buyer's account immediately due and payable or foreclose any security interest in Products delivered. If any unpaid balance is referred for collection, Buyer agrees to pay Siemens, to the extent permitted by law, reasonable attorney fees in addition to all damages otherwise available, whether or not litigation is commenced or prosecuted to final judgment, plus any court costs or expenses incurred by Siemens, and any FINANCE CHARGES accrued on any unpaid balance owed by Buyer.

3. DELIVERY; TITLE; RISK OF LOSS. Product shall be delivered F.O.B. Siemens point of shipment with title to the Product and risk of loss or damage for the Product passing to Buyer at that point. Buyer shall be responsible for all transportation, insurance and related expenses including any associated taxes, duties or documentation. Siemens may make partial shipments. Shipping dates are approximate only and Siemens shall not be liable for any loss or expense (consequential or otherwise) incurred by Buyer or Buyer's customers if Siemens fails to meet the specified delivery schedule. A 5% handling charge will be added to the price for all Product furnished from a local branch.

4. DEFERMENT AND CANCELLATION. Buyer shall have no deferment rights and Buyer shall be liable for cancellation charges, which shall include without limitation a) payment of the full product price for any finished Product or works in progress; b) payment for raw materials ordered pursuant to a firm purchase order; and c) such other direct costs incurred by Siemens as a result of such cancellation.

5. FORCE MAJEURE / DELAYS. If Siemens suffers delay in performance due to any cause beyond its reasonable control, including without limitation acts of God, strikes, labor shortage or disturbance, fire, accident, war or civil disturbance, delays of carriers, failure of normal sources of supply, or acts of government, the time of performance shall be extended a period of time equal to the period of the delay and its consequences. Siemens will give to Buyer notice within a reasonable time after Siemens becomes aware of any such delay

6. BUYER'S REQUIREMENTS. Timely performance by Siemens is contingent upon Buyer's supplying to Siemens all required technical information and data, including drawing approvals, and all required commercial documentation.

7. LIMITED WARRANTY. (a.) Limited Product Warranty Statements. For each Product purchased from Siemens or an authorized reseller, Siemens makes the following limited warranties: (i) the Product is free from defects in material and workmanship, (ii) the Product materially conforms to Siemens' specifications that are attached to, or expressly incorporated by reference into, these terms, and (iii) at the time of delivery, Siemens has title to the Product free and clear of liens and encumbrances (collectively, the "Limited Warranties"). Warranties with respect to software which may be furnished by Seller as part of the Product, if any, are expressly set forth elsewhere in these terms. The Limited Warranties set forth herein do not apply to any software furnished by Siemens. If software is furnished by Siemens, then the attached Software License/Warranty Addendum shall apply.

(b.) Conditions to the Limited Warranties. The Limited Warranties are conditioned on (i) Buyer storing, installing, operating and maintaining the Product in accordance with Siemens' instructions, (ii) no repairs, modifications or alterations being made to the Product other than by Siemens or its authorized representatives, (iii) using the Product within any conditions or in compliance with any parameters set forth in specifications that are attached to, or expressly incorporated by reference into, these terms, (iv) Buyer discontinuing use of the Product after it has, or should have had, knowledge of any defect in the Product, (v) Buyer providing prompt written notice of any warranty claims within the warranty period described below, (vi) at Siemens' discretion, Buyer either removing and shipping the Product or non-conforming part thereof to Siemens, at Buyer's expense, or Buyer granting Siemens access to the Products at all reasonable times and locations to assess the warranty claims, and (vii) Buyer not being in default of any payment obligation to Siemens under these terms.

(c.) Exclusions from Limited Warranty Coverage. The Limited Warranties specifically exclude any equipment comprising part of the Product that is not manufactured by Siemens or not bearing its nameplate. To the extent permitted, Siemens hereby assigns any warranties made to Siemens for such equipment. Siemens shall have no liability to Buyer under any legal theory for such equipment or any related assignment of warranties. Additionally, any Product that is described as being experimental, developmental, prototype, or pilot is specifically excluded from the Limited Warranties and is provided to Buyer "as is" with no warranties of any kind. Also excluded from the Limited Warranties are normal wear and tear items including any expendable items that comprise part of the Product, such as fuses and light bulbs and lamps.

(d.) Limited Warranty Period. Buyer shall have 12 months from initial operation of the Product or 18 months from shipment, whichever occurs first, to provide Siemens with prompt, written notice of any claims of breach of the Limited Warranties. Continued use or possession of the Product after expiration of the warranty period shall be conclusive evidence that the Limited Warranties have been fulfilled to the full satisfaction of Buyer, unless Buyer has previously provided Siemens with notice of a breach of the Limited Warranties.

(e.) Remedies for Breach of Limited Warranty. Buyer's sole and exclusive remedies for any breach of the Limited Warranties are limited to Siemens' choice of repair or replacement of the Product, or non-conforming parts thereof, or refund of all or part of the purchase price. The warranty on repaired or replaced parts of the Product shall be limited to the remainder of the original warranty period. Unless otherwise agreed to in writing by Siemens, (i) Buyer shall be responsible for any labor required to gain access to the Product so that Siemens can assess the available remedies and (ii) Buyer shall be responsible for all costs of installation of repaired or replaced Products. All exchanged Products replaced under this Limited Warranty will become the property of Siemens.

(f.) Transferability. The Limited Warranties shall be transferable during the warranty period to the initial end-user of the Product.

THE LIMITED WARRANTIES SET FORTH IN THIS SECTION ARE SIEMENS' SOLE AND EXCLUSIVE WARRANTIES AND ARE SUBJECT TO THE LIMITS OF LIABILITY SET FORTH IN SECTION 8 BELOW. SIEMENS MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, COURSE OF DEALING AND USAGE OF TRADE.

8. LIMITATION OF LIABILITY. NEITHER SIEMENS, NOR ITS SUPPLIERS, SHALL BE LIABLE, WHETHER IN CONTRACT, WARRANTY, FAILURE OF A REMEDY TO ACHIEVE ITS INTENDED OR ESSENTIAL PURPOSES, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, INDEMNITY OR ANY OTHER LEGAL THEORY, FOR LOSS OF USE, REVENUE, SAVINGS OR PROFIT, OR FOR COSTS OF CAPITAL OR OF SUBSTITUTE USE OR PERFORMANCE, OR FOR INDIRECT, SPECIAL, LIQUIDATED, PUNITIVE, EXEMPLARY, COLLATERAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR FOR ANY OTHER LOSS OR COST OF A SIMILAR TYPE, OR FOR CLAIMS BY BUYER FOR DAMAGES OF BUYER'S CUSTOMERS. SIEMENS' MAXIMUM LIABILITY UNDER THIS CONTRACT SHALL BE THE ACTUAL PURCHASE PRICE RECEIVED BY SIEMENS FOR THE PRODUCT AT ISSUE OR ONE MILLION DOLLARS, WHICHEVER IS LESS. BUYER AGREES THAT THE EXCLUSIONS AND LIMITATIONS SET FORTH IN THIS ARTICLE ARE SEPARATE AND INDEPENDENT FROM ANY REMEDIES WHICH BUYER MAY HAVE HEREUNDER AND SHALL BE GIVEN FULL FORCE AND EFFECT WHETHER OR NOT ANY OR ALL SUCH REMEDIES SHALL BE DEEMED TO HAVE FAILED OF THEIR ESSENTIAL PURPOSE. THESE LIMITATIONS OF LIABILITY ARE EFFECTIVE EVEN IF SIEMENS HAS BEEN ADVISED BY THE BUYER OF THE POSSIBILITY OF SUCH DAMAGES.

9. PATENT AND COPYRIGHT INFRINGEMENT. Siemens will, at its own expense, defend or at its option settle any suit or proceeding brought against Buyer in so far as it is based on an allegation that any Product (including parts thereof), or use thereof for its intended purpose, constitutes an infringement of any United States patent or copyright, if Siemens is promptly provided notice and given authority, information, and assistance in a timely manner for the defense of said suit or proceeding. Siemens will pay the damages and costs awarded in any suit or proceeding so defended. Siemens will not be responsible for any settlement of such suit or proceeding made without its prior written consent. In case the Product, or any part thereof, as a result of any suit or proceeding so defended is held to constitute infringement or its use by Buyer is enjoined, Siemens will, at its option and its own expense, either: (a) procure for Buyer the right to continue using said Product; (b) replace it with substantially equivalent non-infringing Product; or (c) modify the Product so it becomes non-infringing.

Siemens will have no duty or obligation to Buyer under this Article to the extent that the Product is (a) supplied according to Buyer's design or instructions wherein compliance therewith has caused Siemens to deviate from its normal course of performance, (b) modified by Buyer or its contractors after delivery, (c) combined by Buyer or its contractors with devices, methods, systems or processes not furnished hereunder and by reason of said design, instruction, modification, or combination a suit is brought against Buyer. In addition, if by reason of such design, instruction, modification or combination, a suit or proceeding is brought against Siemens, Buyer shall protect Siemens in the same manner and to the same extent that Siemens has agreed to protect Buyer under the provisions of the Section above.

THIS ARTICLE IS AN EXCLUSIVE STATEMENT OF ALL THE DUTIES OF THE PARTIES RELATING TO PATENTS AND COPYRIGHTS, AND DIRECT OR CONTRIBUTORY PATENT OR COPYRIGHT AND OF ALL THE REMEDIES OF BUYER RELATING TO ANY CLAIMS, SUITS, OR PROCEEDINGS INVOLVING PATENTS AND COPYRIGHTS.

10. COMPLIANCE WITH LAWS. Buyer agrees to comply with all applicable laws and regulations relating to the purchase, resale, exportation, transfer, assignment, disposal or use of the goods.

11. CHANGES IN WORK. Siemens shall not implement any changes in the scope of work unless Buyer and Siemens agree in writing to the details of the change and any resulting price, schedule or other contractual modifications. Any change to any law, rule, regulation, order, code, standard or requirement which requires any change hereunder shall entitle Siemens to an equitable adjustment in the prices and any time of performance.

12. NON-WAIVER OF DEFAULT. Each shipment made hereunder shall be considered a separate transaction. In the event of any default by Buyer, Siemens may decline to make further shipments. If Siemens elects to continue to make shipments, Siemens' actions shall not constitute a waiver of any default by Buyer or in any way affect Siemens' legal remedies for any such default. Any waiver of Siemens to require strict compliance with the provisions of this contract shall be in writing and any failure of Siemens to require such strict compliance shall not be deemed a waiver of Siemens' right to insist upon strict compliance thereafter.

13. FINAL WRITTEN AGREEMENT; MODIFICATION OF TERMS. These terms, together with any quotation, purchase order or acknowledgement issued or signed by Siemens, comprise the complete and exclusive agreement between the parties (the "Agreement") and supersede any terms contained in Buyer's documents, unless separately signed by Siemens. These terms may only be modified by a written instrument signed by authorized representatives of both parties.

14. ASSIGNMENT. Neither party may assign the Agreement, in whole or in part, nor any rights or obligations hereunder without the prior written consent of the other; provided however that Siemens may assign its rights and obligations under these terms to its affiliates and Siemens may grant a security interest in the Agreement and/or assign proceeds of the Agreement without Buyer's consent.

15. APPLICABLE LAW AND JURISDICTION. These terms are governed and construed in accordance with the laws of the State of Delaware, without regard to its conflict of laws principles. The application of the United Nations Convention on Contracts for the International Sale of Goods is excluded. BUYER WAIVES ALL RIGHTS TO A JURY TRIAL IN ANY ACTION OR PROCEEDING RELATED IN ANY WAY TO THESE TERMS.

16. SEVERABILITY. If any provision of these terms is held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions will not in any way be affected or impaired, and such provision will be deemed to be restated to reflect the original intentions of the parties as nearly as possible in accordance with applicable law.

17. EXPORT COMPLIANCE. Buyer acknowledges that Siemens is required to comply with applicable export laws and regulations relating to the sale, exportation, transfer, assignment, disposal, and usage of the Products provided under the Contract, including any export license requirements. Buyer agrees that such Products shall not at any time directly or indirectly be used, exported, sold, transferred, assigned or otherwise disposed of in a manner which will result in non-compliance with such applicable export laws and regulations. It shall be a condition of the continuing performance by Siemens of its obligations hereunder that compliance with such export laws and regulations be maintained at all times. BUYER AGREES TO INDEMNIFY AND HOLD SIEMENS HARMLESS FROM ANY AND ALL COSTS, LIABILITIES, PENALTIES, SANCTIONS AND FINES RELATED TO NON-COMPLIANCE WITH APPLICABLE EXPORT LAWS AND REGULATIONS.

Notes

A close-up photograph of a Siemens SIRIUS 3RM1 Motor Starter. The device is a narrow, grey, modular unit mounted on a DIN rail. It features several blue and red wires connected to its top. A hand is shown adjusting a yellow terminal block on the right side of the unit. The unit has multiple status indicators (LEDs) and a small rotary switch. The Siemens logo is visible on the top of the unit.

SIEMENS

Start-up with a small footprint – the SIRIUS 3RM1 Motor Starter

The SIRIUS 3RM1 Motor Starter –
multifunctional with a width of just 22.5 mm

www.usa.siemens.com/3RM1

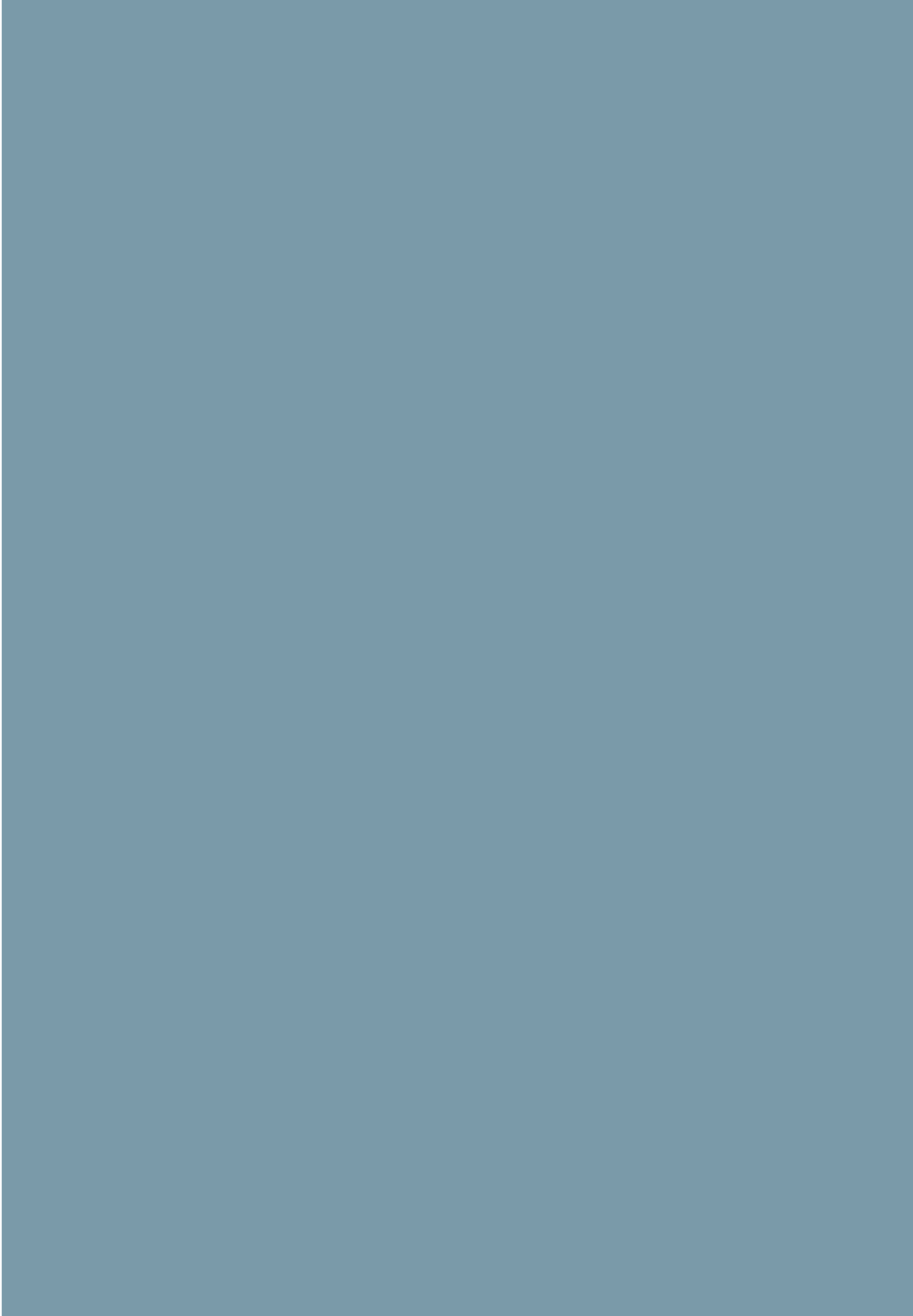
The new SIRIUS 3RM1 motor starters are distinguished by their narrow width of just 22.5 mm. That saves room in the control cabinet and provides the ideal conditions for systems and machines with small motors up to 3 HP. The 3RM1 starters are available as direct or reversing starters, all in a uniform housing design. Every motor starter is equipped with integrated electronic overload protection—you no longer need a separate overload relay. The result is lower wiring costs, shorter installation time, and more room on the DIN rail. To meet the requirements for safe shutdowns, SIRIUS 3RM1 Motor Starters are rated up to SIL 3, PL e and Cat 4. Using the 3RM1 starters with the 3SK1 modular safety relay system provides additional reductions in control wiring.

See Section 6 of this catalog.



product
design award

2013



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